In The Matter Of:

APPLE COMPUTER v.
BURST.COM

SHEILA HEMAMI
November 14, 2006

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA (SAN FRANCISCO)

APPLE COMPUTER, INC.,)
Plaintiff,)
-against-) Case No.
) C-06-00019
BURST.COM, INC.,) (MHP)
Defendant.)

DEPOSITION of SHEILA S. HEMAMI, PH.D., an Expert Witness, taken by Plaintiff at the offices of Weil, Gotshal & Manges LLP, 767 Fifth Avenue, New York, New York, on Tuesday, November 14, 2006, commencing at 9:28 a.m., before Charleane M. Heading, a Registered Professional Reporter and Notary Public within and for the State of New York.

APPEARANCES:

WEIL, GOTSHAL & MANGES LLP
Attorneys for Plaintiff
201 Redwood Shores Parkway
Redwood Shores, California 94065

BY: NICHOLAS A. BROWN, Esq., of Counsel

HEIM, PAYNE & CHORUSH, L.L.P.
Attorneys for Defendant
6710 Chase Tower
600 Travis Street
Houston, Texas 77002

BY: LESLIE V. PAYNE, Esq., of Counsel

ALSO PRESENT:

JOSE SANTOS, Videographer
Fink & Carney Reporting and Video

(Documents were premarked as Deposition Exhibit No. 101, 102, 103 and 104 for identification, as of this date.)

THE VIDEOGRAPHER: Now going on the record. The time is 9:28 a.m. on November 14, 2006.

This is the videotaped deposition of Sheila Hemami in the matter of Apple Computers, Inc. versus Burst.com, Inc. under the jurisdiction of the United States District Court, Northern Division of California. This deposition is being held at 767 Fifth Avenue, New York, New York.

My name is Jose Santos and I'm the video specialist. The court reporter is Charleane Heading and we both represent Fink & Carney Reporting with offices located at 39 West 37th Street, New York, New York.

May I have an introduction from counsel?

MR. BROWN: Nick Brown

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representing Apple Computer.
MR. PAYNE: Les Payne for Burst.
THE VIDEOGRAPHER: Will the court reporter swear in the witness?
SHEILA S. H EMAMI, called as a witness, having been first duly sworn by Charleane M. Heading, RPR, a Notary Public within and for the State of New York, was examined and testified as follows:

EXAMINATION BY MR. BROWN:

Q: Ms. Hemami, would you please state your full name for the record?
A: Sheila Susanne Hemami.
Q: And what's your current address?
A: 1010 North Cayuga Street, Ithaca, New York.
Q: And are you employed as an expert witness in this case?
A: Yes.
Q: Who is employing you?
A: The bills are being paid by Susman, Susman Godfrey.

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Q: And are you working on behalf of Burst.com?
A: I am.
Q: Have you had your deposition taken before?
A: Just once.
Q: And when was that?
A: I believe it was in February of 2003.
Q: Did you prepare for the deposition today?
MR. PAYNE: I caution the witness not to go into any communications with counsel which I understand, according to the protective order, are not discoverable but if you want to answer the question "yes" or "no," that's fine.
MR. BROWN: I think to clarify, Les, at least statements made by counsel that were relied upon in any way by the witness —
MR. PAYNE: Fair enough.
MR. BROWN: — are

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discoverable and I think, I don't want to agree with your characterization of the protective order but for the moment I'm happy with a "yes" or "no."
Q: Did you prepare for your deposition today?
A: Yes.
Q: And who did you meet with to prepare?
A: I prepared myself. I reviewed the materials in the reports. I guess that all constitutes the materials.
Q: Okay. Did you meet with anyone to prepare?
A: No.
Q: Okay. I'm going to go over the basic ground rules of a deposition since it's been a little while since you've last done one, but the fundamental rule is that I ask questions, you provide answers and the court reporter records both the questions and the answers.
Do you understand that that's happening?
A: Yes.

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Q: So it's helpful to the court reporter and the record if I try not to speak over you when you're talking and you pay me the same courtesy. Do you understand that?
A: Yes.
Q: If at any point you don't understand a question I'm asking, please ask me for clarification. Do you understand that?
A: Yes.
Q: And will you do that?
A: Yes.
Q: Okay. From time to time your, well, Burst's attorney, who is not your attorney, may interpose objections. Unless he instructs you not to answer a question, you still have to answer the question. Do you understand that?
A: Yes.
Q: If you have any questions at any point about what's happening or the proceedings, feel free to ask me and I will try to explain what's happening to you. Okay?
A: Okay.
Q: Let's just talk briefly about the work that you've done in the case so far.

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Have you met with Burst attorneys during the course of this case?
A: Yes.
Q: Who?
A: I have met with Les Payne, Floyd Chorush and Michael Heim, Heim, right, with an M.
Q: Have you met with any other Burst attorneys?
A: I guess I'm not sure.
Q: Okay. Have you met with other people?
A: Yes.
Q: Who else have you met with?
A: Well, there was an attorney, Micah Howe at Heim Payne & Chorush. I don't know if he — I don't know what makes somebody someone's attorney.
Q: Fair enough. Besides — do you understand that Micah Howe is an attorney?
A: I do understand that, yes.
Q: Okay. And you understand he works with the Heim Payne law firm?
A: I do understand that, yes.
Q: Okay. Have you met with anybody

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else in connection with this case?
A: No.
Q: In preparing the — well, you have Exhibit, I believe it's 78, in front of you?
A: Yes.
Q: Is that a copy of the expert report you prepared in this case?
A: It sure looks like it, yes.
Q: Well, why don't you flip through it and confirm that that is, in fact, the report in this case?
A: Yes, I think it is.
Q: Okay.
MR. PAYNE: We'll stipulate.
THE WITNESS: Thank you. I would not like to read it again.
MR. BROWN: Neither would I.
Q: Who, if anyone, did you meet with in preparing this report other than the attorneys that you've listed?
A: I did not meet with anyone in the preparing of this report. I did not meet with anybody other than attorneys during the time period which — actually, is that true?

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I didn't have any meetings with anybody while I prepared the report.
Q: Okay. What was the time frame during which you prepared Exhibit 78, your report in this case?
A: It was, it was about, it was September through October 20th.
Q: And when were you first retained in this case?
A: Okay. I know I'm not supposed to ask you questions, but what constitutes "retained"?
Q: Well, why don't we break it down? How did you first hear about this case?
A: I was, I was contacted by a Susman attorney.
Q: Do you remember approximately when?
A: That I don't remember, no.
Q: And in that conversation, did he tell you about the case?
MR. PAYNE: Well, let's hold on. I'm going to object.
Nick, I understand your

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interpretation of the protective order. Maybe we need to get on the same page here. I think we probably have the same understanding, but the way I read the protective order, communications between counsel and Dr. Hemami are not discoverable unless she relies on them in terms of preparing her opinion, opinions.
Is that how you interpret the protective order?
MR. BROWN: Well, I'd have to look at it again because I don't want to interpret it without —
MR. PAYNE: Well, I've got it right here, but it seems like you're asking her, you know, about a conversation she had with an attorney for Burst and I just don't think —
MR. BROWN: And I don't need to get into the conversation for purposes here. I'm trying to figure out when she was retained and what the timeline is.

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MR. PAYNE: That's fine.
MR. BROWN: I think you agree we can do that.
MR. PAYNE: That's fine.
Q: So —
A: Well, perhaps then I can provide you with information without having all this back and forth.
MR. PAYNE: Well, no. Let's let him ask the question and you answer the question and if I need to object, I will object.
MR. BROWN: I think I have a question that might solve the problem.
Q: Can you give me your understanding of how you came to be employed by Susman or Burst or whoever you understand yourself to be employed by in this case?
A: I was contacted like the day before I went to Greece in August and when I returned, we executed, I guess executed the paperwork to, what, I don't know, formally retain me. I don't know what the right way to word that is. I signed up. How's that?

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Q: Was that in August?
A: Yes.
Q: Approximately when?
A: Around the 14th. That was when I was contacted. Then I went to Greece. I came back around the 23rd.
Q: And you signed the paperwork around the 23rd. Is that right?
A: Some time after then, yes. Yes.
Q: Was it within a week of the 23rd?
A: Oh, sure.
Q: If you turn to tab — there's no tab, but I think there's an appendix A —
A: Yes.
Q: — which I think is page 66. Do you have that?
A: Yes.
Q: And spanning pages 66 to 78 in your expert report, which is appendix A, is what appears to be your CV. Is that right?
A: Yes.
Q: Is that, in fact, your CV?
A: Yes, at the time I submitted the report.

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Q: So appendix A of your, of Exhibit 78 was your CV as of October 20, 2006?
A: Yes.
Q: How regularly do you update it?
A: I update it very regularly because I simply can't keep track of all my papers otherwise.
Q: Is the information in your CV accurate to the best of your ability?
A: Now it's not, no. Effective sometime the week of Halloween, I was promoted to full professor so under the "Professional Experience," there should be, the "Associate Professor" line would terminate with "November 2000 to October 2006" and we would insert a line that said "Full Professor, School of Electrical & Computer Engineering, November 2006 to present."
Q: Congratulations.
A: Thank you. And there may be some papers which have changed status, but to be honest with you, the papers are, for the vast majority, accurate. I cannot remember if we've had any conference

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papers except — we have, between then and now.
Q: Let me try it slightly differently. Was the CV that's attached as appendix A to Exhibit 78 accurate as of the time you submitted your report in October of 2006?
A: I believe it was, yes.
Q: Okay. And you made your best efforts to ensure that that was true. Is that right?
A: Yes, yes.
Q: Now, you said earlier that you've testified in one deposition prior to now. Is that right?
A: That's correct.
Q: Was that in connection with a patent case?
A: It was not.
Q: What was it in connection with?
A: It pertained to the transmission of audio-visual information over satellites. It pertained to technical matters pertaining to the transmission of that information.
Q: Were you a fact witness or an expert witness in that case?

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A: To my understanding, I was an expert witness.
Q: Well, who were the parties to that case?
A: I was, I was, I guess, I don't know what the verb is, representing, retained by Pegasus. Let me get their name right here. It just says "Pegasus" here. Well, I think I was retained by Pegasus or —
Q: Are you looking at your CV?
A: Or — yes. Yes. You know, this case was sort of a mess and I was, I think I was retained by Pegasus. I was on the NRTC side.
Q: Okay. And what was the nature of the claims in the case?
A: Now I have an awkward question. Can I talk about this?
Q: I don't know.
A: I don't either.
MR. PAYNE: Well, are — let me, can I just voir dire about confidentiality or you can do it?
MR. BROWN: I think, why don't I do it?

