UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

YEALINK (USA) NETWORK TECHNOLOGY CO., LTD., and YEALINK NETWORK TECHNOLOGY CO., LTD.,	:	
Petitioners,	:	Case No. IPR2024-01436
vs.	:	
BARCO N.V.,	:	
Patent Owner.	:	

DEPOSITION OF KEVIN C. ALMEROTH, Ph.D.

Santa Barbara, California

Monday, June 30, 2025

Stenographically Reported by:
JUSTYNE N. JOHNSON
RPR, CSR. No. 14301

Job No. 585237

Pages 1-142

BARCO EXHIBIT 2006
Yealink v. Barco
IPR2024-01438

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3 The Deposition of KEVIN C. ALMEROTH, Ph.D., was taken
4 on behalf of the Patent Owner, at 1111 East Cabrillo
5 Boulevard, Santa Barbara, California, beginning at 8:19
6 a.m., Pacific time, on June 30, 2025, before JUSTYNE
7 JOHNSON, RPR, Certified Shorthand Reporter No. 14301.
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22 ALSO PRESENT:
23 Kevin Greenleaf, Esq., Dentons US LLP (via Zoom)
24
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2 WITNESS EXAMINATION

3 KEVIN C. ALMEROTH, Ph.D.

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1 EXHIBITS
2 (None)
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5 WITNESS INSTRUCTED NOT TO ANSWER
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1 Santa Barbara, California
2 June 30, 2025 | 8:19 a.m.
3
4 THE STENOGRAPHER: Good morning. We are going on
5 the record at 8:19 a.m. on Monday, June 30, 2025, in the
6 matter of Yealink (USA) Network Technology Co., Ltd., et
7 al., v. Barco N.V., Case Number IPR2024-01436. Today's
8 deposition is taking place at 1111 East Cabrillo
9 Boulevard, Santa Barbara, California.
10 My name is Justyne Johnson. I am a California
11 certified shorthand reporter representing the firm Planet
12 Depos, and my certification number is 14301. The deponent
13 is Kevin C. Almeroth, Ph.D.
14 Counsel, can you please introduce yourselves.
15 MR. HALVERSON: Erik Halverson of K&L Gates on
16 behalf of Barco N.V., the patent owner.
17 MR. YANG: Stephen Yang from Dentons,
18 representing Yealink and the witness. With me today is
19 Kevin Greenleaf, also from Dentons.
20 THE STENOGRAPHER: Dr. Almeroth, can you raise
21 your right hand, please?
22 ///
23 ///
24 ///
25 ///

1 KEVIN C. ALMEROTH, Ph.D.,
2 having first been sworn by the Certified Shorthand
3 Reporter, was examined and testified as follows:
4 THE WITNESS: Yes, ma'am, I do.
5
6 EXAMINATION
7 BY MR. HALVERSON:
8 Q Good morning, Dr. Almeroth.
9 A Good morning.
10 Q Good to see you again.
11 A Yeah. Thank you.
12 Q You got three documents in front of you. The
13 declaration in this proceeding, which has been marked as
14 Exhibit 1002; the patent in this proceeding, which has
15 been marked as Exhibit 1001; and your CV, which I believe
16 is consistent across all of the proceedings, which has
17 been marked as Exhibit 1003.
18 As you can see behind me, we've got a bunch of
19 paper. If you think there's something else that you need
20 that would be helpful for a question or for an answer,
21 excuse me, just ask. Happy to go find it.
22 A Okay.
23 Q Starting with Exhibit 1002, your declaration, can
24 you confirm for me that that's the declaration you
25 prepared and submitted in this proceeding?

1 A It is.
2 Q And you see your signature on it?
3 A I do. Last page.
4 Q Excuse me.
5 What's a driver?
6 A It depends on the context.
7 Q What does -- what do you mean by that?
8 A Well, you can think of an Uber driver or you can
9 think of a computer driver. Different kinds of computer
10 drivers, which would be the ones probably more relevant to
11 this case than, say, an Uber driver.
12 Q So if we set aside the Uber driver and we instead
13 focus on the computer drivers, is there additional context
14 there that you would need to answer my question?
15 A Yes.
16 Q What kind?
17 A Context would be the claim in which the term
18 would appear and then what the specification would say
19 about what a driver is.
20 Q So setting aside the specific use of, for
21 example, generic preinstalled driver in the context of the
22 '802 patent, in your experience as a doctor in this area,
23 what's your understanding of what a computer driver is?
24 A So outside of the scope of this IPR, it's still
25 going to depend. There can be different kinds of drivers.

1 Generally, the examples that come to mind would be things
2 like printer drivers, essentially providing the link
3 between the computer and an external device, for example.
4 So the code that would essentially translate the computer
5 instructions into instructions that were specific to the
6 particular printer or whatever device is being connected.
7 Q So you used printer there in that example. Is
8 that just one of the more readily ascertainable or
9 accessible types of hardware that you could think of that
10 uses a driver?
11 A No.
12 Q Does a mouse -- a wired mouse have a driver?
13 A It can.
14 Q If it didn't, how would it communicate with the
15 connected machine?
16 A Depends on how it's connected. In some cases,
17 they can be directly connected. Part of a keyboard. But
18 they don't necessarily need drivers.
19 Q Does the keyboard in my laptop have a driver that
20 it uses? I don't know if you need something to be able to
21 see more of it.
22 A Likely, it does.
23 Q And so you use the phrase "translate code" to
24 translate to a specific device, something along those
25 lines. Do you remember --

1 A Something along those lines.
2 Q What is being translated?
3 A Depends on the system, depends on the device,
4 depends on the action. As an example, you could have a
5 mouse click that would be translated into an event of some
6 kind that the mouse had been clicked.
7 Q And why do drivers exist?
8 A In a general sense, drivers exist to facilitate
9 the connection of different pieces of equipment into a
10 computer. You know, you've used examples of printers.
11 There could be drivers for displays, keyboards, mice.
12 Basically any kind of device you'd want to connect to a
13 computer would typically have a driver.
14 Q And so are those drivers specific to those
15 devices?
16 A It depends.
17 Q So from this conversation, it sounds like the use
18 of the driver is very situational dependent; is that
19 fair -- or device dependent?
20 A No. I think the use of drivers, either specific
21 or generic, are pretty widespread, pretty common, pretty
22 well understood in terms of connecting different types of
23 equipment into a computer or to a computer. And there are
24 certainly different types depending on classes of
25 equipment. In some cases, you could have drivers that are

1 specific to -- you know, like a camera that would attach
2 to a computer would have a specific driver associated with
3 that camera make and model.
4 Q So I guess what I'm trying to figure out is,
5 devices can communicate with each other without drivers;
6 right?
7 A You'd have to be more specific on what devices,
8 what kind of communication. I mean, if devices are two
9 computers, they can communicate with each other.
10 Typically they would communicate with each other via some
11 communication interface and, often, there would be a
12 driver between the -- or within the computer to connect
13 that communication interface.
14 Other examples of a device, I mean, if -- once
15 you get beyond the context of computer devices, I don't
16 know, like two CB radios communicating with each other
17 probably don't need a driver. So depending on how broadly
18 you're applying the term "device," there can be instances
19 where you don't need computer drivers to facilitate
20 communication.
21 Q So Mr. Greenleaf, who's remote via Zoom today,
22 the communication path between his ability to see you
23 on -- in this room and what he sees on his screen in his
24 room passes through approximately how many drivers, would
25 you say?

1 MR. YANG: Objection to the form of the question.
2 You can answer.
3 THE WITNESS: There would be a driver from the
4 camera capturing the input. There would also be,
5 potentially, separate drivers between the microphone and
6 the computer. Depends on the configuration. They're
7 pretty well understood that you can do it as an integrated
8 device or separate hardware components. There would be
9 drivers to the wireless interface. And then it's
10 transmitted over the air to an access point. That access
11 point would have its own set of drivers. Routers on the
12 path would have their own set of drivers. It could be a
13 dozen or more drivers, depending on the number of hops in
14 the communications path. And then there's a mirror for
15 whatever computer or equipment he's using to receive the
16 video and display it and hear the audio as well.
17 BY MR. HALVERSON:
18 Q And so I think we hit the video drivers there.
19 Would those be specific to the camera in the laptop or
20 would those be a more generic? And now I'm in the -- in
21 the context of a patent, trying to figure out the
22 distinction between a generic driver and nongeneric
23 driver.
24 A Yeah. So there's two parts to that question.
25 There's kind of the "what makes it generic." And there's

1 claims construction around that. And there is a
2 particular paragraph. And this is in paragraph 72, page
3 47. I won't read it, but it's got some descriptive
4 language on what distinguishes a specific driver from a
5 generic driver. Generic drivers are generally applied to
6 classes of devices as opposed to a specific driver for a
7 peripheral device.
8 Okay. So then the second part of your question
9 is would there be a specific or a generic driver for -- I
10 think you said the camera in the laptop.
11 Q Yep.
12 A The way my laptop is configured, it's a built-in
13 camera. I suspect the driver would be specific to that
14 make and model of the camera. It's not, for example, a
15 UCSB -- or excuse me -- a USB-connected camera that might
16 use a generic driver. So both are pretty common depending
17 on the camera and the way the camera is connected to the
18 computer.
19 Q And so one thing that you used in that answer was
20 a class of devices. Do you recall that?
21 A I do.
22 Q What do you mean by "class of devices"?
23 A That is terminology that's used in the '002
24 patent. Part of what it says is, such a driver is
25 standard for the operating system and can drive a standard

1 class of peripheral devices coupled to or connected to the
2 processing device. Comes from column 14, lines 32 through
3 46, in part. So I'm using that language from the
4 specification.
5 Q And so some of those examples of classes that it
6 gives there, are they human interface driver, HID, or a
7 mass storage device driver, MSD [sic]? Do those terms or
8 acronyms sound familiar?
9 A Yes.
10 Q And so is it your understanding that a human
11 interface driver is different than a video driver?
12 A It's a different term. Potentially, they could
13 overlap in terms of whether or not a video driver would be
14 a human interface driver. It may be an example as a video
15 screen that's also touch sensitive, and so can be
16 presented using a human interface driver to interface with
17 that particular device, even though it would be
18 categorized as a video device.
19 Q Now, one of the other things that you gave in
20 that couple of answers ago was you were distinguishing the
21 integrated video camera of your laptop from a stand-alone
22 connectible camera. Do you remember that?
23 A I do. I said it may be implemented that way. I
24 don't -- I'd have to go look and see what driver it uses
25 for the integrated camera. Maybe it's generic. Maybe

1 it's specific to a make or model. I'd have to look at the
2 driver.
3 Q And then for the stand-alone camera that may be
4 attached via -- I think you gave USB as the example; is
5 that right?
6 A Yes.
7 Q That would use a USB driver; is that right?
8 A If -- it's something of an incomplete
9 hypothetical and so it becomes somewhat circular. But if
10 that's the scenario where it's using the USB driver, then
11 that's the scenario.
12 Q Would you also need to use a video driver in
13 addition to the USB driver for a standalone camera,
14 assuming it was a USB-connected device?
15 A It depends. Using an additional driver or not,
16 depending on the functionality of the camera and how it's
17 being mounted, either of those could be possible choices.
18 Q And I think in the example of the connection
19 between us and Mr. Greenleaf, in addition to the video,
20 you had also talked about an audio driver for the sound
21 that he's hearing; is that right?
22 A I did. The microphone on this end and then
23 whatever output mechanism he's using on the other end.
24 Q And so in your Dell laptop here, do you know is
25 that audio driver a generic driver or a specific driver

1 for either the sound card in your machine or the mic and
2 speakers in your machine or wherever else it may sit?
3 A My recollection is it's a specific driver to the
4 make and model of the microphone.
5 Q And are you familiar with standalone connectible
6 microphones?
7 A Yes.
8 Q And so for something like that, would that use a
9 generic driver or a specific driver for that microphone?
10 A Both are options. Both would be pretty well
11 understood as possibilities. You can have a USB-connected
12 speaker. That would use a generic driver, generic USB
13 driver for that class of device. Or you could have
14 something that was specific to a make and model,
15 potentially a driver provided by a manufacturer, as
16 something that would be more specific than the USB driver.
17 Q And so in paragraph 72, the portion of the '002
18 patent that you've quoted, there are a couple of examples
19 of what the '002 patent considers to be generic drivers,
20 and I think we touched on them briefly, the HID and the
21 MSD -- MSDD. Excuse me. Do you recall that?
22 A I do. Those are two examples that the patent
23 identifies.
24 Q Are those terms that you were familiar with
25 before your work on this case, human interface driver or

1 mass storage device driver?
2 A Yes.
3 Q And did you understand those to be generic
4 drivers before your involvement in this case?
5 A I understood what they were. Whether I would
6 have applied the term "generic" versus "specific," I don't
7 recall an instance where I would have heard them called
8 generic drivers. But it's a pretty straightforward
9 dichotomy.
10 Q What do you mean by that, it being a pretty
11 straightforward dichotomy?
12 A The way the '002 patent lays it out is it's
13 either got a generic driver or it's a specific driver. It
14 doesn't really introduce other types of drivers. And it
15 describes a generic driver as applying to a class of
16 devices, and then it gives some examples.
17 So the idea that there were drivers that the
18 patent characterizes as generic drivers, preinstalled or
19 not, was something that was pretty ubiquitous. By at
20 least 2010, the USB standard had been out for more than a
21 decade. It had those classes of -- of driver types. And
22 then there were certainly specific drivers that were
23 specific to particular devices and makes and models.
24 You know, Windows from '95, if not earlier, had
25 the whole menu where you would want to install a printer

1 and you would select the manufacturer and then the printer
2 model and then it would use the -- the driver for that
3 specific make and model.
4 So those -- those concepts were known. Whether
5 or not there was kind of this established definition of
6 one as a generic driver and then you have specific
7 drivers, that's kind of what my point was. It's a
8 pretty -- pretty basic distinction between the types of
9 drivers that existed --
10 Q Okay.
11 A -- for a decade.
12 Q Have you ever heard of a mirror driver?
13 A I have.
14 Q Is a mirror driver a generic driver or a specific
15 driver?
16 A It could be either, depending on how the system
17 is implemented. The idea of a mirror driver could be done
18 fairly generically. But you could also design a mirror
19 driver for something -- like a specific product.
20 Q How would you do it, generically?
21 A Where it's not specific to a particular make and
22 model of the device where there would be some standard set
23 of commands that would be able to be issued by a device
24 that had been identified as some sort of mirroring device
25 or pulling data, scraping data from a device to be

1 mirrored. And so you can use a generic set of commands
2 that wouldn't be specific to a particular kind of device.
3 Q Can you envision a situation or a scenario --
4 excuse me -- where it would be -- the mirror driver would
5 be device agnostic?
6 A I could envision a driver that would mirror
7 whatever was intended to be mirrored to be agnostic of a
8 particular device, that it wouldn't need commands that
9 were specific to a make and model of the particular device
10 that was being mirrored.
11 Q And so the way -- I guess, maybe a series of
12 precursor questions: What is a mirror driver?
13 A My understanding of a mirror driver, at least in
14 the scenarios I've heard about it, is where it's able to
15 take some set of data being directed to a particular
16 output device and copying that data for delivery across
17 another device as well.
18 Q And so that would operate on one machine; right?
19 A The mirror functionality would be within one
20 machine, typically.
21 Q And then in addition to the human interface
22 driver and mass storage device driver in paragraph 72, are
23 you familiar with any other generic drivers?
24 A I have to go back to check the USB standard that
25 has a whole class of generic drivers and USB

1 specification. You could do sort of generic drivers for
2 input/output. I think you can also have generic drivers
3 for audio devices. I suspect you could do generic drivers
4 for printers, or it's either PCL or P -- PS.
5 So I think there -- there would certainly be
6 other classes or other drivers that would apply to classes
7 of peripheral devices, kind of as the '002 patent
8 characterizes what a generic driver is.
9 Q And forgive me. What is PCL and PS?
10 A PS is postscript. PCL is -- I don't remember.
11 Maybe it's, like, print conversion language. They're --
12 they're basically standards that can be supported by a
13 whole range of different kinds of printers. So instead of
14 having a driver that was specific to a command set for a
15 particular printer, the printer would have PCL or
16 postscript, PS, installed on it. And so the commands
17 would be printer commands but generic to the class of
18 devices of printers and not limited to just one type of
19 printer or one make and model of -- of a printer.
20 Q And so why -- wh- -- what is the benefit to a
21 printer company from having a device-specific driver for
22 their printer?
23 A I -- so there are advantages. Generally, the
24 idea of there being printer-specific drivers was more
25 because there wasn't a standard, like PCL or PCS, that

1 existed, which is why if you -- you know, kind of in the
2 mid 90s, if you brought -- bought a printer and wanted to
3 link it to a computer, you'd have to go through either the
4 inst- -- the preinstalled menu of drivers and select the
5 printer and the make and model. Or if it wasn't in that
6 list, then you would get a P -- at that time, you'd get a
7 diskette that would have the printer driver on it.
8 But in terms of there being advantages,
9 sometimes, if it's specific functionality for a specific
10 device -- a camera has advanced features that aren't
11 common to cameras and those are things that you would want
12 to use a piece of software on the computer to be able to
13 access or control, then you would need something that was
14 a specific driver; as opposed to functionality, that would
15 be common across a whole range of devices, where you would
16 use a generic driver.
17 Same thing for a printer. Right? If you've
18 got -- you know, at one point in time, whether or not you
19 could double -- double-side print wasn't a standard
20 feature. And so you'd need a specific driver to be able
21 to support that feature. As it became more common and got
22 installed in -- in PCL and PS, then you could fall back to
23 a -- a generic driver. But if you had some fancy printer
24 with advanced functionality, there would be advantages to
25 having a -- a specific driver.

1 Q And then what is it about computer mice that
2 lends them to specific drivers? Every time you plug in a
3 new mouse, you've got to install the driver for that
4 mouse.
5 A I'm not sure I would agree with that
6 characterization that you have to -- I mean, the driver
7 would already be installed. You're activating the driver.
8 You know, for example, if you take a USB mouse and you
9 plug in a USB mouse into your computer, it doesn't really
10 have to install a driver. The driver's already there. It
11 would use the driver that was already there.
12 I actually thought you were going to ask the
13 question in the other direction in the sense that mice
14 tend to be pretty simple devices. They have a very
15 limited command set, and so they more lend themselves to
16 the use of generic drivers.
17 Obviously, I could think of a modified mouse,
18 say, for a person who is handicapped. And so it would
19 have specific functionality that wouldn't be generically
20 supported through, say, USB. That would be an example of
21 where you might have a -- a driver specific to that brand
22 of ma- -- of mouse.
23 Q So if you had some sort of unique
24 functionality -- or I don't want to use "next level" --
25 but a -- a more abnormal set of functionality for a given

1 device, you may benefit from having a device-specific
2 driver, as opposed to a more generic driver?
3 A It's -- it's almost better defined in the
4 inverse, which is, if it's not functionality that would be
5 part of a standard device driver, then there might be a
6 need for something specific. It's also the case, though,
7 that even for a device like that, you can get the basic
8 functionality using a generic driver as well. You know,
9 so it's -- it's kind of interesting. You can connect your
10 iPhone to a laptop via USB and treat it as a mass storage
11 device and get access to the folders. You can't do all of
12 the other things that you can do when you try and sync
13 your -- your device. That would require something more
14 specific. But you can treat it as a mass storage device
15 and access the functionality enabled through that
16 interface, even though that might not be all the
17 functionality that it could support.
18 Q And so the cell phone example is -- is a good
19 one?
20 A Mm-hmm.
21 Q 'Cause you plug in your iPhone, and you have got
22 to choose how you want it to be viewed by the computer;
23 right?
24 A Sometimes you can choose.
25 Q And so when you don't select mass storage device,

1 you could you get access to certain functions of the
2 phone?
3 A If you don't select mass storage device, it
4 depends on how the system is set up. You can get access
5 to an even more limited set of functions. Or if it's been
6 synched before, you might get it -- a more sophisticated
7 level of functionality. It depends.
8 Q And it... And how do you differentiate a driver
9 from just a software application?
10 A Generally, I would look to what the driver or
11 what the piece of software is doing. I suppose you could
12 have something that acts like a driver that isn't called a
13 driver. They're -- they're kind of loose terms. I don't
14 know that there's necessarily a specific definition of one
15 versus the other.
16 Q And so you would use the word "translate" earlier
17 to describe what it was the driver did.
18 When you said look to what the code itself is
19 doing, is the -- the act of translating something that
20 would help identify a driver versus just a generic
21 software application?
22 A I think you got the characterization right
23 towards the end of your question. It's one example of --
24 of what can be done. There may need to be a translation
25 function depending on the software interfacing with the

1 driver and what the driver has to produce. So that's one
2 thing that may happen. I don't know that it's dispositive
3 of what makes a driver a driver, though.
4 Q And I guess, is there a distinction in your mind
5 between what a driver is and what a software application
6 is?
7 A Well, certainly, a software application can be
8 something other than a driver.
9 Q And so is it a Venn diagram?
10 A I suspect you could do a Venn diagram.
11 Q Would you do it as a Venn diagram?
12 A I would not.
13 Q Okay. So how do you distinguish the two?
14 A I'm not -- I don't understand the question.
15 So -- I mean, one is something more specific than the
16 other.
17 Q Ah. So is one subsumed in the other? Are all
18 drivers software applications, in your mind?
19 A Typically, they are software. Whether or not you
20 could have a firmware driver or a hardware driver, I -- it
21 might be possible, depending on the system.
22 Q And then, so I asked the question using software
23 application, and you responded with "it could be
24 software."
25 Is there a distinction between software and a

1 software application, in your mind?
2 A Not in the context of how you've asked the
3 question.
4 Q In what context is there a difference?
5 A You can have software that's not an application.
6 Q Can you give me an example of that?
7 A Software to perform a CRC check on a received
8 packet.
9 Q And why is that not an application?
10 A In a general sense, applications, generally, are
11 user facing. Apps, applications. What immediately comes
12 to mind is things like Word or Excel or a calculator or
13 something like that. Depending on the context, the use of
14 the term may app -- the use of the term "application" may
15 create a distinction like that, or it may not. Again,
16 it's -- I don't know that there's some rigid standardized
17 definition. It depends on context.
18 Q Are you familiar with the phrase "plug and play"?
19 A Yes.
20 Q What is plug and play?
21 A Well, there's universal plug and play. So
22 there's a protocol or a system standard for universal plug
23 and play that dates back, I think, to the mid 2000s. And
24 then there's kind of plug and play as a marketing term,
25 and then there's kind of plug and play as a technical

1 term.
2 But it's -- it's kind of -- at the common level,
3 it's the idea you can -- you can plug something in and, at
4 least from a user perspective, it -- it works, that
5 there's not a -- a lot of or a significant amount of or a
6 complicated user-involved configuration that needs to take
7 place.
8 Q Is it -- sorry. I didn't mean to cut you off.
9 Were you --
10 A Done.
11 Q Is it your understanding that plug and play still
12 requires some degree of subsequent user configuration?
13 A It depends. The -- again, there's not really
14 some definition of plug and play that would create a
15 requirement at the level of specificity for your question.
16 Again -- you know, again, as I mentioned, it can be used
17 as a marketing term. You can use plug and play as a
18 marketing term and, in practice, it still requires some
19 user involvement. I don't think the standard limits or
20 says whether or not you can have user involvement or not.
21 You can check the standard. See -- see what it says. And
22 so, ultimately, I don't think that there is some
23 standard-based definition of plug and play that would be
24 able to answer your question one way or another. It
25 depends on the situation.

1 Q And universal plug and play, is that unique to
2 networking?
3 A It -- it depends.
4 Q I'm sensing a theme.
5 A Yeah.
6 Q The reason I ask is because I've only ever seen
7 it in the context of IP device detection, and I'm
8 wondering if there is a broader use case for it.
9 A I've seen the term "plug and play" applied to,
10 you know, like cameras being connected to a computer via
11 USB.
12 Q Sorry. Perhaps a slightly cross set of wires. I
13 have seen plug and play used there. But universal plug
14 and play, the standard that you had mentioned earlier,
15 have you seen that outside of the networking context?
16 A I haven't looked at that standard in the context
17 of this declaration to my recollection. But whether or
18 not you can use UPnP in a non-networked wired scenario,
19 I'd have to check.
20 Q Okay. But as you sit here today, what you
21 recollect UPnP being used for is a wireless detection
22 protocol?
23 A Often it is used in a wireless context. I can't
24 really say more without going back and reviewing the UPnP
25 spec.

1 Q And I don't think you cited it. Do you recall
2 using it in this proceeding? Is it in one of those boxes
3 (indicating)?
4 A I don't think it was part of state of the art.
5 But it's certainly something a person skilled in the art
6 would have been familiar with. To the extent there's some
7 relevance given the wireless aspect to it, I don't think I
8 specifically identified it. But you know, I'll sort of
9 have to see what happens with the patent owner response.
10 Q Can't wait.
11 Are you familiar with wireless modems?
12 A Yes.
13 Q What's a wireless modem?
14 A It's a pretty generic term. Depends on the
15 context. It could either mean wireless on either side of
16 the interface in the sense of 80211 is a wireless modem.
17 That's probably the more common use. But whether or not I
18 could do Bluetooth or infrared to the modem and then wired
19 or wireless from there is -- I -- there's, I think,
20 products in the market that could be wireless in both
21 parts of the device.
22 Q Go to paragraph 92.
23 A Okay.
24 Q About second sen -- well...
25 A Go ahead. I was just --

1 Q Context. Yeah.
2 A Yeah. Looks like Deforche.
3 Q About second sentence, paragraph 92, there's a
4 sentence that begins "Deforche recognized."
5 Do you see that?
6 A Yes.
7 Q So in there, this sentence refers to a wireless
8 modem device and the communication link between...
9 THE STENOGRAPHER: The what and the computer?
10 MR. HALVERSON: That and the computer. Sorry for
11 trailing off.
12 BY MR. HALVERSON:
13 Q Have you reviewed Deforche?
14 A I did. I have.
15 Q So when I refer to wireless modem, that's what
16 I'm referring to as the wireless modem of Deforche.
17 A Okay.
18 Q And so in that context, does the wireless modem
19 require a driver?
20 A It does. In its role of being connected to the
21 computer device.
22 Q And I can get Deforche, if you'd like.
23 A Okay.
24 Q Would that be helpful?
25 A Sure. Exhibit 1030.

1 Q Thank you.
2 MR. YANG: Thank you.
3 MR. HALVERSON: One for you.
4 Can you read the last answer?
5 THE STENOGRAPHER: "Sure. Exhibit 1030."
6 MR. HALVERSON: Last two answers.
7 THE STENOGRAPHER: Answer: "It does. In its
8 role of being connected to the computer device."
9 BY MR. HALVERSON:
10 Q All right. And so in that role, what do you mean
11 by that -- sorry. Let me start over. What do you mean by
12 "its role of being connected to the computer device"?
13 A So the quote specifically here is there's a need
14 for a specific driver for the communication between the
15 wireless modem device and the computer device. So within
16 the figure, there's a wireless modem device and then
17 you've got a computer device and you'd need a driver to
18 interface those two things or connect those two things
19 together.
20 Q And based on your review of Deforche, is the
21 wireless modem of Deforche unique to Deforche or is it
22 describing the type of wireless modem that a person could
23 purchase from, for example, Target or Best Buy?
24 A I'm not sure I understand the two options within
25 the "or." They seem to be overlapping.