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MR. PAYNE: Okay.
Q: I can tell you that except in extremely odd circumstances the complaints that are filed in a court are public documents. That's not always true in some very rare circumstances, but what I'm asking you is what the case was about. That's very likely to have been in the complaint.
A: Okay.
Q: So I'm fairly confident, regardless of the confidentiality agreement you had in the case, you can talk about the general nature of the case.
A: Okay. And I apologize for not having a better understanding.
Q: But having said that, let me ask you a question. Did you sign a confidentiality agreement in that case?
A: I'm sure I did, though I don't have a direct recollection of doing such a thing.
Q: Okay. Well, why don't you tell me the general nature of the case.
A: The satellites were jointly owned but operated by one of the parties. The owners

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who were not operating the satellites claimed that they could be operated in a different manner and the operator of the satellite claimed that they could not be operated in that different manner.
Q: And the case was about whether that was true?
A: Yes.
Q: Or at least your involvement was about that?
A: Yes. I believe there were many other pieces to the case but my involvement pertained to how the satellites could or could not be operated.
Q: Did you work in a case involving patents on the JPEG standard?
A: I did.
Q: Who were you retained by in that case?
A: In that case, I was retained by Forgent.
Q: And who were the attorneys that you worked with in that case?
A: Initially, the firm was Godwin Gruber. Then their name changed to Godwin Pappas

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and perhaps one other name associated with them. And then Susman Godfrey, I guess, took over. I'm not sure what the — somehow assumed the case.
Q: Which Susman Godfrey attorneys if any did you work with in connection with that case?
A: Steve Susman, Max Tribble and Tibor Nagy.
Q: Did you provide an expert report in that case?
A: I did.
Q: What was the subject matter addressed in the report?
A: The report was a, a claim construction report.
Q: So you've provided a claim construction expert report in this case and in the Forgent case. Is that true?
A: That's true.
Q: Have you provided a claim construction report in any other case?
A: I have not.
Q: Have you provided an expert report — well, let me ask you about the Pegasus

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case listed on your CV.
Did you provide an expert report in that case?
A: Yes.
Q: Were you deposed in that case?
A: Yes.
Q: I take it you were not deposed in the Forgent case. Is that correct?
A: That's correct.
Q: Other than this case, the Pegasus case and the Forgent case, have you provided expert reports in any cases?
A: No.
Q: Have you been retained in any cases other than those three cases?
A: Yes.
Q: Which cases?
A: I was retained in a case, I was retained by RealNetworks in a case where some individuals were alleging patent infringement against RealNetworks and I was also retained in a case, another case involving Forgent and I was retained by Forgent.
Q: Was the other case involving Forgent

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a patent case?
A: Yes.
Q: Do you remember who the other parties to that case were?
A: The only one I remember definitively is — and now that I say that I have to question. It could be EchoStar but let me say could be. I don't want to rely on my memory right now for that.
Q: Okay. Do you keep a record of the expert witness work that you have done?
A: Do I keep a record?
Q: Right.
A: No.
Q: You said you didn't want to rely on your memory. Was there something else that you could rely on?
A: For that case, no. No.
Q: So we now have Pegasus, two cases for Forgent, RealNetworks and the current case.
A: Yes.
Q: Are there any other cases in which you've been retained as an expert witness?
A: No.

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Q: And all of those five cases except the Pegasus case are patent cases. Is that right?
A: Yes.
Q: Why is it that in your CV when you have the heading, "Other Expert Witness Consulting in the Past 4 Years," you only list the Pegasus case and not those other cases that we just discussed?
A: The RealNetworks case was not in the past four years and my understanding of this category was it involved giving testimony and that's the only case in which I gave any testimony.
Q: So the, what you meant by this heading was other expert witness testimony in the past four years. Is that right?
A: I think that what you have stated is more correct.
Q: Do you have a copy of the expert report that you provided in the Forgent case?
A: Yes.
MR. BROWN: Les, I'd like to get a copy of that report if that's possible.

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MR. PAYNE: Let me check into confidentiality issues and I'll ask the same of Mr. Halpern's reports —
MR. BROWN: That's fine.
MR. PAYNE: — to get those.
MR. BROWN: We'll check the same thing.
Q: I'd like to ask you to turn to page 26 of your expert report. There's a heading there which reads, "The Level of Ordinary Skill in the Art." Do you see that?
A: Yes.
Q: Actually, before we keep going, I want you, if you need to in the course of answering my questions, to read whatever you need to read to answer the question. I'll try to direct you to the part that I'm asking you questions about and right now, I'm going to ask you some questions about ordinary skill.
So please feel free to read whatever you need to read in order to answer my questions as accurately as possible. Will you do that?
A: Okay. Do you want me to do that now or whenever?

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Q: That's completely up to you. All right?
A: Okay.
Q: What I'd like you to do is listen to my question and if you think you need to read something, go ahead and read it. Okay?
Do you understand — well, if you turn to the next page, there's a section 4, "The Meaning of Specific Claim Terms." Do you see that?
A: Yes.
Q: And then following that you provide opinions about the meaning of claim terms in the Burst patents. Is that right?
A: Yes.
Q: And when I say, "the Burst patents," you understand those are Exhibits 1 through 4 which are in front of you?
A: Yes.
Q: So you've provided opinions of the meaning of certain claim terms at least in the Burst patents. Is that right?
A: Yes.
Q: And when you did that, did you

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understand that you were providing an opinion about how those terms would be understood by a person of ordinary skill in the art?
A: Yes.
Q: In your expert report, in section 3, which is titled, "The Level of Ordinary Skill in the Art," did you describe your understanding of a person of ordinary skill in the art that pertains to the Burst patents?
A: Yes.
Q: Was that the understanding that you used when you were providing the opinions in section 4 of your report?
A: Yes.
Q: The second paragraph — well, actually, let's start with the first paragraph.
You state in the first paragraph that, "A person of ordinary skill in the art at the time of the patent application leading to the '995 patent was filed would have had an understanding of, one, digital communication technologies and their available bandwidths and, two, audio and/or video compression techniques."
Do you see that?

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A: Yes.
Q: Are those the two areas that you believe the Burst patents relate to?
A: Yes.
Q: In the second paragraph, you state that, "A person of ordinary skill in the art would work in the area of digital communication of audio/video source information." Do you see that?
A: Yes.
Q: Is that an accurate description of the area of the Burst patents in your opinion?
A: Yes.
Q: And you then say, "A person in this area could be specialized in digital communications having a familiarity with compression technology, or such a person could be specialized in compression technology having a familiarity with digital communications."
Do you see that?
A: Yes.
Q: Are you one of those people?
A: Yes.
Q: Which one?
A: I fall in the second category.

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Q: Is it fair to say, then, that you are specialized in compression technology and that you have a familiarity with digital communications?
A: Yes.
Q: You then in the next two paragraphs provide what appears to me to be a sliding scale of education and experience as the minimum level for ordinary skill, skill in the art. So with a Bachelor's degree, you state that you would need two to three years of experience. Do you see that?
A: Yes.
Q: And then if you have a Ph.D., it appears to be your opinion that you, at that point, don't need any actual work experience in that area. Is that right?
A: I would disagree with your characterization of "work experience."
Q: Please explain.
A: Perhaps you can clarify "work experience."
Q: Sure.
A: Because I interpreted it in some

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manner.
Q: Well, you write here that if you —
you give two paragraphs at the end of this section
which describe what level of education and
experience you need to be a person of ordinary
skill in the art. Is that true?
A: That is true.
Q: And one of the examples you provide
is someone with a Bachelor's degree in electrical
engineering with at least — I think there's a
typo there — two to three years of experience
working on digital communication of audio/video
source information. Is that right?
A: Yes.
Q: And then you provide another
alternative which is a Master's degree with one
year of experience working. Do you see that?
A: Yes.
Q: And then you provide another
alternative which is a person with a Ph.D. degree
and you don't say anything about experience
working. Do you see that?
A: Yes.
Q: It seems that you're trying to

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describe a sliding scale where as your educational
level increases, your number of years working
experience decreases. Is that right?
A: Well, so I guess I didn't use the
word "working" here.
Q: Well, you actually did. You said,
"One year of experience working on digital
communication of audio/video source information."
A: Yes, okay.
Q: Right?
A: I suppose working —
Q: And then above —
A: I believe your initial question was
"work experience."
My characterization —
MR. PAYNE: Is there a
question on the table?
MR. BROWN: I think there is.
MR. PAYNE: Okay.
Q: Which is did you use a sliding scale
balancing experience working against educational
level?
A: In fact, I would say this is a, sort
of a constant scale in that having a Ph.D. in

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electrical engineering in the area of digital
communication of audio/video information
essentially includes years of experience working
on exactly doing that. So, whereas somebody with
a Bachelor's degree having had four years of
education, if I simply state Bachelor's degree,
that does not include any experience working.
The Ph.D. includes the working
experience. So perhaps you could view it as a
constant level where the delineation between the
terminal degree and the current level simply
moves.
Q: So in your view, there needs, one
needs to have experience working on digital
communication of audio/video source information.
Is that right?
It's just that in the case of a
Ph.D., you get that during the course of your
Ph.D.?
A: One would have experience with
digital communication technologies and some amount
of audio and/or video compression techniques.
Q: Would it be possible, in your view,
to have ordinary skill in the art of the Burst

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patents without a formal technical degree if one
had sufficient experience?
A: Yes.
Q: Can you describe the nature of the
experience that you think would be required in
that case?
A: So I have in mind a, somebody of the
nature of experience in, I guess, what we would
generally call video engineering, so perhaps
somebody who's experienced in broadcasting or
developing, say, videoconferencing material.
Another example might be worked at
NASA. NASA did a tremendous amount of
transmitting, not audio — well, let me not say
not audio, I don't know that, but certainly visual
information over great distances. And you know,
clearly in 1988 the, shall we say the digital
revolution was, was coming and had arrived for
much of certainly audio and video and visual
information.
So for the technically curious, as a
word for nerdy or geeky video engineer, they would
certainly stay on top of these developments and be
following them with great interest.

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Q: Can you give me a rough number about the number of years of experience that you think you would need if you didn't have a formal technical degree?

A: No, because that depends on, to some extent the, how quickly an individual can pick up material, how interested they are, you know, whether it's a, they spend two hours a day on it or they immerse themselves in an immersive environment. I don't think that there's a, I don't think there's a recipe that, at the point after which we award them the label of, of having tremendous expertise.

Q: Okay. Let's change the focus to you for just a moment.

I think you said before that you viewed yourself as specialized in compression technology but also having a familiarity with digital communications. Is that right?

A: That's correct.

Q: And you have a Ph.D. in electrical engineering, correct?

A: I do.

Q: So you, yourself, qualify as a

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person of ordinary skill in the art or perhaps I should say at least ordinary skill in the art under the definition you provided here. Is that right?

A: Yes.

Q: Okay. You were present at the deposition of Mr. Halpern yesterday, correct?

A: Yes.

Q: And you were present when he testified about his experience and qualifications, correct?

A: Yes.

Q: And you'll recall that he has a Bachelor's degree in mathematics, correct?

A: Yes.

Q: And then he has work experience following that, correct?

A: Yes.

Q: If you — would you agree that he has a specialty in digital communications?

A: No.

Q: Okay. Why not?

A: Based on what he described — or how can I put this? Based on the responses and

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explanations that I heard him state yesterday, as well as what is in his report, I believe that I would label him as more of a networking expert as opposed to a digital communications expert.

Q: And what's the difference in your mind between networking and digital communications?

A: Digital communications classically is, it's a larger topic and includes what we would say, in communications parlance, the physical layer and multiple access techniques.

The physical layer includes, for example, if one is posed with the problem of wanting to get digital information from your office here to your office in Palo Alto, how would you physically do that. You know, one option is for you to carry a CD-ROM back with you on the airplane but there are other mechanisms by which you could transmit over a certain frequency range to a satellite. You could transmit over specific cables, electrical versus electromagnetic signalling.