1 Q Ah. So I can go to the store and buy a wireless
2 modem that sits at the entry point to my house, generates
3 a demodulated internet signal that I can then use with a
4 router to create a Wi-Fi network in my home; right?
5 A You can.
6 Q I can also -- did you want to go on? Sorry.
7 A Just briefly. I think that it -- it would create
8 a demodulated signal, but it would generally be integrated
9 with something else or connected. I mean, so coming into
10 your house, something like a DSL modem or a cable modem
11 probably would be an integrated device, would have a Wi-Fi
12 point. So that -- the modem would specifically do the
13 demodulation as part of something else, and I think you
14 got the something else in there.
15 Q And by that, are you referring to, for example,
16 the box that you can get from your ISP today that is an
17 integrated modem and router so you no longer need two
18 separate components?
19 A Correct. It can be integrated or not. And to be
20 clear, even if -- so in the situation where it's not
21 integrated, you do demodulation on the incoming side and
22 then you'd probably remodulate to send it to whatever
23 device is separate, if it's separate. So, I mean, that
24 might actually come out as Ethernet. And so I got the
25 demodulation part kind of on the inbound side. That's

1 what it would do.
2 Q And then, is there also a wireless modem in my
3 given laptop that will demodulate the remodulated
4 transmitted signal?
5 A I can envision a scenario where that would be the
6 case.
7 Q And so is Deforche's wireless modem device that
8 is usable on a computer device without driver installation
9 and reading the title of Deforche (phonetic) there, 54, is
10 that the box and entry point to your home or is that the
11 integrated chip in your computer? Or something else?
12 A I would think the scenario is more consistent
13 with kind of the second option, where you're really
14 talking about they have a personal computer and a driver
15 that would be used to facilitate communication with the
16 wireless modem. You said it was an integrated chip. And
17 it certainly could be an integrated chip. But I think
18 it's more about -- or not as an integrated chip.
19 Q And so if you flip to figure 4 of Deforche
20 (phonetic), there's a flowchart that spans 4A, 4B, 4C, and
21 that's it. 4C. Yep.
22 You see that?
23 A I do.
24 Q So kick-off step here is "user inserts stick."
25 Does that help inform whether or not this is on the

1 computer side or the entry point side of our modem
2 discussion?
3 A It's not my recollection that Deforche would
4 limit the scenario. And so, I mean, I could envision a
5 box that you get from Comcast or a cable company or
6 Verizon where you would also be able to insert it --
7 insert a stick on the inbound to the house. I don't think
8 Deforche limits it. But I think the scenario where we're
9 talking about running a Windows operating system is more
10 aligned with a scenario where it's, say, a user's
11 computer.
12 Q What's the difference between a modem and a
13 transceiver?
14 A Transceivers transmit a receiver. Modems,
15 modulators, demodulator, transmitters, transceivers can do
16 modulation/demodulation, which is based on the term, not
17 necessarily same thing for modulator/demodulator. Though
18 modems generally also transmit and receive. So it depends
19 on how pedantic you're being with respect to the
20 application of those terms versus the application of those
21 terms to -- as functions to a particular device.
22 Q Go to paragraph 68 for me.
23 MR. YANG: In the Deforche, Counsel, or his
24 declaration?
25 MR. HALVERSON: That's a great question.

1 BY MR. HALVERSON:
2 Q Can you go back to Exhibit 1002, which is your
3 declaration, and go to paragraph 68?
4 A Okay. I'm there.
5 Q Have you reviewed the claim construction briefing
6 or decision in the EDTX case since you went -- submitted
7 this declaration?
8 A I have.
9 Q Are there any changes that you would propose
10 making to anything in your declaration based on that
11 review?
12 A Not in the declaration. I think the positions
13 I've taken in the declaration apply under the way that the
14 declaration describes the terms. It's not my
15 understanding, as part of the preliminary patent owner
16 response, that the patent owner proposed any terms for
17 construction that would change my opinions. I'll have to
18 see what the patent owner response says to see if there is
19 a claimed construction issue that gets raised.
20 Q So in paragraph 68, you refer to 35 USC 112F. Do
21 you see that?
22 A I do.
23 Q What's your familiarity with 112F?
24 A In essence, what's described here in terms of the
25 presumption that something that says "a means for" is to

1 be interpreted using 112F. That's not the limit of where
2 the means-plus-function type of claiming can be applied.
3 I think there's some additional discussion around some of
4 the terms in the limitation by limitation walk-through
5 itself. And then within 112F, there's an identified means
6 and then a particular structure for performing the
7 function. And then you would get equivalence as of the
8 date of publication.
9 Q So let's go to paragraph 76, I guess the first
10 line in this.
11 A Okay.
12 Q Here we've got "means for coupling." Do you see
13 that?
14 A Yes.
15 Q And I guess as a precursor question to that, can
16 you open up the patent '002, which is Exhibit 1001, and
17 I'll look at claim 1 for a second.
18 A Okay.
19 Q So step B of claim 1. Read that for me.
20 A "Setting up by means of a first preinstalled
21 generic audio driver of the operating system, a means for
22 audio communication between the peripheral device and the
23 processing device and by means of a second preinstalled
24 generic driver of the operating system, a means for data
25 communication between the peripheral device and the

1 processing device."
2 Q And so the word "means" appears four times in
3 that claim reference; right?
4 A I think that's right.
5 Q And when we were talking about 112F in paragraph
6 69, you refer to means 4. Do you see that?
7 A I do.
8 Q And only two of those four instances of the word
9 "means" in claim 1 are means 4; right?
10 A I think that's right, sir.
11 Q The other two are by means of; is that right?
12 A I see that language.
13 Q Did you apply 112F to the element by means of?
14 A Let's see.
15 Q And just short-circuit some of this, if you look
16 at paragraph 74 and 75.
17 A I do. And it does mention claim 1 and 11. But
18 what I was going to do is see what the specific element
19 said. My recollection is that the evidence that I cited
20 to discloses the limit -- discloses the element whether or
21 not you consider that the element should be interpreted
22 using 112F or not. So that, I wanted to confirm.
23 So for ground 1, that starts on page 62.
24 Q And I think the juice of that element is 68.
25 A Yes. And so my recollection is confirmed. It --

1 the analysis here applies whether or not you considered
2 any of those four to be 112F or not.
3 Q And can you tell me where in that element you
4 refer to the specification of the '002 patent?
5 A I don't understand the question. I'm identifying
6 where that element is met in the prior art. I don't
7 understand the role of pointing to the '002 specification
8 for what sufficience of disposal limitation in the prior
9 art ground.
10 THE STENOGRAPHER: In the prior art...
11 THE WITNESS: Ground.
12 But if there is a reference to the '002 patent,
13 then I would defer to what the declaration says.
14 BY MR. HALVERSON:
15 Q I don't -- I didn't see one, and so --
16 A Okay.
17 Q -- I just want to make sure that you don't see
18 one that I missed or intend there to be one that I'm not
19 catching.
20 A Generally, where I've referred to the
21 specification of the '002 patent, it was to show that the
22 disclosure of the '002 is similar to the disclosure that
23 was in the prior art or that the term was used in the same
24 way. I think I've done that in a couple of instances. I
25 don't recall if I did it here. You said you looked and

1 didn't see one. I don't see one in my brief skim. But I
2 think the declaration speaks for itself with respect to
3 any comparison with the specification as it relates to
4 interpreting the terms of 112F and then what the
5 associated structure would be.
6 Q And I -- I apologize. My control F was better
7 than me.
8 If you go to paragraph 110, which is in the
9 section I think we were looking at --
10 A Yes.
11 Q -- fifth line down, you see the '002 on the left
12 side of the margin?
13 A I do.
14 Q And so is that an example of what you meant by
15 referring to the '002 patents to describe what was
16 quote/unquote, "well known"?
17 A To be clear, I've described what's disclosed in
18 the ground and then, as further support, the description
19 of what's in the prior art. And using the prior art in
20 the way that I've identified it as part of the combination
21 is something that the '002 patent also recognized as
22 something that was well known. So it really is just the
23 icing on the cake, the confirmation that what I've
24 described, a person of skill in the art, would have
25 understood in the prior art. And the state of the art is

1 something that was consistent with what the '002 patent
2 describes.
3 Q If we can go back to paragraph 60 -- well, let's
4 start with 70. Let's go back to paragraph 70.
5 A Okay.
6 MR. HALVERSON: Actually, why don't we -- why
7 don't we take a break?
8 THE WITNESS: Okay.
9 THE STENOGRAPHER: Off the record at 9:19 a.m.
10 (Off the record.)
11 THE STENOGRAPHER: Back on the record at
12 9:59 a.m.
13 BY MR. HALVERSON:
14 Q Welcome back, Dr. Almeroth.
15 A Thank you.
16 Q Are you still at paragraph 70?
17 A I am.
18 Q Are you offering an opinion about the proper
19 construction of couple or coupling?
20 A You say "proper construction." I think
21 paragraph 70 speaks for itself in basically saying that it
22 shouldn't be interpreted to exclude devices that are
23 indirectly connected or coupled.
24 Q And so when you say "the paragraph speaks for
25 itself," what I see in that paragraph is an

1 introduction -- an introductory clause followed by a block
2 quote from the specification itself; is that right?
3 A In paragraph 70?
4 Q Correct. So if you look at la- -- column 15,
5 line 44 of the '002 patent.
6 A Okay.
7 Q Is there any text that is in paragraph 70, after
8 the word "the" -- or phrase "the term" that is not
9 verbatim from the '002 patent at the cited passage?
10 A I don't know that it -- that there is, but I
11 mean, you can do the comparison and see whether there is
12 or is not.
13 Q And so the reason I ask is it's -- I'm trying to
14 figure out: Are you offering any sort of opinion here or
15 just stating what the '002 patent states?
16 A I am agreeing with the '002 patent that the term
17 "coupled" should not be interpreted to be restricted to
18 direct connections only.
19 Q And so for subsection A, B, and C here, they take
20 the same format, where you state the '002 patent states
21 that. And then there's a block quote from the '002 patent
22 itself; is that right?
23 A I think that's right.
24 Q And so where you do that, that's intending to
25 indicate that you agree with the '002 patent; is that

1 right?
2 A That I agree that the description that the '002
3 patent provides in the specification is relevant to the
4 claims identified in the parenthetical following this
5 section heading.
6 Q Are there any passages of the '002 patent's
7 description of couple or coupling that you disagreed with?
8 A Sitting here right now, I don't recall that there
9 were any that were inconsistent with this statement.
10 Q How about for wireless or preinstalled generic
11 driver?
12 A Same answer.
13 Q And so how did you determine what fell within the
14 scope versus without -- sorry. Let me start over.
15 How did you determine what fell within the scope
16 versus outside the scope of preinstalled generic drivers,
17 as that term appears in section C?
18 A I don't recall there being any opinions in this
19 declaration as to what would fall outside of the scope.
20 It was a question of whether or not what was described in
21 the prior art that was the basis for the grounds was
22 something that would have been within scope of the
23 limitation.
24 Q So you're not offering any opinions about what
25 falls outside the scope of preinstalled generic drivers in

1 this declaration?
2 A I don't recall offering an opinion that there is
3 something specific that falls outside of the scope in the
4 declaration. If I'm misremembering, then I defer to what
5 the declaration says.
6 Q Have you offered claim construction opinions for
7 means-plus-function claim elements in the past?
8 A I have.
9 Q Order of magnitude, how many times? Single
10 digits? Double digits? Triple digits?
11 A At least a dozen. I suspect it's not triple
12 digits.
13 Q And so what's your understanding of the process
14 by which one goes through to construe a
15 means-plus-function term?
16 A Typically, you identify what the function is and
17 then look to the specification to determine what it
18 discloses, is the structure sufficient to perform the
19 function.
20 Q And so for means for coupling, in paragraph 76,
21 what is the function?
22 A This is claim 11. Coupling an external
23 peripheral device physically to a port of the processing
24 device.
25 Q Did you read that from somewhere?

1 A Claim 11.
2 Q And so when you were looking for structure in the
3 specification it performs, the function recited in
4 claim 11, at approximately lines 40 and 41, what were you
5 looking for?
6 A Something that would perform the function of
7 coupling an external peripheral device physically to a
8 port of the processing device.
9 Q And so you found the an -- I guess, I see
10 three -- sorry. I see four different passages cited here.
11 A Those are the ones that appear to relate to that
12 particular function.
13 Q And so what is the structure that you've
14 identified in the first portion of the block quote there?
15 A Those are the passages that appear to relate to.
16 So the aspects of what the patent describes as being
17 related to that structure are what I've cited to in the
18 remainder of paragraph 76. And that's what I used as a
19 guide in terms of determining whether or not there was the
20 same structure or equivalent structure disclosed in the
21 prior art.
22 Q And so when you did this analysis, were you
23 looking for structure in the prior art that performed the
24 same function or structure in the prior art that was the
25 same structure?

1 MR. YANG: Objection to form.
2 THE WITNESS: Per -- to perform the function
3 using the same or equivalent structure as whatever was
4 related in the specification.
5 BY MR. HALVERSON:
6 Q The same exercise that you did for the terms in
7 section H, I, J, and K?
8 A Yes.
9 Q So we were looking at means for coupling in
10 paragraph 76, and you identified a function, and you
11 identified some structure; right?
12 A Identified the function, and I identified the
13 portions of the specification that appeared to relate.
14 THE STENOGRAPHER: One moment, please.
15 Counsel, may we go off the record?
16 MR. YANG: Yeah.
17 THE STENOGRAPHER: Off the record at 10:10 a.m.
18 (Off the record.)
19 THE STENOGRAPHER: Back on the record at
20 10:11 a.m.
21 MR. HALVERSON: Yeah, I'll just ask that again.
22 BY MR. HALVERSON:
23 Q So we were looking at means for coupling in
24 paragraph 76, and you identified a function -- excuse me.
25 Then you identified some passages of structure from the

1 specification; is that right?
2 A The specific wording that I used was "appears to
3 relate." I think, as you know, in the district court, I
4 took a position that there was insufficient disclosure of
5 structure for some of these means-plus-function terms.
6 So what I did is I identified the passages from
7 the specification that related to the function. And so
8 you can see it's a pretty straightforward process that if
9 the '002 patent describes the use of a USB interface,
10 that's something that I found in the prior art. So at the
11 same level of which there is disclosure in the '002 patent
12 related to structure, I identified those kinds of elements
13 within the prior art.
14 Q And there are other passages of the '002 patent
15 that describe the USB connection between the two
16 devices -- is that right? -- beyond 3145 to -50?
17 A I suspect there are.
18 Q How did you pick this one?
19 A I mean, I think it's -- pretty well describes the
20 use of USB interface. That's the kind of thing that can
21 provide an external peripheral device being able to couple
22 physically to the port of the processing device. It's an
23 example identified in the specification, and it was one
24 that was readily apparent in not only the prior art but
25 the state of the art and something a person of skill in

1 the art would have been well familiar with.
2 Q Go to paragraph 131 of your declaration. I think
3 it's on page 87.
4 A Okay.
5 Q Just want to confirm that for independent
6 claim 11.
7 You're not offering any additional analysis
8 beyond what you've offered for independent claim 1; is
9 that right?
10 A I think that is right. The references for each
11 of the elements are to the earlier elements. There does
12 not appear to be any additional exposition for any
13 limitation for claim 11.
14 Q And that's the same for independent claim 21?
15 A That is true.
16 Q And so you referenced this earlier, but you had
17 taken the position in the district court that certain of
18 these claims were indefinite or otherwise invalid under
19 the various forms of 112; is that right?
20 A Yes.
21 Q And are you intending to advance those positions
22 here?
23 A It's my understanding that, as part of an IPR,
24 issues around 112 are not valid bases to raise in an IPR.
25 So I think the answer would be no, based on my

1 understanding of the limitations of what can be raised in
2 the process.
3 MR. HALVERSON: It's okay by me.
4 BY MR. HALVERSON:
5 Q And are you aware that the patent office can
6 still weigh in on 112 issues, if not make a formal
7 finding, as it relates to those?
8 A As to what the patent officer can do, I think
9 that is ultimately a legal question. So I don't think
10 I've taken a position as to what they can or can't do at
11 this point. To the extent the patent owner raises
12 questions around 1126 and its patent owner response, then
13 I would use the reply potentially to respond to those.
14 And my understanding in the institution decision,
15 there -- the pa- -- the PTAB did not take a specific
16 position. Whether they can or can't, going forward, I --
17 I -- I don't understand the full scope of what they could
18 do.
19 Q And I guess, the only reason I ask is so, in
20 response to my question of whether or not you're still
21 going to advance those 112 positions from before, here you
22 said, "I think the answer would be no." And so I'm not
23 sure if you're leaving open the opportunity to do that or
24 if you're saying, in this paper, no, but I reserve my
25 right to do that later if something else changes.

1 A You said "still." So I don't think I've taken
2 any position as to 112 as a basis for invalidity in this
3 declaration. Okay. So ignoring "still," it's my
4 understanding that its use of indefiniteness as it relates
5 to 116, 6, or other claim terms is not a decision that the
6 PTAB usually reaches as part of an IPR or ever or at all.
7 But to the extent I was asked to offer opinions around
8 indefiniteness in a reply declaration, then I potentially
9 would. I've offered those positions in the district court
10 and stand by those opinions also, regardless of what the
11 district court has ultimately said.
12 Q So I think I just want to clarify the very
13 beginning of that. You said you don't think you've taken
14 any position as to 112 in this declaration. I agree with
15 that.
16 A Okay.
17 Q You again qualified with you don't think. Are
18 you aware of any 112 invalidity -- sorry. Let me start
19 over.
20 Are you aware of any 112-type opinions in this
21 declaration?
22 A I'm not aware of any as I sit here right now. I
23 don't have the declaration memorized, but I defer to what
24 it says, if I'm misremembering something.
25 Q Perfect.

1 MR. YANG: Thanks.
2 BY MR. HALVERSON:
3 Q Dr. Almeroth, you've been handed an exhibit
4 marked Exhibit 1027.
5 BY MR. HALVERSON:
6 Q Have you seen this before?
7 A I have.
8 Q What is it?
9 A It is the Kaplan reference used in the first
10 round.
11 Q And were you familiar with the Kaplan reference
12 before you started your work on this proceeding?
13 A It -- it seemed familiar, but I don't have a
14 specific recollection.
15 Q Do you know any of the three inventors, as far as
16 you know?
17 A Not that I have a specific recollection of.
18 Q And real quick, back on the Deforche (phonetic).
19 Same question, do you know any of those four inventors as
20 you sit here today?
21 A I don't believe so.
22 Q Where does Kaplan talk about drivers?
23 A I don't have an electronic version to search, but
24 generally, in the context of Kaplan's disclosures with
25 respect to how it operates and in the context of

1 discussions of things like USB and peripheral devices, a
2 person of skill in the art would understand the use of
3 drivers in that context.
4 Let me see. I can probably go to the first
5 ground where drivers come up. And that would provide the
6 basis for some of what I just said in the declaration
7 itself.
8 Q Looking at, for example, paragraph 98.
9 A That would be for the preamble.
10 Q And you see the word "driver" in the preamble?
11 A I do.
12 Q Or for example, paragraph 103?
13 A Yes. That's actually where I was when --
14 Q I interrupted you and shifted you earlier?
15 A You pointed me to the preamble. But yes. That's
16 where you get into the limitations and where it mentions
17 drivers and the section contains a setup as to what Kaplan
18 describes. And then the role in which the secondary
19 references the state of the art and the knowledge of a
20 person of skill in the art would play a role.
21 Q The beginning of paragraph 103 is some ellipsis
22 there. Do you see those?
23 A I do.
24 Q And so the words that have been ellipsed -- if
25 that's a word -- out are by means of a first preinstalled

1 generic audio driver of the operating system; right?
2 A I believe that's correct.
3 Q Why did you ellipse out those words?
4 A No particular reason.
5 Q Are you suggesting with that recitation of a
6 portion of the claim language that Kaplan does not rely on
7 a first preinstalled generic audio driver of the operating
8 system?
9 A No. I'm not suggesting that. I'm dealing with
10 the portion of the limitation that I've identified and
11 then circle back around to that requirement by the time
12 you get to the transition between 104, so the end of 104
13 and into 105.
14 Q Go to paragraph 107 for me.
15 A Okay.
16 Q You say that Kaplan recognizes that it was
17 desirable -- sorry. We'll give full force to the quote.
18 "As Kaplan and others recognize, it was desirable to avoid
19 the needs to install drivers."
20 Do you see that?
21 A I do.
22 Q What in Kaplan suggested to you that that was a
23 recognition of Kaplan?
24 A So there's at least the cite that's here and then
25 understanding the nature of Kaplan by understanding the

1 full scope of its disclosures with respect to using plug
2 and play as well as trying to make the process easy and
3 seamless. That is the kind of support a person of skill
4 in the art would understand based on reading the
5 reference.
6 Q Let's go to paragraph 21 of Kaplan, will you?
7 A Okay.
8 Q Let me know when you're there.
9 A I'm there.
10 Q Why don't you give it a read.
11 A Okay.
12 Q And what in paragraph 21 suggests that it was
13 desirable to avoid the need to install drivers?
14 A Really, the context of the whole statement. The
15 idea of describing figure 2 and the interaction between
16 the components of the system and the different style of
17 ways in which the system can be used, which are then more
18 fully described in the remainder of Kaplan. So the idea
19 here of being able to do kind of standard plug and play
20 functionality among the different components to provide
21 flexibility for how to connect the components of the
22 system.
23 Q So the first half of paragraph 21 is all about
24 the connection between the receiver and the display; is
25 that right?

1 A That's part of what it described. It's really
2 describing all of what figure 2 is. Not sure I would try
3 and divide up the scope of the content in the paragraph to
4 be that limited.
5 Q So the second sentence says, "As shown receiver
6 110's connected to the display device 210, for example, a
7 television or other video display monitor"; right?
8 A That's what it says.
9 Q It goes on to describe how you can use an HDMI
10 cable for that connection?
11 A That's the next sentence.
12 Q And then the next sentence is still about the
13 receiver and the display device and the communication over
14 that HDMI cable; right?
15 A The next sentence says, "The user may select an
16 input on the display device." So I think that that is not
17 limited to the -- not within the scope of your
18 characterization of what the sentence says.
19 Q So the fact that the user can select an input on
20 a display device 210 suggests to you what?
21 A Just what it says.
22 Q How does the user select an input -- sorry. How
23 does the user select an input on display device 210?
24 A I'd have to look at the rest of Kaplan, if that's
25 what you're asking about. This just says that the

1 selection takes place -- the user may select an input on
2 the display device, potentially lots of ways of doing
3 that. That would be understood to a person of skill in
4 the art. And then there's potentially other portions of
5 Kaplan that are relevant to both that question or other
6 ways in which the Kaplan disclosure might operate.
7 Q So Kaplan describes the use of a remote; right?
8 A I believe Kaplan does.
9 Q Does Kaplan describe any other input device other
10 than remote 130?
11 A Your question seems incomplete in the context of
12 what functionality.
13 Q Any functionality.
14 A I don't have Kaplan memorized to the point where
15 I can recite to you every paragraph or any other paragraph
16 that would be potentially relevant to your question.
17 Q So are you aware of any other input devices in
18 Kaplan other than remote 130?
19 MR. YANG: Objection. Asked and answered. I
20 mean --
21 THE WITNESS: I think --
22 MR. YANG: -- if you want the witness to review
23 the whole reference, Counsel, he can. He just does not
24 have it memorized and you're asking him to identify
25 specific passages.

1 THE WITNESS: I don't have Kaplan memorized to
2 the point where I can cite to you a paragraph that would
3 identify other means of input.
4 THE STENOGRAPHER: And, Mr. Yang, if you can just
5 speak up a little bit, that would be great.
6 MR. YANG: Yes. Got it.
7 BY MR. HALVERSON:
8 Q When is the last time you read Kaplan?
9 A I don't recall.
10 Q Have you read it in the last month?
11 A I -- not cover to cover.
12 Q As you sit here today, do you recall whether or
13 not Kaplan -- sorry. As you sit here today, do you have
14 an opinion about whether or not the remote of Kaplan is an
15 important part of the system described in Kaplan?
16 A I'm not sure how to evaluate whether or not it's
17 important or not. Important in what regard? It's an
18 aspect of the system. My recollection is that the remote
19 was not something I relied on as a basis for meeting any
20 particular limitation. In fact, I thought there were
21 other portions of Kaplan that describe not having to
22 perform some sort of selection via a remote, at least in
23 the context of the '002 patent and what's required. So
24 whether or not Kaplan has a remote and can be used in a
25 certain way and some embodiments doesn't change the

1 opinions that are expressed in my declaration.
2 Q So in your response to your question of
3 importance in what regard, important in the operation
4 described in Kaplan. Does that change anything in your
5 answer?
6 A Well, there's multiple different embodiments.
7 And with respect to being a necessary component of some
8 embodiment to accomplish a particular function in Kaplan,
9 that might be the case. But not necessarily the case that
10 the remote control is important in every embodiment or is
11 it the case that the use of the remote control is
12 necessary to accomplish any limitation of the claims at
13 issue in this IPR ground.
14 And in fact, that's covered in the second portion
15 of paragraph 21. It talks about a more streamlined
16 process where there aren't set up actions that are
17 required. So in those instances, there are portions of
18 Kaplan that I believe describe not needing a remote
19 control to accomplish similar functionality as disclosed
20 in Kaplan.
21 Q So you're referring to where in Kaplan, the
22 sentence beginning "as an example"?
23 A No. About ten lines down, "However, embodiments
24 of the present invention provide a walled garden
25 approach." And then it continues on from there.

1 Q And what is that next sentence?
2 A "However, embodiments of the present invention
3 provide a walled garden approach in which no configuration
4 actions on the part of the user are needed." And it goes
5 on from there.
6 Q Sorry. My question was: What is the next
7 sentence?
8 A Oh, after that one?
9 Q Yeah.
10 A "Because the receiver 110, the transmitter 120
11 and/or the remote control 130 are prepared prior to
12 shipment from the manufacturer and/or delivery to the
13 user, the user does not need to configure those devices
14 and the user experience is more streamlined. The user
15 just plugs in the devices and the operate as intended."
16 Q And so those devices are the receiver 110, the
17 transmitter 120 and the remote 130?
18 A It says "and/or."
19 Q Would the system of Kaplan function without
20 receiver 110?
21 A Depends on what you mean by "function." Like
22 what functions? Does it have any functionality?
23 Q I guess what is Kaplan generally trying to
24 accomplish?
25 A Let's see what it says. There's all sorts of

1 paragraphs at the beginning in terms of what the state of
2 the art was, what existed, what the capabilities of
3 current systems are.
4 Q There are -- the abstract, I think, gives a
5 pretty decent overview of what Kaplan's trying to do.
6 Do you disagree with that?
7 MR. YANG: Objection to form.
8 THE WITNESS: I -- it's one aspect of what Kaplan
9 is. I don't know that it's a complete recitat- --
10 recitation of everything in Kaplan. Hence the reason a
11 person of skill in the art would read the entirety of the
12 reference.
13 BY MR. HALVERSON:
14 Q Is there an embodiment of Kaplan that does not
15 attempt to accomplish a display of video content on a
16 display -- excuse me -- on a display device?
17 A I don't have Kaplan memorized. I don't recall
18 there being an embodiment like that in Kaplan.
19 Q Is there any description in Kaplan of how one
20 would be able to display video content on a display
21 without receiver 110?
22 A I don't have an answer to that question. I don't
23 have Kaplan memorized to the point where I could answer
24 that question.
25 Q How about with regard to -- sorry. I asked that

1 same -- yeah. Receiver 110. Sorry.
2 How about with regard to transmitter 120?
3 A It'd be the same answer.
4 Q How about with regard to the remote control 130?
5 A It would be the same answer.
6 Q Now, you also cited paragraph 40 as part of your
7 support for your statements in paragraph 107 of your
8 declaration, that Kaplan recognized it was desirable to
9 avoid the need to install drivers; right?
10 A Yes.
11 Q What in paragraph 40 suggests to a person of
12 ordinary skill in the art that Kaplan recognized it was
13 desirable to avoid the need to install drivers?
14 A It's pretty much what the paragraph says.
15 Q Do all plug and play devices work without
16 installing drivers?
17 A I think a person of skill in the art at the time
18 would have understood that that would have been one of the
19 most common uses of plug and play. I think a person of
20 skill in the art would have also understood that there are
21 other ways in which plug and play could be implemented.
22 But it would certainly be the most common understanding of
23 how plug and play would work.
24 Q Go to paragraph 29 for me.
25 A Of?

1 Q Of -- sorry. That's a -- another fair question.
2 Paragraph 29 of Kaplan, please.
3 A Okay. 29. I'm there.
4 Q Give it a read. Let me know when you're done.
5 A Okay.
6 Q So Kaplan relies on this custom software solution
7 in order to accomplish its display and video content;
8 right?
9 A I think that is an overly broad characterization
10 to the point that it is incorrect.
11 Q You agree that the middle of paragraph 29, Kaplan
12 says, "Additionally, since embodiments of the present
13 invention provide custom software solutions, the methods
14 and systems described herein make available proprietary
15 features, such as user-defined channels, that are not
16 available using conventional techniques"; right?
17 A That is a correct reading of that sentence of the
18 paragraph, which comes in the context of describing an
19 embodiment dealing with metadata and a use of Kaplan.
20 That is not something I rely on as the basis for my
21 opinions in the declaration.
22 Q If you go to paragraph 47 of Kaplan for me, here,
23 it describes a resident software application.
24 Do you see that?
25 A I do see that.