What are the characteristics of those various signalling media? If we choose to

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transmit your information by relaying it through a satellite, how error-prone is it going to be, what are the delays going to be, is the propagation delay an issue.

I view networking as sitting up from the physical layer. The networking does not necessarily care how the bits get from point A to point B, whether you routed them through a satellite or through a copper wire.

What it does care about is what protocols were used to enable that communication, how did you deal with the delays, was there traffic. A network is generally interconnection of entities, perhaps even interconnection of many networks and networking addresses how the operation of that unit, above the physical layer, not so much what particular circuit is toggling whatever signal on the, the channel is being sensed at the other end. It's beyond that.

It doesn't care how the bit got from point A to point B. It just needs to know that the bit got there with its, whatever assorted information it had to come with.

Q: So as I understand what you said,

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there's a physical layer and there's a networking layer at a higher level of abstraction than the physical layer. Is that right?

A: I think that's an accurate description of what I had just said.

Q: Okay. You used the phrase "digital communications" here.

A: Yes.

Q: Does digital communications, as you used it, include both the physical layer and the networking layer or one or what?

A: That depends on whose perspective we are —

Q: Okay. I want to — I don't mean to interrupt you, but I want to try to keep us on track.

So what I'm concerned is the area of the Burst patents and you've testified that the areas of the Burst patents is, as you've set forth here, digital communication of audio/video source information.

So the perspective I'm interested in is what's included in digital communication when you're using that phrase to describe the field of

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the Burst patents?

A: Okay. Excellent question and I understand your question.

With respect to the field of the Burst patents, digital communications and networking can simply be lumped into the — let me select my word here — the mechanism by which the material is transmitted. So the Burst patents, we see transmission away, discussion of transmission between units or relayed through, through a satellite.

As far as the Burst patents are concerned, I guess going back to my layered hierarchy, this unit sits very high up in the view of what's — it doesn't care so much what's going on, the mechanisms, the nitty gritty issues of what's going on underneath it.

As far as the unit is concerned, the bits are just bits that it can transmit out and receive in. How they got from point A to point B, in terms of the physical layer, the network, whether there was a multiple access technique involved, is irrelevant.

Q: You wrote here in your report, "A

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person in this area could be specialized in digital communications, having a familiarity with compression technology."

When you wrote that, did you, were you trying to exclude someone with a specialty in only networking or exclude someone with a specialty in only the physical layer?

A: I don't believe so.

Q: So if you have experience in at least networking or at least the physical layer for digital communication, that would qualify, either one of those would qualify under what you wrote here as digital communications. Is that right?

A: Well, in conjunction with the compression knowledge —

Q: Sure.

A: — yes.

Q: So the next part of your sentence says, "having a familiarity with compression technology," right?

A: Yes.

Q: And that's what you were referring to?

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A: Yes.

Q: But for the part where you say "specialized in digital communications," that would include either what you described as the networking layer or the physical layer?

A: Right. A digital communications person understands that bits go from point A to point B and they deal with one aspect of the bits, what we would consider a lower layer than the networking person.

The networking person also deals with getting information from one point to another, also bits from one point to another, typically in larger chunks than an individual bit but in both cases, they have an understanding that they live in the area where they are simply delivering information around and with the understanding that they are delivering information, they are then to some extent enabled to question, well, what can I do with the delivery.

Q: Having said all that, do you believe that Mr. Halpern is a person of ordinary skill in the art within your definition?

A: He's certainly, we could — we could pair up his expertise as he described it with respect to the, his, his networking understanding. I believe that his level of familiarity with compression is perhaps a bit on the low side but I, I didn't get to ask questions so I can't make a judgment as to my comfort with his combined knowledge on the two topics.

Q: Okay. If I understood you correctly, you were saying, you said that his level of knowledge of the networking piece of digital communications was sufficient but that you weren't sure about whether he had sufficient familiarity with the compression technology piece. Is that correct?

A: Yes, although I guess I would like to add something —

Q: Go ahead.

A: — which is perhaps I felt that, perhaps his networking understanding was a bit narrow within the networking layer. Now, given his background, I can understand that. He certainly didn't study physical layer communication with, with a math

degree and that's fine. We don't expect people to do that.

Q: You said that you think his experience was narrow. What do you mean by "narrow"?

A: So I have described without giving a very formal definition of what I mean by these layers and we have the physical layer which simply sends material, digital material from one point to another. We have the networking layer which includes, it doesn't care about the physical transmission media but addresses how the bits get from point A to point B. I guess my understanding of such a person as I described is that the physical person would have some knowledge of the networking layer and the networking person would also have some knowledge of the physical layer and simply because I most commonly interact with people who know both layers, as an electrical engineer. And with that, I suppose I would have to rethink or think, think through in greater detail if somebody solely focuses on the network issue, the networking layer alone, without any consideration of the physical

layer, the implications of that with respect to interpreting the patents.

Q: So you don't have an opinion about that one way or the other?

A: Could you restate that?

Q: Sure. I —

A: Just remind me of what "that" is.

Q: You just said that — all right, well, maybe not "just" since you've been explaining something for a while but at one point, we talked about the networking layer and the physical layer and you said that it was your view that the familiarity with digital communications that you require in your report could be satisfied by either. It sounds like you just said that you might want to rethink that. Is that right?

A: I, I did just say that, however, I, I think what I would like to say is I would really have to reconsider the entire issue. I have always understood networking people to understand something about the physical layer and physical layer people to understand something about the network layer.

I guess what I'm really looking for is somebody who's able to think flexibly and understand that they are delivering digital information and that there are multiple layers and that they may sit at one layer but other things go on at other layers.

Q: Are you capable of making a judgment right now about whether Mr. Halpern has ordinary skill in the art under your definition?

A: Ordinary skill in the art here, you are referring to both items, the digital communication technology and the compression techniques?

Q: Correct.

A: And, again, I would like to go back to what I said. I am, based on what I read in his report and what I heard during the deposition, I am unsure of the depth of his knowledge on the compression techniques.

Q: So does that mean that your, the answer to my question is yes, you're not capable of making a judgment right now?

A: I think that's accurate.

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Q: You think that's accurate?
A: Yes.
Q: "Yes," that's accurate?
A: Yes.
Q: "Yes," you are not capable of making a judgment right now?
A: Based on what I know, yes, I am not capable of making a judgment.
MR. BROWN: Okay. Let's mark as Exhibit 79 a document with production numbers APBU159385 through 393.
(Documents bearing Bates Nos. APBU00159385 through 393 was marked as Deposition Exhibit No. 79 for identification, as of this date.)
Q: Exhibit 79 is now in front of you. Have you seen this paper before?
A: I have.
Q: This paper is called, "Scene Adaptive Coders." Is that right?
A: Yes.
Q: Are you familiar with this paper?
A: I am.

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Q: Can you describe this paper briefly?
A: This paper describes a still image lossy compression algorithm. I guess I'll put a period at the end of that sentence.
Q: It describes using that algorithm for coding real-time color television transmission over a 1.5 megabit per second channel, correct?
A: No. It does not describe that. That is a sentence in the abstract. The paper does not describe that.
Q: Can you turn to the conclusion of the paper?
A: I don't see a conclusion.
Q: I'm sorry. The summary at the very end.
A: Yes.
Q: The final sentence of that summary reads, "At Compression Labs, Inc., the coder has been implemented with real-time hardware to code NTSC color video at a channel rate of 1.5 megabits per second." Do you see that?
A: I do.
Q: Doesn't that state that the technique described in this paper has been used in real-time hardware to code color television at 1.5 megabits per second?

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A: That sentence does state that they built or they implemented real-time hardware at CLI to do that but the statement that you asked me previously was not that.
Q: Why is it that you think this paper does not describe coding color television at a 1.5 megabits per second data rate?
A: This paper describes a still image compression algorithm. It starts off on the first page with section 2, describes a cosine transform and then goes through some statistical analysis of how those cosine transform coefficients would behave.
It then describes what it calls the scene adaptive coder by going through the steps on the second page, a cosine transform, a thresholding operation, normalization and quantization.
These are all operations that are done on a still image and the coding operation where coding here is referring to a lossless coding.

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It then goes through and describes a rate buffer. The rate buffer has to do with making sure that you hit the right size —
Q: I'm not sure that I asked you for a complete description of every part of this paper. In fact, I'm confident that I didn't.
Do you recall the question that I asked you?
A: The question that you asked me is what does the paper describe.
Q: No.
MR. PAYNE: I'm going to object because I think that she was still trying to complete her answer but go ahead.
Q: I think it's clear that you're not answering the question that I asked you but if you want to finish saying something, go ahead.
A: Well, my understanding of the question was why does this not represent coding video and everything I have described to one of ordinary skill in the art is describing compression, lossy compression of a single array of pixels representing an image.

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Were the paper to describe video coding using this coder, I would expect the paper to describe things that are not here.

Q: Like what?

A: So the hardware configuration, what did they use, how did they interconnect things, did they design custom circuitry, was the circuitry discrete or integrated, how long did it take, how many man-hours, did they do subjective tests on the video.

Furthermore, the entire results section presents results for still images. All they have done with this sentence is applied the number, 0.4 bits per pixel, to the digitized pixel rate of NTSC video. Video has so many pixels per second.

They state in the abstract that they get good results at .4 bits per pixel. So it's a simple matter to multiply .4 bits per pixel times the number of pixels per second that one gets for digitizing NTSC TV to compute that 1.5 megabits per channel.

Q: Is it accurate to say that in your view this article does not contain sufficient

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disclosure of video coding to tell one of ordinary skill in the art that this is how to do video coding? Is that right?

A: One of ordinary skill in the art would understand that any technique that could be applied to a single image could be applied to digitized images which were obtained from NTSC video or PAL or any other format of video. So to some extent, there's nothing to disclose there.

This is a coder that operates on a single image and we can certainly consider video to be a very special case of particular sequence of images. And that sentence in the summary is essentially doing that, saying, well, if we take images as produced by digitizing a standard video signal, the resulting data rate is the following.

Q: Okay. But what I'm trying to understand is whether this paper, in your view, discloses video compression to a person of ordinary skill in the art?

A: This paper describes an intra-frame coding technique, sorry, a single frame or image compression technique which one of ordinary skill would understand could be applied to frames in

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sequence from digitizing a standard analog video signal.

Q: And this paper says expressly that that can be done, correct?

A: It, it states that, that it computes a number based on the assumption. I mean, they do not state in order to apply this to video, first digitize the video, then take each frame."

They don't give us a block diagram, for example, but one of the ordinary skill would understand even without John's paper that coding individual frames independently is a valid technique for compressing or coding video.

Q: You said before that this paper didn't disclose things that you would expect it to disclose if it was going to actually describe video compression and you listed a variety of things that you would expect to be disclosed, including the hardware configuration and the circuitry that they used.

A: Based on the sentence in the summary, that is what I stated.

Q: Now, so your view is that this paper doesn't disclose the hardware configuration and it

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doesn't disclose the circuitry and, therefore, it doesn't disclose video compression to a person of ordinary skill in the art. Is that right?

MR. PAYNE: Objection. Form.

Q: And if that's not right, explain why.

MR. PAYNE: Objection to form.

A: So my objection with calling this a video compression paper is that it describes a still image compression technique and simply gives a computation of the resulting bit rate that would occur if one applied this to video.