1 Q Where is that resident software application
2 stored?
3 A At least in this sentence, it says, "In one
4 embodiment, a resident software application is stored in
5 the non-volatile memory 420 of the transmitter 120."
6 Q Go to paragraph 48.
7 It says that resident software application is
8 then installed on computer 220 when the software
9 components are not available on computer 220; right?
10 A I see the sentence you're paraphrasing. It does
11 start with "in some embodiments."
12 Q Does it describe any embodiments where the
13 software -- sorry. Let me start over.
14 Does Kaplan describe any embodiments where the
15 resident software application is not installed on
16 computer 220?
17 A I don't have Kaplan memorized to the point that I
18 can answer that question. Moreover, I think a person of
19 skill in the art's understanding of 48 is that it's
20 describing an option. So it would provide for different
21 embodiments as to the understanding of a person of skill
22 in the art as to how the operation of the system could
23 operate with respect to accessing, storing, loading, or
24 saving software components on the computer.
25 Q It's an interesting broader picture question.

1 So if a reference describes an embodiment where
2 software is installed and it doesn't describe any
3 embodiments where software is not installed, is it your
4 understanding that that installation is an optional aspect
5 of a reference because it's the part of an embodiment?
6 A In a generic sense, it depends. In this
7 particular instance, given the particular function that's
8 being described, I think a person of skill in the art
9 reading this passage would understand the pretty common
10 design choices of how you could operate a system where you
11 have software that would be located on a transmitter and
12 then ultimately where that software can be installed,
13 where it can be stored. There -- there's no rocket
14 science. It's -- it's well understood, routine,
15 conventional in terms of being able to load, store,
16 install, and execute software on a computer system.
17 Q So if you're not installing it on a computer 220,
18 where are you installing it?
19 A You may not have to install it at all. It may
20 just stay resident on the transmitter and execute from
21 there.
22 Q And do you -- are you aware of any instance in
23 Kaplan that it describes that?
24 A I -- I don't have Kaplan memorized. I don't know
25 if it gives that as an option, but it would certainly be

1 an obvious design choice just based on the simple way in
2 which computers have operated for at least a decade before
3 the '002 patent.
4 Q Would there be any need to determine whether or
5 not software was installed on the computer if it wasn't
6 going to be subsequently installed on the computer?
7 A Sure.
8 Q Why?
9 A To see whether or not it was already there, to
10 give the system the option of executing it on the
11 computer, as opposed to execute -- executing it on the
12 transmitter.
13 Q And I suspect I know the answer, but are you
14 aware of any instance in Kaplan of software being executed
15 on the transmitter?
16 A It's going to the same answer. I don't have
17 Kaplan memorized. There may be some disclosure, but it
18 would certainly be an obvious design choice to a person of
19 skill in the art in the context of reading Kaplan.
20 Q We were talking about preparing a little bit ago,
21 in the context of Kaplan, how the transmitters -- sorry --
22 how the transmitter, receiver, and remote were prepared.
23 Do you remember that?
24 A I do remember that paragraph.
25 Q What does it mean to be prepared?

1 A I think a person of skill in the art would
2 understand that covers a range of implementations.
3 Prepared could mean that a -- pretty much the whole
4 spectrum in the sense that they were already designed to
5 work in terms of being connected together based on their
6 addresses or the idea that you could turn them on and they
7 would find each other through something like UPnP as an
8 example. I think the -- the concept of prepared, at least
9 as it's applied in Kaplan, covers -- would cover a -- a
10 broad range of implementations.
11 Q Is it your opinion that finding a device using
12 UPnP is preparing?
13 A In the context of Kaplan, it either is something
14 a person of skill in the art would understand based on the
15 disclosures in Kaplan or would understand that it's an
16 alternative approach, given the alternatives that are
17 expressed in Kaplan throughout paragraph 21 and the
18 remainder of the specification.
19 Q What disclosures in Kaplan suggests to a person
20 of ordinary skill in the art that UPnP would be within
21 preparing in the context of Kaplan?
22 A I think there's kind of paragraph 21 that we
23 talked about. I had also referenced paragraph 40 that you
24 had pointed to. Those are the two that immediately come
25 to mind. There's kind of the standard language in 65

1 about how these embodiments are illustrative, and so it's
2 in that context that you apply the knowledge of a person
3 of skill in the art in terms of both the explicit
4 disclosures and then also understanding about
5 implementation and design choices that such a person would
6 have been familiar with.
7 Q Is there any specific part about paragraphs 21 or
8 40 that suggest that to a person of ordinary skill in the
9 art?
10 A I'm not sure how much specificity you're asking
11 for in your question, but --
12 Q As much --
13 A -- certainly --
14 Q Sorry.
15 A -- I think the disclosures there provide a good
16 deal of specificity. And to the extent one were to
17 suggest it's not specific enough, then I think it falls
18 within the purview of the knowledge of a person of skill
19 in the art.
20 And, of course, there might be other paragraphs
21 kind of on that specific point, but those are the two that
22 I would start with.
23 MR. YANG: Counsel, can we go off the record for
24 a few minutes?
25 MR. HALVERSON: Sure.

1 THE STENOGRAPHER: Off the record at 10:49 a.m.
2 (Off the record.)
3 THE STENOGRAPHER: Back on the record at
4 10:58 a.m.
5 BY MR. HALVERSON:
6 Q So just before we went on break, you had said you
7 weren't sure how much specificity I was asking for with
8 regards to specific portions of paragraphs 21 and 40 that
9 suggest to a person of ordinary skill in the art that UPnP
10 would be within the preparing aspect of Kaplan.
11 And I guess, my question, then, is: How much
12 specificity can you provide as it relates to those two
13 paragraphs? If there are lines or phrases that suggests
14 that, that's what I'm curious as to.
15 A Sure. So there's -- there's kind of multiple
16 levels here. The first is what the actual disclosure is.
17 And on that level, the first thing to understand is
18 Kaplan's disclosures do not limit it to a -- a
19 preconfigured environment -- a prepared prior to shipment
20 only. There are other examples that are identified
21 throughout the specification. So if one -- kind of at
22 that level, it says, "As an example, the receiver is
23 coupled to a television using an HDMI cable, the
24 transmitter is inserted into the USB port of a computer
25 containing video files, and with no wireless setup

1 actions, the user is able to watch the videos on the
2 television." And when it says "no wireless setup
3 actions," it's generally referring to what's visible to
4 the user. And it says, "This contrasts sharply with
5 conventional wireless networking systems setup
6 procedures."
7 So there's at least three different ways in doing
8 setup described in paragraph 21. Those are further
9 articulated on in paragraph 40.
10 Now, there's those descriptions, and then there's
11 also the next level is the understanding a person of skill
12 in the art would have with respect to the ways in which
13 each of those different examples could be implemented. So
14 now you have kind of a two dimension graph in terms of
15 what specifically disclosed is the range of options and
16 then, within those ranges of options, ways in which they
17 could be specifically implemented, as understood by a
18 person of skill in the art.
19 And really, ultimately, this ties into the other
20 portions of the declaration in the state of the art in the
21 sense that both in terms of user-specific setup procedures
22 that were known, the use of things like plug and play for
23 USB devices, universal plug and play for at least wireless
24 devices, and all of the different ways that existed in the
25 15 years before 2010 on ways in which different components

1 of a system could be integrated into that system, either
2 at start-up initialization or just in repeated use, are
3 things that a person of skill in the art would have known.
4 And so that's kind of the -- the second or into
5 the third level of what becomes obvious beyond just the
6 disclosures of Kaplan.
7 Q I think just one final question on Kaplan.
8 So just so that I have a clear understanding of
9 what it is your opinions are about Kaplan, is it your
10 opinion that Kaplan describes the use of drivers or
11 renders obvious the use of drivers or doesn't use drivers
12 but would be modified in view of other references that do
13 use drivers?
14 MR. YANG: Objection to form.
15 THE WITNESS: So I think the basis that I use
16 Kaplan is pretty well set forth in the declaration, and I
17 can give you a quick summary. I don't think it fits into
18 any of the categories you've identified. The best place
19 to look at was -- that page 68, where we -- it talks about
20 limitation 1B and includes that first preinstalled generic
21 audio driver. So what it does is it recognizes that
22 Kaplan uses USB. It talks about Windows. So it actually
23 teaches systems and devices and components that all use
24 drivers. So it teaches a person of skill in the art the
25 particular use of drivers in those -- in the context of

1 its operation. And that links it to a person of skill in
2 the art to the extent they wanted further understanding of
3 how that process would work beyond their knowledge of USB
4 and the standard and how setup works.
5 Then there's additional references that describe
6 that process. And one of those is Ahmed. So that's where
7 paragraph 105 starts to talk about.
8 So it's -- it's in Kaplan, the use of drivers.
9 It teaches drivers. Person of skill in the art would
10 understand drivers are used, but the secondary references
11 provide additional detail as to specific ways in which
12 that functionality can be implemented.
13 BY MR. HALVERSON:
14 Q So I guess that's my question.
15 Where does it teach drivers?
16 A It teaches drivers starting in 103, in the
17 context of its operation.
18 Q In your -- sorry. Your 103 of what? Of Kaplan?
19 A Of -- no. Of my declaration, walking through
20 what's in Kaplan, and then linking what's in Kaplan to the
21 understanding a person of skill in the art would have had
22 about what Kaplan teaches and then linking that to the --
23 some of the secondary references, state of the art and
24 knowledge of a person of skill in the art.
25 Q So what aspect of Kaplan, not of your declaration

1 but of Kaplan, teaches drivers?
2 A Gosh. So I'll start and I'll give you a few
3 examples. I don't think I can give you a full recitation
4 since it's in multiple places in the declaration. But all
5 of the references to the use of USB are all teachings of
6 the use of drivers. Because USB uses drivers, it uses the
7 preinstalled generic drivers in the way that a person of
8 skill in the art would understand. And so the mentions of
9 USB, that's covered in my declaration 103 and then cites
10 to various paragraphs and figures in Kaplan.
11 Q So right -- right there, where is that? 'Cause I
12 see the USB in paragraph 103, but I don't see a reference
13 to Kaplan there.
14 A So Kaplan is 1027. So paragraph 58, 50 -- or
15 figure 6, 8, 17, 22, 47 through 52, those are the 1027
16 references, the Kaplan reference in my paragraph 103.
17 Q Perfect.
18 A So those are some of the examples. And then
19 paragraph 104 talks about connecting the US [sic] port of
20 the computer, the transmitter 120, and then seeing it as a
21 mass storage device through USB. All of that's going to
22 in -- use drivers. So that's 46 through 52, 58 through
23 60. It also ties back to paragraphs 21 and 40 from
24 Kaplan, and then also 50 and 51, which is actually
25 included above. So those are at least the cites in Kaplan

1 mentioned in paragraph 103 and 104.
2 MR. HALVERSON: Give you that.
3 MR. YANG: Thank you.
4 MR. HALVERSON: Give you that.
5 BY MR. HALVERSON:
6 Q Do you speak Japanese, Dr. Almeroth?
7 A No.
8 Q Do you read Japanese?
9 A No.
10 Q Oh, you know what? Shoot.
11 MR. HALVERSON: Sorry. Bear with me one second.
12 My Adobe just died.
13 THE STENOGRAPHER: I don't need this what? I'm
14 sorry.
15 MR. HALVERSON: Bear with me one second. My
16 Adobe just died.
17 Sorry about this.
18 BY MR. HALVERSON:
19 Q So, Dr. Almeroth, you've been handed an exhibit
20 that's been marked as Exhibit 1031, a Japanese patent
21 publication with an inventor name Takashi Maeda and Jun Ji
22 Matsumoto.
23 Are you familiar with this reference?
24 A Yes.
25 Q How would you like to refer to this today?

1 A Maeda.
2 Q Maeda?
3 A Yes.
4 Q Sounds good.
5 A The last name of the first inventor.
6 Q Go to paragraph 19 of Maeda for me.
7 (Stenographer sneezed.)
8 MR. HALVERSON: God bless you.
9 THE WITNESS: I'm there.
10 BY MR. HALVERSON:
11 Q Describe the output IF106, a user IF107, a
12 network IF108. You see those?
13 A I do.
14 Q What's "IF"?
15 A It looks like it is an interface.
16 Q And what are you looking at to arrive at that
17 conclusion?
18 A Preliminary just what it says in that paragraph.
19 But it's referencing figure 2. Output high F106. It's
20 the link between what's in box 100 and what is external to
21 box 100, which is typically an interface. The other one
22 was a user interface 107 -- right? -- so that would be the
23 thing that links to the external keyboard, what's outside
24 of the PC housing itself. That would typically be an
25 interface of some sort.

1 Q So is that part of computer 100?
2 A The interface would be part of the computer.
3 Q If you look back at paragraph 25 or 26 or 27 or
4 28, there are in each paragraph some sort of unit, be it
5 screen generation, image capture, audio generation, audio
6 capture. Do you see those?
7 A I do.
8 Q And then each of those paragraphs describe those
9 units as a processing unit. Do you see that?
10 A I do.
11 Q What's a processing unit in the context of Maeda?
12 A I don't recall that Maeda gives a definition of a
13 processing unit, but a person of skill in the art would
14 understand based on the context that it's a thing that
15 performs processing. And the specific processing that it
16 performs is as described subsequent to that term in the
17 corresponding paragraphs.
18 Q So is that hardware, software, or a combination
19 of both?
20 A In the context of Maeda, I don't see why it
21 couldn't be hardware and/or software.
22 Q You included an "or" there. How would it be
23 hardware only?
24 A That the functionality is programmed into the
25 hardware.

1 Q Like an ASIC?
2 A Yes.
3 Q Would you consider the programming of that ASIC
4 to be software?
5 A Sitting here now, I don't have some rubric to
6 apply to an ASIC. It's to define it as software versus
7 not. Usually depends on context whether or not an ASIC is
8 considered programmed hardware or whether or not it's in
9 the hardware itself. Sometimes the distinction matters
10 here. I don't recall the distinction having an impact on
11 any of the opinions in this declaration.
12 Q So if you look at figure -- how did you tell what
13 was figure 2, sir? Oh, there?
14 A It says in the upper left.
15 Q If you look at figure 3 for a second for me.
16 A Yes.
17 Q You see a collection of, quote, unquote, "units"
18 here. Which when we juxtapose that with the PC and
19 projector figure 2. Do you interpret these as functional
20 units?
21 A I interpret them to be what they say. I don't --
22 have made and memorized to the extent it puts any
23 constraint on how those boxes could be implemented with
24 respect to hardware and/or software.
25 Q Go to paragraph 78 for me.

1 A Which one?
2 Q Another great question. Paragraph 78 of Maeda,
3 please.
4 A All right. I'm there.
5 Q What is Maeda -- sorry. How does a person of
6 ordinary skill in the art understand the phrase "can be
7 applied" there in that first sentence?
8 A That one of the applications of a -- of what made
9 it disclose is something that can be applied to the
10 application of a system that transmits images and audio
11 from an image generation device such as a PC to an image
12 projector device such as a projector.
13 Q So putting that together using the words of Maeda
14 here, you're saying that the image and audio transmission
15 system of Maeda can be applied to a system that transmits
16 images and audio?
17 A What I would say is one of the applications of
18 the architecture disclosed in Maeda is one that transmits
19 images and audio from an image generation device in the
20 remainder of what it says. So it's one of the things that
21 a system like Maeda could do would be images and audio.
22 It could do video. And so it's really just saying one
23 example in which Maeda could be applied is what's
24 described in paragraph 78.
25 Q So you do not interpret Maeda as being a software

1 solution and this can be applied to as being the
2 installation of that software onto a system that transmits
3 images and audio?
4 A I wouldn't agree with that characterization.
5 There's both hardware and software in Maeda and there's
6 aspects of it that are software and there's aspects of it
7 that are hardware. And Maeda discloses that, you know,
8 you have things like PCs and projectors and, within that
9 context, you can have software to perform a particular
10 functionality.
11 Q Which aspects of Maeda are software?
12 A I'd have to go back and review Maeda to see. My
13 recollection just generally sitting here now is -- it's
14 the functionality that it describes. I don't recall
15 Maeda -- again, I don't have it memorized to the point of
16 saying where it puts prohibitions on functionality in
17 terms of this is hardware only or this is software only.
18 Q So absent of prohibition, in the text of Maeda,
19 it's your understanding that it could be either hardware
20 or software?
21 A That's a little bit generic. In some instances,
22 I mean, it mentions the use of a PC. Okay. So I suppose
23 you could implement a version of Maeda using a virtual PC,
24 but in any instance there would still be some underlying
25 hardware in which that virtual image would have to

1 operate. I think a person of skill in the art reading
2 this would understand that you have the typical
3 flexibility of how the functionality could be implemented
4 across the spectrum. Mostly hardware, all hardware,
5 mostly software. And a person of skill in the art would
6 understand that flexibility is being disclosed within
7 Maeda. Where there would be constraints on that would be
8 anything in Maeda that says, you know, this could only be
9 implemented in our system as hardware or software or
10 whatever it would say. And then you'd go to the second
11 level of whether or not a person of skill in the art would
12 understand that they could implement what's described in
13 Maeda differently than how Maeda describes it.
14 Q Does Maeda describe drivers?
15 A It's going to be a similar style of answer to
16 Kaplan in the sense of when we get to that ground in the
17 declaration and for that limitation I think there is some
18 lead-up to a system that uses drivers and then it connects
19 to Ahmed and Deforche. So let me find that for you.
20 Yeah. I think paragraph 162 points to some
21 places in Maeda. Paragraph 15 is an example, figure 1,
22 and then it uses that functionality to establish the
23 understanding a person of skill in the art would have had
24 about the use of drivers. And that's in 163. And then it
25 goes on from there and combines in with some of the

1 secondary references in a very similar way as to the way
2 Kaplan operated.
3 Q What about paragraph 15 suggests the use of
4 drivers in Maeda -- sorry. Let me ask that in a con --
5 put some context of it.
6 What about paragraph 15 of Maeda suggests the use
7 of drivers?
8 A 15 tells me the present embodiment. An example
9 is described in which a PC is used as an image generation
10 device that generates image and audio and images and audio
11 are transmitted to a projector. I'll stop there. Well,
12 it says using a wireless LAN. So it's a PC. You're
13 transmitting audio and video -- or audio and images.
14 You're using a wireless LAN.
15 Pretty much in the context of the first 30 to 45
16 minutes of this deposition, I think I established in my
17 answers the fact that the use of drivers in a system like
18 that was commonplace, well understood, especially when
19 you're using operating systems like Windows. And so
20 that's one example of a paragraph.
21 Pretty much the references to a PC after that and
22 the functionality of a PC communicating with components
23 that are external to the PC via the various interfaces are
24 all the kinds of things that would use drivers. So I
25 think that concept is taught pretty expansively throughout

1 Maeda. And to be clear, the concept is using PCs to
2 connect to components outside of the device and the
3 interfaces. And they use the drivers to do that.
4 Q And so earlier, when we were talking about
5 drivers versus software, I think you had said that could
6 be either one, just depended on the context. Do you
7 remember that?
8 A I wouldn't consider drivers or software to be
9 exclusive options, so I'm -- I remember a discussion
10 earlier about drivers and software. Not sure you've
11 characterized what I said accurately, though.
12 Q Well, then perhaps we should revisit to make sure
13 we're on the same page. What I recalled was there was a
14 discussion about software applications being kind of a
15 broad umbrella of software. And then a specific subset of
16 that being drivers that were used to translate
17 communications to a device-specific form; is that right?
18 A No.
19 Q What did I get wrong there?
20 A So first, the discussion, or at least the
21 questions and answers, specifically the answers, were in a
22 general understanding. As I testified to, I don't think
23 there are hard and fast definitions for these things that
24 would allow you to create some sort of strict hierarchy.
25 The second is, in your characterization, I think

1 you flipped software applications and software. I think I
2 testified that you can have software that was not a
3 software application. So that would mean software
4 applications would at least be a type of software.
5 The next is the relationship between drivers and
6 software across hardware interfaces like a USB or any kind
7 of connection where you would plug in via a wire or a
8 wireless connection, there's some sort of hardware
9 associated with the interface and then, typically, there's
10 a driver included to facilitate communication across that
11 interface.
12 To be clear, I think, generally, it's pretty well
13 understood that the common way in which computers operate
14 is that they have interfaces and that they use drivers. I
15 think I did caveat some of my answers earlier by saying
16 that doesn't mean you couldn't design specialized hardware
17 or integrate devices or do something to build a system
18 that might fall outside of the general kind of ways in
19 which a system might operate.
20 But, ultimately, I think the way a computer
21 operates and has operated for a decade or more before the
22 '002 patent came out or was filed for is that you would
23 have components or devices or hardware external to a PC
24 that you could then connect to the PC and, often, it would
25 use drivers and there were various ways in which that

1 hardware could be made to integrate with a PC. Either
2 hard coded, specialized drivers, configuring by a human
3 user or auto-configuring and kind of the ways in which
4 that process happens are all pretty well known in the art
5 as they became fairly commonplace for users setting up
6 their PCs over the years. That's in a general PC sense.
7 And then there's, kind of within that, the field
8 of configuring PCs or other kind of devices to basically
9 link with a projector wirelessly or wired to be able to
10 communicate what's on a screen or in a file to be able --
11 to be what's displayed on any kind of display device.
12 Q What's a LAN card?
13 A Typically, a LAN card, local area network card,
14 is kind of broad. It can take any of a number of
15 different forms. I could think of a LAN card as something
16 that would be seated into, say, a PCI slot in a PC. It
17 could also be in a PCMCIA slot. You could have a LAN card
18 that's part of a USB stick. I suppose there's lots of
19 different ways that the hardware itself could -- could
20 manifest itself to be considered a card.
21 Q Go to paragraph 43 of your declaration.
22 A Okay.
23 Q Why did wireless technology shift away from
24 wireless LAN cards?
25 A The LAN cards that sort of existed prior to USB

1 were things like PCMCIA cards. They were a little bit
2 narrower version of a playing card. And so it required a
3 fairly specialized hardware slot to seat a PCMCIA card
4 into a laptop. The form factor was fairly large and was
5 also pretty specialized. Switching to USB narrowed the
6 footprint of the physical interface, and given that USB
7 was more widely applicable, it was easier to include
8 multiple USB interfaces on a PC, both from a physical size
9 perspective and then in terms of its flexibility and
10 functionality.
11 And so that kind of evolution in -- in PCs'
12 hardware footprints meant that, kind of, the PCMCI-style
13 wireless LAN card fell out of favor.
14 Q And what kind of functionality does a wireless
15 LAN card provide?
16 A Typically, it will provide the ability to send
17 and receive data on a wireless network. So you can think
18 of -- one was there was a Lucent card that would do
19 80211B, and then there were versions that would do A.
20 They would implement different versions of the 80211
21 standard to be able to send and receive data wirelessly
22 and then, on the internal side, being able to send that
23 across the interface as the binary data that was the
24 original data for the transmission.
25 Cards had different functionality. Typically,

1 they would just do the physical layer and the data-link
2 layer. And so delivering an IP packet over the interface,
3 the different cards had different functionality over the
4 course of time.
5 Q And so were those used to supplement an internal
6 access point?
7 A Not sure I would use the term "access point."
8 Not sure what supplement would mean, but typically --
9 Q Let me -- let me ask a better question, then.
10 A Okay.
11 Q Did the machines that were set up to receive a
12 wireless LAN card have their own internal wireless
13 transceivers that they would use to connect to wireless
14 networks?
15 A They could, or they -- they might not. It just
16 depends on how the device was configured. There was sort
17 of further evolution in the sense of you could have a -- I
18 think you referred to it earlier -- an 80211 chip that was
19 just part of the PC. You could have something like that.
20 It was kind of an option, depending on the timeframe and
21 how common -- sorry. Let me start over.
22 Depending on the timeframe, whether or not it was
23 an option, it was common, or whether or not it just became
24 part of a standard PC, it's -- I think it's a pretty
25 standard part of a PC now, if you go order a new one, to

1 have an embedded chip. You still have USB ports. So you
2 could connect a USB wireless device, component, or hard,
3 however -- what term you want to use. So you could
4 actually have multiple wireless interfaces on the same
5 device.
6 Q Why would you need more than one?
7 A To connect to two wireless networks at the same
8 time. Today's a good example, given the unreliability
9 of -- of one wireless network, that you could seamlessly
10 switch between two wireless networks if you had two Wi-Fi
11 connections. There's also lots of applications beyond
12 sort of consumer level.
13 Q Did I give you all that?
14 A No.
15 MR. YANG: Thank you.
16 MR. HALVERSON: You've been handed an exhibit
17 marked Exhibit 1014.
18 BY MR. HALVERSON:
19 Q Do you recognize 1014?
20 A I do.
21 Q What is it?
22 A It's Ahmed, one of the secondary references for
23 the both grounds of the '002 IPR petition.
24 Q And so my understanding of how you used both
25 Ahmed and Deforche (phonetic) in the two grounds is

1 substantially the same way in ground 1 and ground 2.
2 Is that a fair characterization?
3 A I think they are quite similar.
4 Q And you say "they" in that sentence.
5 Are you referring to the way that you use them or
6 the two references as compared to each other?
7 A The -- the way that I used them.
8 Q Okay. Thanks.
9 A That is my own pet peeve, using pronouns in vague
10 ways. So yes.
11 Q Are there forms of USB drivers that are not
12 preinstalled with the operating system?
13 A Your question asks about the operating system.
14 It doesn't identify a timeframe. It depends on the
15 operating system. But, generally, before about 2010, all
16 of the standard modes -- USB modes had generic
17 preinstalled drivers as part of most major operating
18 systems.
19 Q And so when you said "generally, before 2010," do
20 you mean as of 2010 that was the case or after 2010 that
21 was no longer the case?
22 A By at least 2010, if not years before 2010.
23 Q Okay. But so all of the standard modes -- USB
24 modes or generic preinstalled.
25 Are there USB drivers that are not part of the

1 standard USB modes?
2 A I don't recall the standard with absolute
3 specificity. My recollection is there was an option for
4 additional modes, and whether or not they were described
5 as custom or -- I -- I -- I don't recall.
6 But at least for the kinds of modes that were
7 described in both the '002 as well as what was relied on
8 in the prior art grounds, all of those would have been
9 preinstalled generic drivers, or at least that's the --
10 the most obvious way to implement a system like that.
11 Q So is it your understanding, then, that the
12 drivers of the Ahmed reference were preinstalled generic
13 drivers?
14 A My recollection is the ones that I've relied on
15 would have been understood to be preinstalled generic
16 drivers. To the extent they weren't, it would have been a
17 design choice to include those as either part of an
18 operating system or to have them as part of a PC that
19 was -- was being sold.
20 Q And who would have made that choice?
21 A It could have been the manufacturer, the seller
22 of the PC. It could have been the operating system
23 developer. The manufacturer or at least the reseller of
24 the PC would have made a choice about which operating
25 system to install. Those would have come with a suite or

1 a set of preinstalled generic drivers. In particular, for
2 USB-supported hardware, you could also have a -- beyond
3 the manufacturer, a reseller that would put different
4 computer components together, install both an operating
5 system and maybe some optional software drivers.
6 Preinstalled generic drivers could come that way. You
7 could have a whole host of software, including specific
8 drivers or applications. It really goes to the
9 flexibility in which PCs were -- were assembled for sale
10 or for resale.
11 Q So putting some examples on that, we talk -- or
12 you talked about a manufacturer, a seller, an OS
13 developer, potentially a reseller. So, for example, a
14 Dell laptop running Windows, purchased through, for
15 example -- are you familiar with CDW? --
16 A Yes.
17 Q -- purchased through CDW.
18 In that line, does Dell get to decide what
19 drivers are on that machine?
20 A Dell would decide at least some of which drivers
21 would go on the machine. It could -- it could and did and
22 does sell its hardware with no operating system, with
23 Windows, with Linux, or it can actually create custom
24 solutions that are sold with certain configurations.
25 Depends on who their -- their customers are.