Q: And in your mind, that's not enough to make it a paper about video compression. Is that right?

A: I think, I would say that is correct in that when I look, when a person of ordinary skill looks for a paper about video compression, it's not enough to simply look for the word "video" to appear because just because "video" appears doesn't necessarily mean it is about video to start with.

And secondly, to take an intra, a still image coder and simply provide the rate that

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one would achieve at a particular input rate, intra-frame coding was well understood so there's nothing new here.

Q: In your view, there's nothing new in this paper, "Scene Adaptive Coder," as Exhibit 79?

A: If we consider video compression — the still image compression technique in this paper was clearly judged worthy of publication by the IEEE but due to, presumably, its novel technical content.

The technical content of the paper involves coding still images. They simply state that when applied at a certain rate, this could be applied to video. That was not the novel part of the paper.

Q: When did you first see this paper?

A: Oh, when I was in graduate school, many years ago.

Q: In what context did you see it in graduate school?

A: Well, I studied image and video compression and transmission in graduate school and to the extent that this was a, I wouldn't say it was classical at the time because it was not

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that old at the time, but this was a well-known, well-written paper by the time I got around to reading it.

Q: When was that?

A: It was on its way to being classical. How's that?

Q: As of today, would you call this a classical paper?

A: I would.

Q: What do you mean by a classical paper?

A: A classical paper is a paper that is, that we sort of cite frequently as the beginning of perhaps a — there are going to be several items here so don't take the order in which I give them as necessarily indicative of how important something is.

A classical paper either indicates, perhaps, a paradigm shift in how problems were addressed. They may, typically are well written. Obviously, if a paper is not well written, even if the ideas are new, dissemination doesn't work very well.

Also, sometimes I think we can say

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that classical papers are sort of the, the paper on which many, many subsequent incremental but important improvements or modifications are made.

Q: And this paper qualifies under that standard?

A: I believe that if you talk to an image compression person and ask them if this were a classical paper, they would say yes.

Q: Are you an image compression person?

A: I am.

Q: And you think this is a classical paper?

A: I do.

MR. PAYNE: Nick, are you at a good stopping point or do you have some questions on something else?

MR. BROWN: I would be happy to take a break now if that's what you would like to do.

MR. PAYNE: Five minutes?

MR. BROWN: That's fine.

THE VIDEOGRAPHER: The time is now 10:25. Off the record.

(Recess taken)

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THE VIDEOGRAPHER: The time is now 10:32. On the record.

BY MR. BROWN:

Q: Dr. Hemami, can you take your expert report and turn to the materials considered list at the end? Do you have that?

A: Yes.

Q: Will you turn and look at number 26, please?

A: Yes.

Q: Do you see it says there, "The claim construction disclosures of Burst and those of Apple as well as the references cited in each"? Do you see that?

A: Yes.

Q: If you turn to the binder that's in front of you, which is Exhibit 71 and go to tab U, please.

A: Okay.

Q: If you turn past the page that has the U on it, do you see that this is a document filed with the court entitled, "Patent Local Rule 4-3 Claim Construction and Pre-Statement"? Do you see that?

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A: Yes.
Q: Why don't you flip through that document until you get to the tables that follow it.
A: Okay.
Q: Have you seen those tables before?
A: I don't know if I've seen them from this document, but I certainly have seen claim construction tables which are rectangular and long like the ones that Les has.
Q: Okay. Going back to your report, number 26 which reads, "The claim construction disclosures of Burst and Apple," does that include the tables that are rectangular and long that you are referring to?
A: Yes.
Q: You state in your expert report the references cited in each. Do you see that?
A: Yes.
Q: Do you see how there are two columns in there? One is labeled "Burst's Evidence" and one is labeled "Apple's Evidence." Do you see that?
A: Yes.

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Q: And do you see that in those columns there are various references cited at various places?
For example, on the second page in the "Burst's Evidence" column, The Modern Dictionary of Electronics, 6th Edition, 1984 is cited. Do you see that?
A: Yes.
Q: Are those the references, is that an example of one of the references that you were referring to?
A: Yes.
Q: When you wrote in your expert report number 26, "the references cited in each," did you mean anything other than what is cited in the "Burst's Evidence" and "Apple's Evidence" columns?
A: That item in the reference list refers to the materials that were listed in these columns so I don't remember if your question was phrased as a positive or a negative, but —
Q: Okay. When you wrote in your expert report, "the references cited in each," what you meant is the references contained in the "Burst's Evidence" and "Apple's Evidence" columns. Is that

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right?
A: That's right.
Q: And did you review each of the references listed in those two columns?
A: I tried my very best to do every single one.
Q: So, for example, you looked in the Modern Dictionary of Electronics. Is that true?
A: I did.
MR. BROWN: I'm going to mark as Exhibit 80 a copy of a few pages of The Modern Dictionary of Electronics. It's only got one page from the actual content of the dictionary, production numbers APBU414957 through 959.
(Documents bearing Bates Nos. APBU00414957 through 959 was marked as Deposition Exhibit No. 80 for identification, as of this date.)
Q: And you see on the face of Exhibit 80 is The Modern Dictionary of Electronics, 6th Edition. Do you see that?
A: Yes.
Q: That's the dictionary that's

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referred to in the "Burst's Evidence" column of the chart that you were looking at, correct?
A: Yes.
Q: I'd like you to look at the third page of Exhibit 80, which is one page from the dictionary.
A: Yes.
Q: On the right-hand side there's a definition of "burst transmission." Do you see that?
A: Yes.
Q: I don't believe that this dictionary was cited by Burst in relationship with the term "burst transmission" in the chart.
Did you read or consider this definition before writing your expert report?
A: I did.
Q: Were you familiar with this definition prior to seeing it in this dictionary?
A: No.
Q: Do you believe this definition is accurate?
A: In the context of the way that "burst transmission" is used in the Burst patents,

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no.
Q: This definition expressly refers to radio transmissions, correct?
A: It does.
Q: Do you believe that this definition is accurate in the context of radio transmissions?
A: I believe that this definition describes analog radio transmissions.
Q: Is the reason that you believe this is not accurate in the context of the Burst patents that in your view, the Burst patents pertain to digital data transmissions?
A: Yes.
Q: Is there another reason?
A: Not that I can think of now but that's certainly the largest one that looms in my mind and that is exactly what my reaction was when I read this definition the first time.
I should say this is transmission of analog information.
Q: How is that different in your mind from what you said before?
A: Well, I said analog radio transmission which to me means transmission of

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analog signals but I wanted to clarify because, forgive me, I don't think you're an electrical engineer. I wanted to clarify that it was the delineation between digital signals being transmitted and analog signals being transmitted.
Q: Earlier you were talking about the physical layer. Do you recall that?
A: I do.
Q: Typically that physical layer uses analog transmission to convey digital information, correct?
A: Yes.
Q: In fact, I believe that's always the case, correct?
A: One could make an argument differently for switching bits on a copper wire but I think what, generally speaking, what you've said, yes.
Q: So, generally, digital information is conveyed using analog signals?
A: Yes.
MR. PAYNE: Objection to form.
A: Perhaps — yes, let me correct myself.

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Digital signals are transmitted using analog modulation techniques.
Q: Analog modulation techniques of an analog signal?
A: No. The signal that is being modulated is, can be digital, can be digital.
Q: You're modulating an analog waveform, correct?
A: Yes.
Q: And you're doing that in order to convey digital information, correct?
A: Yes.
Q: I think the word "signal" may be confusing things but if you want to transmit digital information from one point to another, generally you need to do that by modulating an analog waveform. Is that true?
A: That is true.
Q: One type of analog waveform that can be modulated in order to convey digital information is a radio wave, correct?
A: That is correct.
Q: You can also modulate a microwave, correct?

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A: A microwave is a radio wave.
Q: It's a subcategory of a radio wave, correct?
A: Yes, I would agree with that.
Q: Let's talk briefly about microwaves since we're on the topic.
Microwave transmission is described in the Burst patents, correct?
A: Yes.
Q: And the Burst patents describe using satellites, correct?
A: Yes.
Q: And they also describe using point-to-point microwave transmitters, correct?
A: Yes.
Q: Are those two the same thing?
A: Are they the same thing? Can you be more specific in your question?
Q: Sure.
Both microwave, point-to-point microwave transmitters and satellites use the microwave band to transmit information, correct?
A: Yes.
Q: They both modulate microwaves,

correct?
A: Yes.
Q: What are the differences at a high level between point-to-point microwave transmission and satellite transmission?
Actually, let me withdraw that question. I'm going to ask it slightly differently.
Satellite transmission is generally not point to point, correct?
A: The satellite is used as a relay between the two points. So, yes, we would not call satellite, we would not call satellite transmission point to point.
Q: Are the structures that are used to do the transmission the same in point-to-point microwave transmission and satellite microwave transmission?
A: Which structures are you referring to?
Q: Let's start with the structure which actually transmits the signal.
Is it true that in a satellite, the structure that transmits the signal transmits it over a wide directional area?

A: The statement that you just made is not correct.
Q: Okay. I believe, and please correct me if I'm wrong, that one significant distinction between a satellite transmission and a point-to-point microwave transmission is that in point-to-point microwave transmission, the microwave beam from the microwave transmitter is relatively narrow when compared to the beam from the satellite and has to be specifically directed at the receiver in contrast to the satellite.
Is that generally true?
A: What you have stated with respect to the, the point to point using a very narrow beam is accurate. Clearly the narrower the beam, the more energy is concentrated in, in a region.
As far as satellite relay is concerned, I have to say I do not know — this depends if we're using the satellite to broadcast or to essentially target a particular individual reception point.
Q: Well, let's talk about that.
Are you familiar with the DirecTV satellite system?

A: I am.
Q: In fact, you tendered an expert report on satellites that were part of that system, right?
A: That's correct.
Q: Those satellites are capable of sending signals in a broadcast fashion, right?
A: They do.
Q: And that's not a point-to-point microwave transmission, right?
A: Certainly from the satellite down is not point to point. That is a broadcast delivery.
Q: The antenna that creates the broadcast signal is a different kind of antenna than the one that is used for point-to-point microwave transmission, correct?
A: I do not know if that is correct.
Q: Okay. What level of knowledge do you have about the structure used to send microwave signals either from satellites or in point-to-point transmissions?
A: My level of knowledge pertains to or is at the level of being able to describe the sequence of events that has to occur, say at the

level of a block diagram such that I can point to what occurs in each block of the diagram, this level of abstraction.
What I do not have knowledge in is antenna design and beam forming.
Q: Do you — let's put this in context. Can you pull out the '839 patent which is in front of you? I believe it is Exhibit 3 and if you could look at column 12 at line 10.
A: Yes.
Q: The '839 patent says that, "Both point-to-point microwave transceivers and satellite transceivers may be used."
Do you see that?
A: Yes.
Q: It appears that the Burst patent is drawing a distinction between a microwave transceiver and a satellite transceiver, correct?
(Telephone interruption)
Q: Sorry about that. Go ahead.
A: Nice ring.
Q: Do you want me to repeat the question?
A: No. I understand your question and

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I would have to say I'm not sure about that.
Q: It certainly describes them as two
different things in this sentence, correct?
A: There are two items in the sentence,
yes.
Q: And one of them is a microwave
transceiver, correct?
A: Yes.
Q: And the other one is a satellite
transceiver, correct?
A: Yes.
Q: A satellite transceiver uses
microwaves, correct?
A: It does.
Q: But at least some of the time, as
we've just described, it uses a broadcast signal
as opposed to a point-to-point signal, correct?
A: A satellite would do such a thing,
yes.
Q: So one can distinguish between
point-to-point microwave transceivers and
satellite transceivers on the grounds that one is
a point-to-point signal and one is a broadcast
signal, correct?