1 Q Are there any preinstalled nongeneric drivers?
2 A It depends. I can envision instances where that
3 is the case.
4 Q Well --
5 A Typically, it happens when you have a reseller
6 who will package components together. Gosh, in some
7 cases, it can be preconfigured sets of equipment. In
8 other cases, you could do a build-your-own as a user. In
9 both instances, you can buy a preconfigured system that
10 includes -- you know, an example that comes to mind is,
11 like, a drawing tablet. And so you buy the computer. You
12 get the drawing tablet. You get the keyboard. You get
13 the video camera. You get all of this external stuff.
14 And de -- you can either just get the CD-ROM shipped, or
15 you could have that software already installed on the
16 computer for you by the reseller.
17 As another example of sort of a build-your-own,
18 you could identify that you wanted a particular hard
19 drive, or you select from a menu of hard drive options.
20 And as you get to the more upscale or more expensive,
21 larger size, it changes manufacturers. As part of sending
22 you the computer, the specific driver for that particular
23 manufacturer and that version of the hard drive is
24 preinstalled and operational on the computer when you turn
25 it on.

1 So that -- I mean, basically, the whole range of
2 design choices in terms of how drivers, both generic and
3 specific, that are part of the operating system or not can
4 come on a hardware platform. And a person of skill in the
5 art would have understood all of those choices.
6 Q So when we're talking about Deforche (phonetic)
7 earlier, I think you had said that the most common reading
8 of Deforche (phonetic) was going to be it was the modem
9 device within the laptop; was that right?
10 MR. YANG: Objection to form.
11 THE WITNESS: I don't recall that.
12 BY MR. HALVERSON:
13 Q I guess I can ask.
14 Do you interpret, or would a person of ordinary
15 skill in the art interpret Deforche (phonetic) as teaching
16 a modem device for the laptop or for the device that
17 creates the wireless local area network?
18 A I'm not sure there's a most common. The one that
19 I specifically recall is kind of the description of a
20 personal computer. And so I think that was the use of
21 Deforche that I identified. Whether it has -- is equally
22 applicable to other deployment scenarios, I -- I don't
23 recall what it specifically said.
24 Q And so Deforche (phonetic) uses two different
25 generic drivers as part of its composite presentation; is

1 that right?
2 A I am not sure what that question is asking. I
3 think you're getting into an aspect of Deforche that I did
4 not rely on. I relied on it in a pretty narrow way, in
5 the sense of it was a reference that demonstrated -- that
6 demonstrated that drivers could be preinstalled generic
7 drivers, as really just one reference, among many,
8 demonstrating that you could have drivers that were
9 generic and preinstalled.
10 So with respect to beyond that, additional
11 disclosures in Deforche, it's -- I don't recall that that
12 was something that I relied on.
13 Q So in the narrow way that you were looking at
14 Deforche (phonetic), how did you decide which aspects of
15 Deforche (phonetic) were relevant for your analysis?
16 A Sure. And I -- I know I said the word "narrow."
17 What I -- what I probably should have said and was -- it
18 was limited to the extent of what the declaration says,
19 which I can find the paragraph for you. About
20 paragraph 95.
21 Q Okay. Thank you.
22 A And in the portions that require the generic
23 preinstalled driver, which the first place we got to was
24 page 68 for limitation 1B, it provides more specific
25 context as to the role of Deforche in terms of being a

1 preinstalled generic driver. So that really gets
2 mentioned specifically starting at about paragraph 110.
3 And so Deforche demonstrates, among other
4 references and among the knowledge a person of skill in
5 the art would have had, that there existed preinstalled
6 generic drivers and they could be used for modem-to-host
7 communication or for communicating between a wireless
8 modem device and a computer device through which it's
9 connecting.
10 And then this was the point earlier that it -- it
11 talked about how a user could install a proprietary
12 device. But Deforche used preinstalled generic drivers to
13 accomplish that same function. And that's, in part, what
14 Deforche was -- was teaching and the part that I was
15 relying on.
16 Q What is USB Go?
17 A Sorry?
18 Q What is USB Go?
19 A It's a type of interface within the USB standard.
20 Q What's it do?
21 A Enables communication between the USB modem, and
22 the computer.
23 Q What is a USB modem?
24 A A USB device that has a USB connection and also
25 has modem functionality.

1 Q Is USB Go applicable in anything else?
2 A I don't see why not.
3 Q Where else have you seen USB Go used?
4 A That is not a question I've tried to answer. But
5 any application of the USB standard where you're using USB
6 Go interface. Basically, I suspect you can use it to
7 facilitate any kind of data transfer.
8 Q And where does that supposition come from?
9 A My knowledge and experience.
10 Q So if you were to try to answer my question of
11 where else have you seen USB Go used -- well, sorry. Let
12 me ask it a different way.
13 Can you try to answer my question of where else
14 have you seen USB used -- USB Go used?
15 A So that, I did answer. I don't have a specific
16 recollection in mind. It's not one that I needed to
17 identify in order to reach the conclusions that are in the
18 declaration as to other instances in which USB Go is used.
19 So I'd have to give it some thought, but I don't have one
20 that specifically comes to mind.
21 Q What's a composite device?
22 A Depends on the context. Usually, it's one that
23 includes multiple functions and might use multiple or --
24 or might be installed as a device that uses -- or supports
25 multiple USB modes.

1 Q So if you look at paragraph 36 of -- have we been
2 pronouncing it "Deforche"?
3 A I have. You've been saying something else.
4 Q I've been trying to get on your -- your
5 pronunciation. So let me try again. If you look at
6 paragraph 36 of Deforche, towards the very end of that
7 paragraph, at the top of column 8, talks about a few
8 different -- I think USB modes; is that right?
9 A Yes.
10 Q So there it describes a composite device with USB
11 HID and USM mass storage unit device with UMS and HID USB
12 ID.
13 A Yes.
14 Q A lot of acronyms. What does that mean?
15 A Yeah. So what it says is there's different modes
16 for what USB can support, their interfaces. So you can
17 treat a device that you plug in as, you know, a hard drive
18 or a human interface device. There's actually a mode or
19 an interface within USB that allows you to combine those
20 interfaces and so have multiple interfaces together. That
21 gives you the flexibility of if you have a sophisticated
22 device that has -- that supports multiple sets of USB
23 commands simultaneously that you can mount it or expose it
24 in multiple ways at the same time.
25 Q Does that then require the use of two

1 simultaneous USB drivers?
2 A There would be two drivers in use, yeah.
3 Q Or at least one for how many numbers -- number of
4 different --
5 A Interfaces --
6 Q -- USB modes?
7 A -- that are part of the composite.
8 Q Okay. So MSD, or mass storage device, is that
9 unique to USB?
10 A It depends on if it's capitalized or not.
11 Q Let's say it is capitalized.
12 A Then it's specific to USB. Unless something else
13 is using that as a proper noun to describe its interface.
14 But as you see it in paragraph 63 of Deforche, it's
15 describing one of the interface types for USB. So if you
16 look up the USB spec, it would define that interface type.
17 Q And what does a mass storage device driver in the
18 USB context allow for?
19 A It's what the standard says. I don't have it
20 memorized to the point that I could give you a succinct
21 answer.
22 Q How about a human interface device, HID, also
23 capitalized?
24 A Same answer. So there's a set of --
25 primitive set of commands for both of those that can be

1 executed across the interface once it's mounted or
2 exposed. And so, I mean, the common ones for mass storage
3 device would be things like read and write. So it would
4 be the command set that can be exchanged across that kind
5 of interface.
6 Q Okay. Can you go to paragraph 36 of your
7 declaration for me?
8 A Okay.
9 Q So 36 is setting up a number of things that you
10 considered in determining the skills of a person of
11 ordinary skill in the art; right?
12 A Yes.
13 Q Do you offer an opinion on what the level of
14 skill in the art would be?
15 A Paragraph 37 says I've been asked to assume.
16 Q Which is why I ask.
17 A Right. And so I'm checking. I think that's what
18 I have assumed, and I think it's a reasonable definition.
19 Q So when you say that you have been asked to
20 assume, that's what you did; you made that assumption for
21 the purposes of your declaration?
22 A I did. And then it's consistent with what I
23 think it should be.
24 Q Do you know where it came from?
25 A I don't. I don't recall if there was a need to

1 establish a definition in the district court case before
2 these were filed or not.
3 Q And so in paragraph 36, one of the sentences
4 is -- it's the second to last one. It's talking about the
5 types of problems that such techniques give rise to and
6 the rapidity with which innovations were made. Do you see
7 that?
8 A Yes.
9 Q What kind of problems did such techniques from
10 the proceeding sentence, I assume, give rise to?
11 A The kinds of problems that existed really start
12 in the mid 90s and were largely resolved by the time you
13 get to 2010. But things like being able to connect a
14 variety of peripherals to a particular computer starting
15 off with simple things like keyboards and mice, displays.
16 But over the course of the next few years, as those types
17 of devices grew in sophistication and variety, it required
18 better support for being able to automatically identify
19 and use particular drivers.
20 So that, in large part, took place over the later
21 half of the 90s and into the 2000s. More specifically as
22 it relates to the idea of using things like wireless
23 transmission for audio/video data. Within that field,
24 there were issues around just capacity and what you could
25 send. Those were also largely resolved by 2010 with

1 respect to the wireless protocols that existed, especially
2 in the local area network context. And those kinds of
3 solutions, those hardware-based solutions in coding
4 techniques, audio/video repair in lossy environment
5 techniques were all things that were developing kind of in
6 that timeframe.
7 And then with respect to kind of the simple
8 application of taking what was on a screen of a PC or a
9 laptop being able to use a wireless transmitter and then
10 connecting that to a projector. That was also technology
11 that was developing in this timeframe.
12 So generally, you consider the types of problems
13 that were being addressed in the timeframe. I don't think
14 the way that sentence is worded should be interpreted to
15 say that there were unresolved problems. The patents
16 allege that there were problems that were unresolved and
17 that they addressed. Ultimately, that's why we're here
18 because I disagree. So the problems referenced here are
19 of the general nature based on the topics described in the
20 sentence that proceeds it.
21 Q And if you go one page back to the bottom of page
22 21, talking about the -- I think the date that you are
23 using for your analysis; is that right?
24 A That's what I've also been asked to assume.
25 Q The last sentence says, "Even if a modestly

1 earlier or later date were selected would not alter your
2 opinions." Do you see that?
3 A Yes.
4 Q What's a modestly earlier or later date?
5 A So modestly later date would be a year or so.
6 The reality is, if the priority date were moved forward,
7 that would expose even more prior art and knowledge a
8 person of skill in the art would have had. So to any
9 extent, it would have enhanced the opinions that I would
10 have had.
11 In terms of modestly earlier, 2010, 2009, the
12 technology at issue in these patents and what existed in
13 the prior art as well as the state of the art was
14 something that was relatively well developed within a
15 decade after the advent of the USB standards, which was
16 about '96 or '97. So I think you could have about a
17 decade of innovation post-USB and get to maybe 2006, 2007
18 and the underlying concepts were things that would have
19 been well understood by a person of skill in the art.
20 Potentially getting back to 2006, might predate
21 some of the references. But, you know, that's why there
22 are multiple grounds and multiple options as secondary
23 references to support the concepts that they demonstrate.
24 MR. HALVERSON: Why don't we take a quick break.
25 THE STENOGRAPHER: Off the record at 12:10 p.m.

1 (Off the record.)
2 THE STENOGRAPHER: Back on the record at
3 12:37 p.m.
4 BY MR. HALVERSON:
5 Q Dr. Almeroth, are you aware of any preinstalled
6 generic drivers for bidirectional video communication?
7 A Yes.
8 Q What?
9 A Pretty much any of the USB drivers, as one
10 example of a set of drivers. Bidirectional video is
11 really just data in two directions. You can use mass
12 storage generic drivers to do rewrites. We've actually
13 done work in our lab -- I'm trying to think if we've
14 published papers on it where you have devices masquerade
15 as another kind of device to use some of the USB drivers
16 and then once you have those drivers in place and data
17 being able to flow, then video data bidirectionally is
18 just data. So you can read, write data.
19 In some of the drivers that are -- like, the USB
20 Go, they are more amenable to synchronized data streams.
21 Like, audio and video is independent channels. So, yeah,
22 I think there's lots of applications that can be built on
23 top of generic drivers to do audio/video transfer.
24 Q And are you aware of any preinstalled generic
25 drivers for screen scraping?

1 A Yes. Data is data; right? So whether it's
2 real-time audio/video, whether it's audio/video from a
3 file, whether it's video scraped off of a screen, its
4 source doesn't affect the use of the transfer channels
5 that can be created.
6 Q And when you reference some work in your lab,
7 which lab is that?
8 A Networking and multimedia systems lab.
9 Q Is that here at University of California, Santa
10 Barbara?
11 A Yes.
12 Q And when was that work taking place?
13 A In the early to mid 2000s.
14 Q And what are you looking at right now?
15 A Looking at my CV. We had an effort called a
16 digital classroom where, in the early 2000s, we were
17 trying to put as much technology into a classroom as
18 possible. So we had multiple cameras. We were including
19 remote students and we were taking video of the remote
20 students and projecting it on the back of the classroom so
21 that, as an instructor, I could look out over the range of
22 students and I would see the remote students as video in
23 the back of the class. We were recording instructor
24 video, classroom video, audio, screens, synchronizing it
25 all together. We were using real-time video encoders by

1 companies like Vbrick. And so we had a heavily
2 technologically sophisticated classroom.
3 Actually one of the things we didn't have but we
4 had elsewhere on campus was screen sharing among the
5 students' laptops or computers where somebody would write
6 something or type something and I could project it on the
7 screen. We had a separate PC lab on campus where there's
8 a computer lab. All the students were at computers, and
9 the instructor could say, you know, "So and so, I'm going
10 to project what's on your computer."
11 And so it -- in that context, we were collecting,
12 sending, recording, storing multiple different streams of
13 media content. Connecting cameras through at least custom
14 interfaces, custom drivers, they were, like, Sony cameras.
15 But there's a bunch of publications in that timeframe that
16 describe some of the digital classroom technology.
17 Student -- what's her name? I think I can find the
18 publication. I can use it as an example.
19 Q M. Turk, a remote teaching assistant support
20 system?
21 A Which one is that?
22 Q It's a research grant from 2004.
23 A Oh, so research grant, yes. With Matthew Turk
24 for -- to support some of that. This is -- let me just
25 find an example, and I can -- so the student was Sami

1 Rollins, S-a-m-i, R-o-l-l-i-n-s, who's got a bunch of
2 papers on page 15 of 40 of the CV.
3 Q So we talk -- did we talk about her before? Her
4 name sounds very familiar.
5 A I don't recall if you did much background in
6 either of the other two depos. But I've always had on tap
7 the -- the classroom stuff.
8 So things, like on page 15 of 40, paper 27,
9 demarcation point between content production and encoding
10 in a digital classroom. So that's the production side
11 versus the creating the archive side. 28, managing
12 complexity in a networked learning environment.
13 And so the students -- Jonathan Humphrey was a
14 master student, Sami Rollins was a Ph.D. student,
15 Jung-Ying Chen [sic] was a Ph.D. student, Bruce Bimber was
16 a collaborator in political science. So those were kind
17 of the set of students that show up on a bunch of these
18 papers. There's a bunch on 16 as well.
19 Q And so a couple of answers ago, you had said in
20 response to a question about preinstalled generic drivers
21 for screen scraping, you said, "Yes, data is data, right,
22 whether it's real-time audio/video, audio/video from a
23 file, video scraped off a screen, the source doesn't
24 affect the use of the transfer channels that can be
25 created."