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A: I, again, I, I'm not —
Q: I don't mean to ask you specifically
about that, this sentence yet.
A: No, no, I understand that. I
understand that. I'll tell you my hesitancy.
I believe that satellites are used
to relay specific signals in a narrow band
fashion. I believe that can be and is done.
Q: And that would be a point-to-point
microwave transmission, right?
A: No. No. Point-to — in the
context — what I'm disagreeing with in your
characterization is that satellites always
broadcast and what I'm saying is —
Q: Sure.
A: — I'm not sure that is correct.
Now, in what you just — why don't
you repeat what you just said about, "and that
would be a point to point," just so I'm sure I —
Q: Okay. You're saying that satellite
transceivers can send point-to-point signals or
broadcast signals, correct?
A: No. So point-to-point microwave is
a term of art, okay? This is my issue with your

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phrasing here.
Q: Can I ask you about that?
A: Yes.
Q: The term of art, "point-to-point
microwave transceivers," can that include a
satellite transceiver?
A: My understanding of — now, a
satellite, a satellite that would serve as a relay
between two earth stations, certainly from a
communication perspective, we would characterize
the uplink as a point to point because there's no
relay in between and the downlink as a point to
point also because there's no relay. The two
ground units are clearly not point to point
because there is a, the satellite is relaying,
right, there's something in the middle.
Now, having said that, the
point-to-point microwave transmission, sorry,
point-to-point microwave transceiver which we have
here, there is a term which I've used in my
report, "point-to-point terrestrial microwave,"
which indicates that the "terrestrial" modifies
that the microwave is not going into space.
Now, I think that it is fair that

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certainly we would call from the ground station to
the satellite, that is indeed a point-to-point
link. I don't believe we would characterize the
transmission via relay as point to point even
though the individual constituent links were
point-to-point microwave links, point-to-point
links that used the microwave frequency band.
Q: Is it fair to say, based on what
you've just said, that the point-to-point
microwave transceiver described in lines 10 and 11
of column 12 of the Burst patent can't be
referring to a link through a satellite between
two of the transceivers described in the Burst
patents?
A: I don't think I would be comfortable
saying "can't." You know, my reading of this is
that a microwave terrestrial antenna and a
satellite terrestrial antenna are different
beasts. And the, the user or the person who's
going to purchase the device, shall we say, you
know, maybe wants to understand what the form
factor is, you know, what the orientation is.
If they don't have a line of sight
on the ground to the, the other point, then they

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must consider satellites. If they live in a forest, unless they can get the satellite antenna — well, if they live in a forest, they're sort of out of luck, but if they live in an area with overhanging trees where they can't get line of sight to the satellite then they need to consider perhaps the terrestrial.

Q: I thought you said that you would not consider a link between two places on the ground through a satellite to be a point-to-point link?

A: That is not, we would not call that a point-to-point link. We would say that that constituted two point-to-point links involving the satellite.

Q: Okay. I'd like to — we'll come back to the '839 patent. I want to talk about the '995 patent for a second and specifically I want to ask you some questions about the fax chip that's described in column 5 of the '995 patent.

Do you see in line 5 and 6 it describes the A.M.D. 7971 chip?

A: Yes.

Q: Are you familiar with that chip?

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A: I'm familiar with the chip to the extent that I read the data sheets that were part of the material that I reviewed.

Q: Okay. Do you have any familiarity with that chip other than through the data sheet that you reviewed?

A: With the chip itself? No.

Q: Have you ever used the chip?

A: I don't know. I mean, I may have used a fax machine that had the chip in it.

Q: Fair enough. Have you ever knowingly used that chip?

A: I can neither confirm nor deny that statement. No, most fax machines do not have a stamp on them as to what their internal engine is.

Q: So it's fair to say that you have never knowingly used that particular chip. Is that right?

A: I have never knowingly used that chip but, you know, I don't know how many manufacturers made those chips. It may well be that if 90 percent of the fax chips were made by A.M.D. and I sent faxes in 1988, then I probably used one.

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Q: Fair enough. Do you have any opinion about whether that chip can be used to do video compression?

A: I do.

Q: And what's your opinion?

A: It can.

Q: And why do you think that?

A: Because one can, one can use the chip to compress color video frames as described in the specification.

Q: Do you recall what the — well, I use the term "data rate." Does that — another word might be "throughput."

Do you know how much data the A.M.D. 7971 chip can handle in a particular amount of time?

A: So what are you calling "data"?

Q: Well, as I understand it, this is a fax chip, correct?

A: Yes.

Q: And it will receive information, I would assume, from a scanner, correct?

A: That, that is certainly one way we can certainly assume — well, the chip actually

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gets its data from memory. It's not really our business where, how the data got to memory.

Q: Fine. So the chip gets data from somewhere, potentially memory, correct?

A: Yes.

Q: And what does it do to that data?

A: It takes the data and it puts it through the CCITT Group IV algorithm that it implements and then it outputs compressed data.

So here, when we say "data," to be clear, we are referring to a sequence of bits.

Q: So the 7971 chip implements a specific CCITT Group IV algorithm, correct?

A: Yes.

Q: The CCITT Group IV contains a number of different algorithms, correct?

A: I don't think so.

Q: Okay.

A: Well, what type of algorithm are we discussing? Can you be more specific?

Q: Can you give me a general description of what you understand the algorithm or algorithms in the CCITT Group IV to be?

A: My understanding of the CCITT Group

IV compression algorithms is that they are compression algorithms for binary images, where a binary image is — I use the term "image" here sort of as a ray when I think of a rectangle — and in each position we have a zero or a 1. So it can only take on two values, zero or a 1. Hence, the word "binary."

Q: So this, the algorithm — I think you used the plural when you, in your description — the algorithms in CCITT Group IV process what you call binary images. Is that right?

A: Well, let's say the chip runs an algorithm. "Algorithm" is sort of a nebulous word but it processes binary data.

Q: What do you mean when you say "algorithm" is a nebulous word?

A: Well, algorithms have sub-algorithms. It depends on what level we're talking about.

You know, we could draw a block diaphragm, for example, of JPEG and talk about the entire JPEG algorithm or the cosine algorithm or various pieces. So it's, it's, it can refer to many levels of a particular task that we are

trying to implement.

Q: If one builds an integrated circuit to implement an algorithm, one cannot later change that algorithm, correct?

A: That depends on how you build your integrated circuit.

Q: So you can build a programmable integrated circuit?

A: Sure.

Q: Is the CCITT Group IV algorithm or any of the algorithms within it capable of processing images that are not binary images?

A: A single pass-through the — well, how am I going to put this?

The algorithm could be used, can be used to process color images but we have to run it in parallel —

Q: So you need —

A: — in some manner.

Q: You need more than one chip, in other words?

A: Not necessarily.

Q: You could feed the data in serial fashion through the same chip?

A: Yes.

Q: But the data that you need to feed through the chip has to be a binary image, as you put it?

A: That is correct.

Q: So if you broke a color image into a series of binary images, you could then feed those images in succession through the chip. Is that right?

A: That is correct.

Q: Or alternatively, you could feed those binary images in parallel through a number of different chips?

A: Or even in parallel through the same chip.

Q: Is the 7971 A.M.D. chip that's described here capable of processing data in parallel?

A: For the, the data, the color image data as it is described here, and as we would expect color video data to be, yes.

Q: What do you mean by that?

A: So what's given in the specification is, the example that's given is a frame that is of

size 300 by 300 with each pixel defined by 21 bits. And this 300 by 300 is a reasonable frame size for digitized video, you know, as opposed to say, 10,000 by 10,000 or 3 by 3. This is a reasonable number. That is completely what one would expect.

Q: Here it says that each pixel is defined by 21 bits, correct?

A: Yes.

Q: Could you break that into 21 different 300 by 300 binary images?

A: Yes.

Q: And at that point, you could feed those 21 binary images through the 7971 chip, is that right?

A: That's correct.

Q: Or through a series of parallel chips?

A: Or in parallel through one chip, yes.

Q: Okay.

A: You could feed some number of them in paralegal through one chip.

Q: Is the A.M.D. 791, I'm sorry, 7971

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chip capable of processing nonbinary images?
A: Well, it's a bit of a —
Q: You're right. Let me try it
differently.
Is it, is the chip, this A.M.D. 7971
chip capable of directly processing nonbinary
images?
A: What does —
MR. PAYNE: Objection to form.
A: What does "directly processing"
mean?
Q: Sure. I think we just described how
you can use this chip to process a 21 bit color
image, correct?
A: Well, you described it.
Q: Fair enough. It's accurate to say
that the A.M.D. 7971 chip can process a 21 bit per
pixel color image by breaking it into 21 separate
binary images, correct?
A: Yes, that is an accurate statement.
Q: Okay. Would it be possible to send
a 300 by 300 frame with 21 bits for each pixel
through the A.M.D. processor without breaking it
into 21 separate frames?

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A: Well, in fact — now, let me think.
Okay. I would have to look at the
data sheet to — I don't want to rely on doing
math in my head or remembering the data sheet but
as far as that A.M.D. chip is concerned, remember,
it doesn't know that the bits that we are pushing
into it, whether they came from our 21 bit color
image or whether they came from a scanner or
whether somebody accidentally unplugged the
machine prior to turning it back in and those bits
that it's going to process are just whatever state
the memory powered back up in.
So we can feed it any bits we want.
It will not, it will not explode. It will not
raise a red flag saying, you know, this data
doesn't —
Q: Understood. You can feed any bits
you want into the chip is what you're saying, is
that right?
A: Yes.
Q: Okay.
THE VIDEOGRAPHER: I need to
change the tape.
MR. BROWN: Do I have five

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minutes, three minutes?
THE VIDEOGRAPHER: You have
about one minute.
MR. BROWN: Let's change the
tape.
THE VIDEOGRAPHER: The time is
now 11:04. This marks the ending of
tape number one. Off the record.
(Recess taken)
THE VIDEOGRAPHER: The time is
now 11:05. This marks the beginning
of tape number two. On the record.
BY MR. BROWN:
Q: Before we took that brief break, I
think you said that the algorithm or algorithms in
the CCITT Group IV processed binary images,
correct?
A: They're intended to process binary
images. The, the chip was designed with binary
images in mind.
Q: That's exactly where I was going.
You've anticipated me perfectly.
So even though they're designed to
process binary images, you can feed other data

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into them, right?
A: Well —
Q: There's nothing to stop you?
A: First off, you can feed any data
into it.
Q: Right.
A: Now, we would hope that we would
feed data that had something in common with a
binary image if we wanted to use the chip in such
a manner to achieve compression.
Q: Let's talk generally about
compression and I think that the reason for what
you just said is that different kinds of data have
different patterns of bits in them that make
different algorithms more and less effective at
compressing them. Is that true?
A: I think that's a laymen's
understanding, which if I were explaining it to
somebody on a bus, that is probably what I would
say to them.
Q: Excellent. Let's suppose you were
explaining this to a Federal judge who is an
extremely intelligent and accomplished woman.
How would you clarify and deepen

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that explanation?
A: I would state that compression algorithms, some compression algorithms are designed for specific statistical characteristics of input data. A compression person or a signal processing person would describe one important statistical characteristic as correlation.
I like to explain correlation to nonstatistically-oriented people as if I gave you, say, if I drew a signal on a white board or I gave you an image or I gave you the Dow Jones Industrial Average closing over a series of days, and I went in and removed or erased a pixel from the image or a sample from the audio or a closing from the Dow Jones sequence and handed it to you and said, "What do you think goes there?" You would be able to make a fairly accurate — and when I say "accurate," I mean if we repeated this many, many, many times and computed some error measure, most of the time you would pick something that is very correct.
Now, obviously, September 11th something strange happens, you know. There are things we cannot predict from surrounding data but

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correlation is a characteristic of data that somehow data close together in space or time or however we are presenting the data is related to each other in a manner that you, as a human, might be able to understand what it is.
Even if you can't, there are mathematical techniques that we can employ to repeat and maybe even do better than, certainly sometimes definitely do better than your educated guess as a human.
Q: So let's use an example. The patent talks about, in the context of video, comparing the pixels that have changed between successive frames of a video, correct?
A: Yes.
Q: And the reasoning there is that in video, not all pixels will change between two successive frames, correct?
A: Yes.
Q: So for example, if you have the video of a talking head on CNN, the pixels in the background are unlikely to change very much between frames. Is that right?
A: That's correct.

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Q: And that is an example of correlation as you've just described, correct?
A: Yes.
Q: So what would be correlated is the pixels between successive frames. Is that right?
A: Yes. We would expect a large number in which you've described of the pixels between correlated, I'm sorry, between nearby frames.
Q: Sure. Let's take another example. If someone were to take a digital picture of you sitting here right now, it would include your jacket, right? And the color in your jacket, while quite nice and subtly different in various places —
A: Oh, yes.
Q: — it's generally the same throughout your jacket. Is that right?
A: Well, I'll go with your example, yes.
Q: I mean I recognize that maybe the jacket isn't ideal because there's green and red. It's a very nice jacket.
A: I would actually use the jacket in my class as an example of perhaps you can't

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predict so well from one point to another.
Q: Well, then, you know what? Let's not use your jacket.
A: You could use the lovely background.
Q: That might not work very well either.
A: How about the wall?
Q: Let's suppose that you picked up a blank white piece of paper and you held it up to the camera —
A: Here we go.
Q: — and then you took a picture. There would be, I think you'd agree, a high amount of correlation between the pixels within the area that represents the blank white piece of paper, is that right?
A: Absolutely.
Q: And generally in images, it's possible to find areas where there is correlation between pixels that are located in similar places. Is that right?
A: Yes. I mean, but the fact that we can see is sort of evidence that in most images, you know, adjacent things tend to be very

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correlated.
Q: And image compression takes advantage of that fact, correct?
A: Yes.
Q: Or at least it can?
A: Yes. Yes. I would say general image compression algorithms, for example, that we can't predict what every single picture that someone is going to take is. JPEG, for example, exploits this fact.
Q: Okay. Now, let's take a very different example. Let's talk about a database file that's a binary file on a computer.
That file will also have correlation within it, correct?
A: Maybe, maybe not. It depends how it's stored and what the file is and what format it is.
Q: Fair enough. We don't necessarily need that for the, for the case.
What I wanted to ask you is it true that the efficiency and performance of any given compression algorithm depends on whether the data that's provided actually has the type of

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correlation that it was designed to handle?
So, for example, if you have a video compression algorithm which one would expect to look for, so to speak, correlation between pixels and successive frames and you created, using some video authoring tool, a bizarre kaleidoscope where no pixels remain the same between successive frames, the performance of that algorithm would degrade immensely, right?
A: If the algorithm is designed for what we would call natural images, then if you gave it an arbitrary collection of frames consisting of an arbitrary collection of pixels, we would expect that the compression would not be as good as if you fed it, say, footage of a football game.
Q: Right. So is it generally true in compression that the performance of the algorithm is related to whether the data it is receiving contains the types of correlations that the algorithm is designed to handle?
A: Well, what type of compression are you talking about?
Q: Let's use video compression.

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A: There are some compression algorithms for which what you said is not true. And for video compression, video compression algorithms designed for natural video, we would expect that if we fed it video with different statistical characteristics, it would not do as well.
Q: Let's take the specific example of the 7971 chip here.
Would you expect that chip to perform better for black and white fax images than for color video images?
A: How do you define "better"?
Q: Well, I'm probably not very good at that. You're a compression expert, true?
A: Yes.
Q: How would you define a "better compression" performance?
A: Well, the question that you have asked is, is a little bit awkward and I will oblige you by telling you why.
The CCITT Group IV algorithm is a lossless algorithm for binary images. So the array that you send in of 1's and zeroes arranged

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in an image format will come out as exactly the same array of 1's and zeroes, modulo the options and the chip. You know, you can set the, you can set up the border if you would like.
I think there's some, there's some options for, shall we say, presentation of the output of the fax on the page, okay? But if we're talking about just the bits that refer to the single array, the array of binary images that went in, those bits will come out exactly the same.
Now, a video compression algorithm, we don't need the output video or the decompressed video to be pixel for pixel equivalent to the original. Now, you could argue maybe for fax. You don't need it. We're all able to read lousy faxes, right? You know, that's clearly not a pixel for pixel equivalent. But as far as the chip is concerned, it produces the same binary image decompressed as it decompressed.
Q: I don't mean to interrupt you. I was trying to understand how you would define "better compression."
A: Okay. Okay. So with respect to the fax, okay, we're talking about a lossless — so

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with respect to binary, single binary image, we're talking about lossless compression. So the only metric that we have is the size.

Q: The size of what?

A: The size of the compressed file, okay?

Now, with respect to the video, we can produce output video of varying qualities and the varying qualities correspond to varying sizes of the compressed file. And the designer of the system or whoever, you know, however this is being used, can make design choices as to tradeoffs involved on what size of file we want and what quality of output video we want.

Q: Is it possible to use the A.M.D. 7971 chip to do lossy compression?

A: Yes.

Q: How do you do that?

A: We simply do not feed it all of the 21 bit planes.

Q: So it's possible to use the chip within a work flow that produces a lossy compression. Is that right?

A: Work flow?

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Q: Okay. We'll avoid that word if you don't like it.

Is it true that the loss, in the example you just gave, is injected by something other than the A.M.D. chip?

A: That is accurate.

Q: Is the A.M.D. chip itself capable of implementing a lossy compression?

A: That I don't know. I'd have to reread the, the chip description.

Q: But your understanding sitting here today of the algorithm it runs is that it's a lossless algorithm. Is that right?

A: My understanding of the algorithm is based on the standard document. So I, when I discuss this chip, I am — it has options, it does things that allow for, I think what CCITT Group IV maybe considered not falling within the standard but the engine is a CCITT Group IV standard. So, you know, I don't know if CCITT Group IV allows for putting borders on pages or some of the other options that the chip has.

Q: Okay. So when you say that the chip performs a lossless algorithm, what you meant is

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that it performs a CCITT Group IV algorithm which are generally lossless algorithms?

A: Yes.

Q: Are there any lossy CCITT Group IV algorithms?

A: To my knowledge, no.

Q: All right. Let's talk about the next paragraph which says that, "The compression algorithm can simply record data corresponding to only those pixels which change color from one frame to the next."

Do you see that?

A: Yes.

Q: Is that a lossy or lossless algorithm or both? I shouldn't put it that way.

Does that describe a lossless algorithm, does that describe a lossy algorithm or could it be describing either?

A: At that point of the sentence, it could be describing either.

Q: Okay. In the context of the paragraph as a whole, is the answer any different?

A: So the question is — can you put the whole question together for me?

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Q: Sure. You said that at that point in the sentence, it could be describing either a lossy algorithm or a lossless algorithm.

The paragraph that runs from column 5, line 9 through — actually, I don't mean to ask you about the entire paragraph.

From column 5, line 9 through column 5 line 18, the sentence that ends with, "90 percent." Do you see that?

A: "90," yes.

Q: Does that portion of the '995 patent describe a lossy compression process, a lossless compression process or could it be describing either?

A: I read this as it could be describing either. It's, it's up to the system designer.

There is a general approach to video compression described here. The system designer would make specific decisions based on their requirements.

Q: Okay. Now, is it true that — well, there's only one thing that's actually described here which is recording data corresponding to

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those, only those pixels which change color from one frame to the next, right?
A: Yes.
Q: Now, that could be done in different ways. Is that right?
A: Yes.
Q: There are multiple different ways of encoding which pixels change color from one frame to the next in a video compression algorithm. Is that true?
A: That's true.
Q: Okay. And this patent doesn't differentiate between any of those ways. Is that true?
A: No. No. I don't think, I don't think it does. I mean, again, these are sort of, these are design issues, how one chooses to follow through on the suggestion.
Q: Right. All this patent says is that what you should do in the algorithm is record data corresponding to only those pixels which change color from one frame to the next. Is that right?
A: Well, I think that the broader suggestion — I don't think it says that's what

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you should do. It says that, the broader — this is suggesting in sort of jargon inter-frame coding, that rather than dealing with each individual frame as a standalone entity, for example, as the scene adaptive coder did, let us instead consider multiple frames at a time and see what we can do with respect to exploiting temporal correlation. So this 10 percent of the pixels changing from one frame to the next, this is an approximation, right?
You know, you could have frames where you have more. You can have frames where you have less. How a designer chooses to address changing pixels is, you know, this is a class of compression algorithms and there are many ways to implement specifics.
Q: Is the terminology that you would use to describe the class of compression algorithms that's referred to in lines 9 through 17 of column 5 inter-frame compression algorithms?
A: Yes. "Inter" as opposed to "intra."
Q: And the CCITT Group IV compression algorithm or algorithms that we were describing before are intra-frame compression algorithms,

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correct?
A: Were we to use it for our color image as we described, yes, we would call that an intra-frame compression algorithm.
Q: And what would you call it in the context it was originally designed for, the fax compression context?
A: I, I would still call it intra-frame from the standpoint it's, it's — clearly a fax is not a video, you know. What we consider a fax, a binary image, per se, could have come from a video frame but it is not itself a video frame unless you happen to be recording with a binary camera, some type of artistic video.
It operates on a single plane of data. Perhaps that's a good way to differentiate it.
Q: Earlier you said that the 7971 fax chip doesn't know where the bits that it receives came from. Do you remember that?
A: Yes.
Q: Do you know the rate at which that chip can process bits?
A: The data sheet gives a rate of 1 to

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12 megahertz for pixel processing rates.
Q: And by "pixel" in this case, because we're talking about a binary image, that's a single bit, is that right?
A: That's correct. That's correct.
Q: So it can process 1 to 12, you said megahertz?
A: That's the word they use. I mean I take that to mean megapixels, mega binary pixels per second.
Q: Which means millions of pixels per second. Is that right?
A: That's right.
Q: And I believe you said that in order to process the video that's described in the column 4 of the '995 patent, one would need to break that, the 21 bits representing the color in the images into 21 separate —
A: Planes.
Q: — planes.
And there's a calculation here which multiplies the number of pixels in a frame by the number of bits to give you 1.89 megabits per frame. Do you see that?

A: Yes.
Q: Did you check that calculation?
A: Yes, I did.
Q: And is it accurate?
A: I — well, you know, I don't remember that I checked the 1.89. I certainly checked the 51 gigahertz. So if this is consistent with — sorry, gigabyte storage size. If this is consistent with the 51 gigabyte storage size, then I believe that it's correct.
Q: Let's assume that it's correct.
A: Okay.
Q: All right. Whether this data is in the form of 21 separate frames or a single frame with 21 bits of depth for each pixel, it's going to have the same amount of data, is that right?
A: Yes.
Q: So let's assume the amount of data is 1.89 megabits. Is that right?
A: Uh-huh.
Q: Okay. That means that the A.M.D. chip that's described here would be capable of processing that data in real time given the processing rate that you described. Is that

right?
A: What you have just stated is inaccurate at several levels.
Q: Okay. Please explain.
A: So first off, one of ordinary skill would understand that we don't need 7 bits per color for good quality, NTSC quality video.
Q: Okay. You know what? That's fair and I'm not, I don't mean to ask you about what you could do in between because I understand it's possible to do things to the bits in between having 21 bits per pixel representing the color and feeding it into the fax chip. Okay? But bear with me for a second.
Let's assume that you were going to take the frames with 21 bits per pixel without doing any compression on the color and feed it into the fax chip. Are you with me?
A: Yes.
Q: Okay. At that point, assuming the math in the patent is correct, you would need 1.89 megabits per frame, right?
A: Yes.
Q: And the patent describes 30 frames

per second, right?
A: Yes.
Q: So that would be in excess of 50 and less than 60 megabits per second, right?
A: You're taking — yes, yes, 1.89 times 30.
Q: Which is somewhere between 50 and 60?
A: Some large number, yes.
Q: That's higher than the data rate of the fax chip that you just described?
A: Indeed, it is.
Q: So before the data was fed into that fax chip, it would need to be compressed to make it possible for the fax chip to process it in real time. Is that right?
A: No.
Q: Why not?
A: Well, no. We wouldn't compress it first. We would simply run several chips in parallel if we wanted to do lossless video compression which no one of ordinary skill would implement and I don't believe is described in the specification either.

Q: Okay. Does the specification ever describe using multiple A.M.D. chips in parallel?
A: Well, the specification states, "Various algorithms may be employed in the compression process," to which I'll just put a little asterisk and say knowing that one would throw away some lower bit planes, right, would fall in the category of "various," and then as an example, compression algorithms like CCITT Group IV.
Now, that doesn't say run it once. It is simply — just as a discrete cosine transform can be described as an algorithmic part of JPEG, there's no suggestion that we run it once per image. It's a block that's in there that we are going to run as part of the algorithm.
Q: Sure. So the algorithm —
A: So I don't read this to suggest that one is limited to a single chip.
Q: And that's because, like you said, the algorithm referred to could require using multiple chips in parallel. Is that right?
A: The compression algorithm for video, you know, cannot simply be, we can't just slap

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down the 7971 chip and say, there, we're done, right? This requires design.

So as I, you know, as I mentioned, a designer or a video person would know that we didn't need lower bit planes and could, would make an intelligent design decision about not processing those because the visual impact will be negligible or zero. And similarly, the designer sees a suggestion here for a compression algorithm in conjunction with the hardware chip and this is a, you know, they can use it. But to say that one, we have to have only one, I don't read it that way.

Q: What you've said so far is that the specification doesn't say you have to only use one chip, right?

A: Yes.

Q: My question was does it ever say expressly that you can use more than one chip?

A: It says nothing about any numbers of chips. Neither that you can use only one or that you must use more than one.

Q: Okay. What it does say is that the CCITT Group IV compression algorithms are

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available on a single integrated circuit and it provides the example of the A.M.D. 7971, correct?

A: Yes.

Q: And doesn't provide any other examples of chips that can do compression, correct?

A: Well, there are other chips that are referred to in the specification. The chip itself, certainly we could program it to do compression. In the context of the Burst patent, no.

Q: Okay. So you're referring to the CPU. Is that right?

A: Yes.

Q: And so it refers to microprocessors and I believe at the bottom of column 5 around line 50 through 55 it gives examples of microprocessors, right?

A: Right.

Q: And it would be possible to program those chips to do compression, correct?

A: Yes.

Q: But the Burst patent makes clear that the compression is not done by the CPU,

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correct?

A: The compression is done by the compressor/decompressor, yes.

Q: And are any examples of the hardware for the compressor/decompressor given in the Burst patents other than this A.M.D. 7971 chip?

A: There are no other examples of specific hardware for the compressor/decompressor given in the patent.

Q: Does the — strike that. Do the Burst patents describe any intra-frame compression algorithm other than the CCITT Group IV algorithm or algorithms?

A: The compression as described at the bottom of page 4, the general statement which starts on line 65 says, "Various algorithms may be employed in the compression process which enable the representation of a series of numbers by a reduced number of digits." The CCITT Group IV material follows after as an example.

So to one of ordinary skill, that "various algorithms" sentence suggests that there are things out there and you can go pick something but if you're too lazy to do so or you would like

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a kick in the rear, I'm going to provide you with just one example to get you thinking.

Q: Fair enough. So there's a statement in here that various algorithms can be used.

Is it true that the only example of an intra-frame compression algorithm that's provided in the Burst patents is the CCITT Group IV algorithm or class of algorithms?

A: That, that is the only example.

Q: Okay. We've talked before about the text between lines 9 and about 18 in column 5 as describing the, a class of inter-frame compression algorithms. Is that right?

A: Yes.

Q: So that text — well, other than that text, does the Burst patents provide any other examples of inter-frame compression algorithms?

A: That text represents the suggestion or the reference to the class, the class I would say, not a class, but the class of inter-frame compression algorithms.

Q: The distinction you drew between "the class" and "a class," does that mean that you

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view that paragraph that we just — well, it's not a paragraph — that text between lines 9 and 18 in column 5, as referring to the entire class of inter-frame compression algorithms?

A: So the class of inter-frame compression algorithms for video is anything that uses more than one frame, okay? So it's a very broad term.

Q: Fair enough. I'm just trying to understand why you drew a distinction between "a class" and "the class."

A: Because in your previous sentence, you said "a class" and I wanted to make it clear that inter-frame — you know, you're either using multiple frames or you're not.

Q: Okay. And in your view — well, let's back up.

This text describes a compression algorithm that can simply record data corresponding to only those pixels which change color from one frame to the next.

Is that true of all inter-frame compression algorithms?

A: No. I can think of one example

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where it's not but we are still using multiple frames.

Q: Okay. So the text in column 5 of the '995 patent refers to a very large sub-class of inter-frame compression algorithms that doesn't include all inter-frame algorithms but includes most of them. Is that right?

A: Well, let's also be clear that, you know, every single human on earth could design a compression algorithm and then we could design another one and another one and there's sort of an infinite number of compression algorithms.

There are a lot of hypothetical things that you could do that may or may not work better or worse that would still qualify as compression algorithms, but may not be anything that anybody would really care about so I would say, let's — from the standpoint of any type of video compression algorithm that somebody would attempt to use in a commercial product.

So this somehow suggests that it looks good enough and provides performance good enough that somebody somewhere would be willing to fork over money for it, okay? From that

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perspective, I think we can say the inter-frame compression algorithms are going to do something that compares pixels across one or more frames.

Q: Okay. Is it fair to say that by referring to algorithms that record data corresponding to only those pixels which change color from one frame to the next, the '995 patent is referring to all, I think you used the phrase "commercially viable" or at least this idea of commercially viable compression.

A: Let's go with the idea of "commercially viable." I think people have different opinions as to what is commercially viable and I'm certainly not a marketing expert but —

Q: Fair enough. Let's try it a little bit differently then.

Is it true that the text in column 5 that we've been discussing between lines 9 and 18 refers to any of the algorithms that could feasibly be used commercially for inter-frame video compression?

A: Any of the algorithms — let's say — "any" is a very all encompassing but —

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Q: That, that's fine. I'll ask it slightly differently. Would "most" work?

A: Let's go with "most."

Q: Okay. Is it true that the text in column 5 between lines 9 and 18 that describes — well, let me back up because I think you've already said that.

Is it true that the text in column 5 between lines 9 and 18 is referring to a class of inter-frame compression algorithms that would include most of the commercially viable video inter-frame compression algorithms?

MR. PAYNE: Object to form.

A: And you say "the commercially available," which suggests to me that you have something in mind.

Q: Maybe I better reframe the question. I might have misspoken.

Is it true that the text in column 5 between lines 9 and 18 would be understood by a person of ordinary skill in the art to refer to any one of a class which includes most of the commercially viable video compression algorithms that use inter-frame compression?

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A: I think that mischaracterizes my intended, my intended description of "commercially viable."
Q: Okay.
A: What I meant by "commercially viable" — let's see if I can come up with a better description — something that provides reasonable quality and reasonable performance where reasonable art design parameters.
I didn't mean to suggest that this was written in a way to encompass some algorithms that existed such that the patentee would be able to immediately go out and jump on people. That is not what I meant to suggest when I went toward the "commercially viable."
I was trying to exclude crazy things that somebody might put together for a paper in Hawaii because they wanted to go but one would never actually consider such an algorithm were one to attempt to build a system that could be used outside of the laboratory and the lecture presentation room in Hawaii.
Q: Okay. So let's try it one more time.

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Excluding unreasonable compression algorithms, is it true that the text between lines 9 and 18 of column 5 in the '995 patent describes the class of inter-frame compression algorithms for video?
A: I think that's fair.
MR. PAYNE: Are you at a good stopping point?
MR. BROWN: If you want to take a break, I'm happy to take a break. I could keep going but let's take a break. I certainly don't want to —
THE VIDEOGRAPHER: The time is now 11:44. Off the record.
(Recess taken)
THE VIDEOGRAPHER: The time is now 11:53. On the record.
THE WITNESS: Oh, can we go off the record?
MR. BROWN: Sure. Let's go off the record for a second.
(Discussion off the record)
MR. BROWN: Okay. Back on.

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THE VIDEOGRAPHER: Well, I didn't actually get a chance to go off the record.
MR. BROWN: Well, that's fine. We'll keep going.
BY MR. BROWN:
Q: If you look at the '995 patent, between lines 28 and 35, there's a paragraph beginning, "In one embodiment."
Do you see that?
A: Yes.
Q: That paragraph describes sampling the audio portion of the program, correct?
A: Yes.
Q: And it describes digitizing the audio. Is that right?
A: Yes.
Q: Sampling is part of the digitizing process, correct?
A: Yes.
Q: It says in the patent that it is digitized by digital to analog conversion. Do you see that?
A: Yes.

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Q: That's backwards, right? It should be analog to digital conversion?
A: Good, good catch. Yes.
Q: But in any event, after the analog to digital conversion which it describes as occurring at a sampling rate of 88,000 per second. Do you see that?
A: Yes.
Q: Presumably that means samples per second. Is that right?
A: Well, it says sample rate. Yes, samples per second.
Q: Well, do you think that means 88,000 of something other than samples per second?
A: No, no, but, that, that's fine.
Q: Well, I want to make sure I understand what you think that means.
A: No. No. I was —
Q: What does 88,000 per second mean?
A: No, it's, it's exactly samples per second. I mean, I read that as a replacement for hertz. A hertz is one over a second and instead of writing hertz, he wrote over second. It is 88,000 samples per second.

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Q: And he writes one byte per sample. Do you see that?
A: Yes.
Q: That's 8 bits, right?
A: Yes.
Q: He says that yields CD quality sound. Do you see that?
A: Yes.
Q: CD quality sound is actually 16 bits per sample, correct?
A: What is colloquially referred to as CD quality sound currently represents 16 bits per sample, yes.
Q: And there's a, a new format out. I'm not exactly sure what it's called but it uses 24 bits per second, right?
A: It's per sample, I think.
Q: I'm sorry.
A: And if you say so because I am not aware of that format.
Q: So are you aware of, I believe it's called the SACD format? Are you aware of that format?
A: No.

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Q: Fair enough. The sampling rate for CDs is 44,100 samples per second, correct?
A: That's right.
Q: So here he has double, slightly less than double that rate and slightly, and exactly half of the bits per sample. Is that right?
A: That's right.
Q: So this is, it's, in fact, true that the total number of bits described here is approximately the same as in CD quality sound. Is that right?
A: Approximately, because of the, it would be 88,200 if it were exactly, yes.
Q: Okay. The next sentence states, "The sampling rate could be dropped to reduce memory requirements." Do you see that?
A: Yes.
Q: Would you consider dropping the sampling rate as described there to be compression?
A: Generally, we do not — well, I think it, that perhaps describes — excuse me. That perhaps depends on the system

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description. I think generally I would not consider that to be compression but I can certainly imagine contexts in which it was described as such in that it would produce less data, smaller file sizes than without reducing the sampling rate.
Q: Here it's certainly described, implicitly at least, as reducing file sizes, right?
A: Well, it says memory requirements.
Q: So it reduces the amount of memory needed to store the audio data, right?
A: Required to store the, the raw samples, the raw digitized samples, yes.
Q: But you wouldn't consider that — well, I'm going to make sure I understand. Would you or would you not consider that sentence, in the context of the Burst patents, to be describing compression?
A: I don't believe I would describe dropping a sampling rate as compression because this is actually oversampled. So from very solid, a very solid signal processing argument, one can reduce the sampling rate and still exactly

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represent the data.
Q: The next sentence says, "The audio data can be compressed with conventional algorithms, e.g., a Fibonacci delta compression algorithm." Do you see that?
A: Yes.
Q: The Fibonacci delta compression algorithm indeed compresses audio data, correct?
A: It does.
Q: Does — strike that. We've now talked about four specific places where compression algorithms are referred to in the '995 patent. One is column 4 at around line 66 where it says, "Various algorithms may be employed."
A: Yes.
Q: Another is the CCITT Group IV compression algorithm at the top of column 5, correct?
A: Yes.
Q: And within that, the example of the 7971 chip is provided. Is that right?
A: Yes.
Q: Another class of algorithms is

identified in column 5 between lines 9 and 18, correct?

A: Yes.

Q: And then down at line 35, the Fibonacci delta compression algorithm is described?

A: As well as in the previous line, "compressed with conventional algorithms."

Q: So the Burst patent we've just seen describes various algorithms at the bottom of column 4, the CCITT Group IV algorithm at the top of column 5, a class of intra —

A: Inter.

Q: "Inter," excuse me. A class of inter-frame algorithms in column 5 between lines 9 and 18 and then both various, various conventional algorithms and the Fibonacci delta compression algorithm at lines 34 and 35, correct?

A: Yes.

Q: Besides those, does the Burst patents describe any other compression algorithms?

A: Well, in the context of mentioning compression, it appears in the objectives. With respect to describing algorithms, you have

identified the sections of the specification that solely concentrate on the data compression algorithms.

Q: So in terms of identifying algorithms that can be used, the sections I just identified is a complete list of what is contained in the Burst patents, correct?

A: Well, I guess I would like to go back and check and make sure that the word "algorithm" in the context of compression doesn't appear earlier, unless you would like to represent to me that it does not.

Q: Why don't you check? I will run a word search on "algorithm" and we will see what happens.

A: Now, do you trust your OCR?

Q: No, and nor should you but I will tell what you it provides. So please go check.

A: All right.

(Pause)

A: How are you doing?

Q: I'm about to start running the search. How are you doing?

A: I asked you first.

Q: According to my search, which as you point out depends on the validity of the OCR, the first appearance of the word "algorithm" is in column 4 at line 66.

A: Okay. So if we are tracking the word "algorithm," you know, taking into account that I'm not as fast as your machine and I don't want to sit here and go through every single word in my head, the, I would suggest that the objectives we refer to, sorry, the specification refers to utilizing a data compression technique.

Now, granted, the word "algorithm" is not there, but utilizing a data compression technique would suggest to one of ordinary skill that there was a compression algorithm in use in some manner.

Similarly, I think references to decompression in the context of, if those appear in the context of editing, that also suggests that obviously you can't decompress if you haven't compressed.

Q: Sure. And maybe the way to do this since you're talking about places that suggest an algorithm might be in use, that was not the intent

of my question.

What I really want to get at is — and I do want to take the time that we need to make sure that we have a complete list but what I want is a complete list of the algorithms and classes of algorithms that are disclosed for doing compression in the Burst patents. And so if you can take the time you need to give me that complete list?

A: I believe that what you have said is accurate. I think that sort of from a standpoint of being consistent between the audio and the video, we may want to include the paragraph that includes the digitization of the video.

You clearly cannot compress video unless it has been digitized. So to the extent that the audio paragraph discusses A to D conversion, you know, the paragraph that precedes the, "if each frame contains." Also, it describes an equivalent process.

Q: Let's make sure we're clear. You're talking about the paragraph in column 4 between lines, approximately 47 and 62. Is that right?

A: Okay. I am talking about not only

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that paragraph, but also the paragraph above that discusses the format for the video.

Q: The paragraph that begins at approximately line 32?

A: Yes, "The video signals defining."

Q: Is it accurate to say that the paragraphs between lines 32 and 62 in column 4 of the '995 patent describe the digitization of video?

A: Yes.

Q: I believe, going back to audio, that you told me that the digitization of the audio was not something that you would call compression. Is that true?

A: It is not something that I would call compression, but it does define what it is that we will compress.

If we're going to take one sample per second or 88,000 samples per second, that impacts decisions that will be made about what algorithms will be used and how fast things need to be, how many chips one would need, for example.

Q: Is it similarly true for video that you believe that the digitization of video that's

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described in paragraph, I'm sorry, lines 32 through 62 in column 4 is not itself compression of the video?

A: Digitization itself is not compression.

Q: So is it accurate to say that what is described between lines 32 and 62 in column 4 is not describing compression of video?

A: It does not describe compression but "it makes implications about" is almost too weak. It has strong implications.

What is performed in those two paragraphs has strong implications for specific design decisions and performance of the algorithms. So from the standpoint — you know, if you just said, "Can you compress video for me," my first question might be what is the frame rate, what is the bit depth, what is the format. That's integral in describing what is, what is done.

Q: So in the case of both audio and video, the digitization process is not itself compression but it has strong implications on the choices that one makes when one subsequently does the compression, is that accurate?

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A: Yes. It can have strong implications and it certainly informs a designer as to which choices he or she may make or may choose to ignore.

Q: Okay. What led us down that tangent was an attempt to get a complete list of the places where compression algorithms are described in the '995 patent and I had given you a list, which I believe you told me was accurate and I just want to confirm that. So here's the question.

Is it accurate that the complete list of compression algorithms that's described in the '995 patent is, one, the various algorithms at lines 65 and 66 on column 4, two, the CCITT Group IV compression algorithms at the top of column 5, three, the class of inter-frame compression algorithms described between lines 9 and 18 in column 5 and, four, the conventional algorithms described as being used with audio data at line 34 of column 5 and the Fibonacci delta compression algorithm in line 35 of column 5?

A: Yes.

MR. BROWN: Les, what time is

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it?

MR. PAYNE: It's about 12 after. Are you at a good place?

MR. BROWN: This is a good place to stop for lunch. It's close to 12:15. I think we should do that.

THE VIDEOGRAPHER: The time is now 12:11. This marks the ending of tape number two. Off the record.

(Luncheon recess: 12:11 p.m.)

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AFTERNOON SESSION

THE VIDEOGRAPHER: The time is now 12:51. This marks the beginning of tape number three. On the record.

SHEILA S. H EMAMI, having been previously sworn, resumed and testified further as follows:

EXAMINATION (Cont'd)

BY MR. BROWN:

Q: I want to go back to your CV for a moment. On page 69, there is a heading there which we discussed earlier, "Other Expert Witness Consulting," which I believe you said would be more accurately phrased as, "Other Expert Witness Testimony," correct?

A: Yes.

Q: Was that section of your CV added particularly for the purpose of presenting your CV in the context of this expert report?

A: Yes.

Q: Did you do anything else to your CV particularly for the purpose of including it as an attachment to your expert report?

A: I have multiple CVs. I have one for

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the department which includes every single committee I've ever sat on in my life.

I have another one which doesn't include departmental level but which includes all of the invited lectures I've given around the world and I think it would be fair to say I synthesized this CV by removing things that I didn't feel would be relevant, like departmental committees and also the very, I don't think I included my list of lecture, you know, invited presentations which is quite lengthy and not, I didn't feel was relevant.

Let me see if there's anything else that's — I also, I think they — material gets listed in different orders depending on who the, who's consuming the CV so I may have, this may be a rearranged order of headings that are common relative to say the CV I give to my department.

Q: Okay. But is it true that the only material that was added as opposed to rearranged is the section "Other Expert Witness Consulting"?

A: That is accurate.

Q: Okay. Let's go to page 16 of your expert report.

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There's a paragraph, it's the last paragraph on this page which begins, "Any compression procedure is described by an algorithm." Do you see that?

A: Yes.

Q: And you go on to give a definition of "algorithm" in that sentence, correct?

A: Yes.

Q: Is that the sense in which you've been using the word "algorithm" in the testimony you've given so far today?

A: So here I say it is "broadly defined as a procedure for solving a problem or accomplishing some end."

So I believe that in the context of a compression algorithm as we have used it to refer to putting something in and getting something out which is smaller, the first definition, "procedure for solving a problem" is appropriate.

"Accomplishing some end" is accurate, I think, for, I think, I maybe described a sub-algorithm or an algorithm can consist of sub-parts, each individually, which we could say

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was an algorithm or implemented an algorithm. So I think that this is accurate.

Q: Okay. Is it true that this sentence in your expert report accurately defines the meaning of "algorithm" to you in the context of this case and the Burst patents?

A: Well, when I wrote it, I was writing it for the, for the paragraph, you know. I put it in because I wanted to discuss algorithm, excuse me, implementations. So, therefore, I wanted to, since "algorithm" is potentially a technical term, I wanted to provide some context for what I meant by "algorithm."

Q: And what you mean by "algorithm" is a broad concept that includes a procedure for solving a problem or accomplishing some end. Is that right?

A: Yes, where the problem or end may be at a very large scale or at a very minute scale, say, to rearrange numbers in a sequence or along a grand path of doing some broader exercise.

Q: The paragraph goes on to describe ways in which algorithms can be implemented, correct?