1 Do you recall that?
2 A Yes.
3 Q So if that's the case, why are there different
4 kinds of drivers?
5 A Different kinds of drivers depending on what
6 level of functionality that you want to be able to build
7 into the application and how much of the balance of
8 complexity you put in the driver versus into the
9 application itself.
10 So if you're using a transfer channel that I used
11 in the previous answer that's fairly basic and doesn't
12 provide much support, then the application has to
13 implement all of the time synchronization loss
14 regeneration, any of that kind of functionality.
15 In some cases, there are composite channels that
16 provide the synchronization for you or you just use one
17 channel and you put a system stream through it, so it's
18 already synchronized audio and video, but then you might
19 have a separate channel for data like what's on a screen.
20 So you either can use a more sophisticated instruction set
21 at the channel level or you can use kind of basic transfer
22 channels and then build the sophistication into the
23 application itself.
24 And so you see that across the different
25 interfaces or modes of USB. Some of them are very basic,

1 like you just treat the channel as a mass storage device
2 on the other end. So it doesn't do much processing. It
3 fundamentally just has read and write primitives to it.
4 You could even use that to do -- to transfer live
5 real-time video by just doing a lot of writes or you can
6 use other interfaces that have more sophisticated
7 functionality, like timing and things like this.
8 So ultimately, again, it sort of becomes a design
9 choice in terms of which -- which interface of USB or
10 whether you use USB or whether you use something else.
11 Q And that -- that effort in your lab in the early
12 2000s, did it have a name?
13 A We generally just called it the "digital
14 classroom." And it's probably referenced in some of those
15 papers and just as the digital classroom. On the page 16,
16 we had it deploying an infrastructure for technologically
17 enhanced learning. But it should have just been the
18 digital classroom. I don't think we released any software
19 from it. Let me see.
20 I don't see anything that was really about the
21 whole system itself.
22 Q And was that -- did that system use USB drivers?
23 A I believe it did.
24 Q For audio?
25 A My recollection is that the interface between

1 the -- the hardware and coders was USB based. So that was
2 from companies like Vbrick.
3 In the earliest days of the effort, the ability
4 to do real-time NTSC-level encoding required, basically, a
5 pizza box. And then over time, the form factor for how to
6 do real-time encoding in hardware became much, much
7 smaller, even to the point of being on a USB drive -- USB
8 stick.
9 Q Would the same answer apply to video?
10 A The same answer would apply to video. I was
11 answering about video. Audio would actually be easier
12 because it's -- it's less intensive to process. So we
13 didn't need, like, a -- a pizza box hardware to -- to
14 encode audio.
15 Q And when you say "pizza box," are you using that
16 to describe the size of the hardware that was necessary or
17 something else?
18 A Yes. And it's a little bit further 'cause it's
19 kind of the -- the size and shape that fits into a rack
20 mount of equipment. It's, like, one of the layers. You
21 can stick it in there and... 2 feet wide, 6 feet high. It
22 can have cooling, sound dampening, then horizontal slots
23 for equipment.
24 Q Okay. Is there a difference between a mirrored
25 display driver and a video driver?

1 A I would think so.
2 Q Go to paragraph 94 for me. It splits page 20 --
3 sorry -- page 60 and 61 of your declaration. I'm going to
4 ask about something on 61, but --
5 A Sure.
6 Q -- feel free to look at whatever.
7 A Okay.
8 Q So there's a sentence in here that says,
9 "Combined system would provide at least a better/higher
10 quality transmission of audio-visual data." Next sentence
11 talks about how having separate drivers for separate data
12 streams helps provide that benefit.
13 Why do you -- how -- what part of separate
14 drivers for separate data streams allows for higher
15 quality transmission?
16 A So that is specifically what comes through Ahmed.
17 So let's see... 1826.
18 Yeah. Okay. So what Ahmed specifically
19 describes here as a solution is using a combination of TCP
20 and UDP. The problem with TCP for a real-time stream is
21 it doesn't deliver data to the application if data has
22 been missed. So let's say, if you send packets 1 through
23 5 and packet 3 is missed, it will send -- the receiver
24 will forward packet 1 and 2 to the application so it can
25 be decoded and displayed or played. If 3 is lost, 4 and 5

1 are held in a buffer. It sends back an acknowledgment
2 that indicates to the sender that 3 was missed. So then 3
3 is sent, and then 3, 4, and 5 are delivered.
4 Having to stop and wait for retransmissions of
5 data introduces jitter and delay to the transport process.
6 You can do that with audio data because it's generally
7 less bandwidth and doesn't consume or cause the kind of
8 congestion that video data does. So you could use TCP
9 across one of the channels for audio data and then deal
10 with video data separately and then use UDP for video
11 data. You can attempt to do a retransmission for video
12 data but, generally, it's best to do full steam ahead.
13 Maybe you get a -- an artifact on one of the image frames
14 at 30 frames a second. It lasts for a fraction of a
15 second and is usually not noticed by a person.
16 So this is an instance where using sort of more
17 basic -- a more basic channel for video will allow the
18 video to not be delayed based on losses that occur but
19 then deal with audio differently because, in some cases,
20 losses are more aurally perceptible. And you don't have
21 to do the stop and wait, or you can do the stop and wait
22 for audio data because the retransmission can happen more
23 quickly.
24 So there is an instance where it makes sense,
25 because of the different characteristics of the data, to

1 do the transmission of one versus the other using
2 different types of channels, which would mean different
3 kinds of drivers and different interfaces across USB. And
4 that's -- Ahmed talks about that in kind of the second
5 half of this first citation when it talks about the hybrid
6 TCP/UDP protocol and the real-time transmission.
7 Q And your different kind of drivers -- sorry. Do
8 different kinds of channels necessarily mean different
9 kinds of drivers?
10 A In the context of Ahmed, in this particular
11 section, yes. More generally, no. You could design a
12 system and implement a system in lots of different ways
13 (indicating).
14 Q In which portion of Ahmed are you pointing to?
15 A Page 19, starting about line 10 through to the
16 end of the discussion, which, principally, ends about
17 20 -- at 25.
18 Q And so there are two page numbers at the bottom
19 of each page of Ahmed.
20 Are you referring to the larger page number or
21 the page blank of blank?
22 A The larger page number. The -- that is
23 consistent with the numbering scheme used in the
24 declaration. So the declaration cites to Exhibit 1014,
25 page 18, 26 through 1921. So I'm using kind of that page

1 numbering.
2 Q And sorry. Which page of the declaration did you
3 say had that cite? Or which paragraph of the declaration?
4 A Ninety-four.
5 Q So paragraph 94 cites to 18, 26, to 1921. And
6 then passage of Ahmed that you just talked about was the
7 passage that begins on 19 at line 10 and goes through 20
8 at line --
9 A 25.
10 Q -- 25?
11 A Yeah. So it's -- the -- the overview is covered
12 by that first cite, 1921. And then it goes into kind of
13 the detail of how that hybrid protocol works. And it
14 starts at line 21. It says, referring to figure 6, "An
15 embodiment of the above-mentioned TCP/UDP hybrid protocol
16 is depicted." That actually provided the explanation that
17 was in response to your specific question about why it's
18 better.
19 Q And so where in there does it talk about multiple
20 drivers? 'Cause I think my -- so my original question in
21 here was, do different kinds of channels necessarily mean
22 different types of drivers? And you said, "In the context
23 of Ahmed in this particular section, yes."
24 A Yeah. So you're do -- you're using different
25 drivers tied to the different transmitted streams.

1 Q So this would be the driver that allows for the
2 TCP stream, and then --
3 A You --
4 Q -- based on your -- sorry. One more --
5 A Yeah.
6 Q Base -- based on how you read -- or how you opine
7 a person of ordinary skill in the art would read this,
8 there would be another driver for the UDP stream for the
9 video data?
10 A Mm... I would reverse the last two clauses of
11 each of those. It's -- it's the driver for the audio
12 stream, which can use TCP, and then the driver for the
13 video stream, which can use UDP.
14 Q And is this for the transmission from what to
15 what?
16 A This is for the transmission of the media from
17 the computer through the USB device and then onto the base
18 station.
19 Q And which USB device is that?
20 A I don't understand the question.
21 Q You said, "This is for the transmission of the
22 media from the computer through the USB device and then
23 onto the base station."
24 My question was: Which USB device is that?
25 A So that is Kaplan's USB device. This is where

1 that functionality of Ahmed is being applied to the
2 architecture described in Kaplan or in Maeda.
3 Q Got it.
4 A And there's the second -- briefly, there's the
5 second cite here, page 27, 1 through 27, that goes into,
6 also, additional detail about the use of different
7 sockets. Those sockets would tie to one for audio, one
8 for audio, TCP and video, as it's described here. And
9 then this is also the portion where it says it's preferred
10 to transmit the media data streams separately.
11 Q Would a hybrid TCP/UDP protocol be slower than
12 just a UDP protocol?
13 A So I'd have to modify the question. It'd be a
14 hybrid TCP/UDP system. UDP and TCP are the protocols. So
15 it's -- it's a hybrid using both of those.
16 Would it be slower? In almost all instances, no.
17 Q And so I was just -- I'm using the words from
18 Ahmed on page 19, line 18.
19 A Oh, okay. Where it -- yeah.
20 Q It says, "a hybrid TCP/UDP protocol."
21 A Okay.
22 Q So do we want to redefine what Ahmed is
23 describing?
24 A No. It's -- it's --
25 Q Or is it just a little loose or what?

1 A It's actually the use of two -- of both
2 simultaneously. I think of a hybrid as combining the two
3 into one. It's fine. I -- you know, Ahmed can call it a
4 hybrid. But it -- it describes them as -- as two separate
5 sockets -- two separate transmissions.
6 Q So two parallel paths?
7 A Two parallel paths.
8 Q And so you said it does not slow it down?
9 A In -- in -- in almost no scenario is it slower.
10 Q So UDP doesn't involve retry requests; correct?
11 A Not as part of the protocol itself.
12 Q And so in your example, the five packets were
13 packet number -- do you recall which one was dropped?
14 A Three.
15 Q Where packet number 3 was dropped, 3, 4, and 5
16 had to be retransmitted in the TCP scenario; right?
17 A Not quite. 3 would have to be transmitted --
18 retransmitted. 4 and 5 would be held at the receiver
19 because TCP has a requirement that data is delivered to
20 the application in order. So it would be held at -- at
21 basically the socket layer or the TCP layer.
22 Q So 4 and 5 are buffered?
23 A Depending on the version of TCP. Old versions of
24 TCP would -- would throw away 4 and 5, and you would start
25 over at 3. Later versions of TCP have this thing called a

1 "selective reject," where it would say "I didn't get 3,
2 but I got 4 and 5. Just send 3," and then it would
3 deliver everything as a chunk. So it's -- it's an
4 implementation detail of TCP.
5 Q And when did we go from old to new?
6 A It's continually evolving. TCP started in 1988.
7 This functionality of selected reject, selective repeat
8 was probably early 2000s.
9 Q And so if, in the TCP scenario, I need to
10 transmit a retry request for at least one packet, possibly
11 three packets in this example, and then wait for those --
12 that or those packets to arrive before passing 3, 4, and 5
13 onto the application in a UDP scenario where 3 has been
14 lost but I've already received 4 and 5, I can pass 1, 2,
15 4, and 5 on to the application right away without the
16 round-trip time of the retry request; right?
17 A Yes.
18 Q And so why is the UDP implementation not faster
19 than the TCP implementation?
20 A Because it's not an apples-to-apples comparison.
21 You're not actually delivering all of the data. And so
22 if -- I mean, really, the question is: So is delivering
23 3, because you've retransmitted it, faster than never
24 having delivered it at all? It's not really a "one is
25 faster than the other" kind of scenario.

1 Q And you're saying that because the quality of the
2 end product is not as good without whatever the content of
3 packet number 3 is; right?
4 A Correct.
5 Q Could you have separate data streams using a
6 single driver?
7 A I think you could do an implementation that way.
8 It's certainly one of the choices.
9 Q You still have your declaration?
10 A I do.
11 Q Top of 90 -- paragraph 95 says, "Deforche
12 discusses in detail methods and devices for the wireless
13 transmission of data."
14 Do you see that?
15 A Yes.
16 Q Why is that relevant?
17 A That is a little bit vague. But, generally, the
18 motivation that I use to rely on Deforche for is the idea
19 that you can have preinstalled generic drivers to
20 accomplish particular functions associated with the use of
21 USB and -- and drivers. So I think this first sentence is
22 helping to establish that at least that particular
23 functionality is -- is the same field of endeavor.
24 Q The field being wireless transmission of data?
25 A Methods and devices for wireless transmission of

1 data. And it goes beyond that. It also has the "for
2 example" portion.
3 Q And so that passage of Deforche is relying on a
4 communication between a wireless modem device and a
5 computer device; right?
6 A When you -- you mean when it references the
7 abstract in paragraphs 9 and 11 of Deforche?
8 Q No. The next sentence that you flagged that said
9 it also has the "for example" portion.
10 A Okay. So that includes connecting a host
11 computer to a wireless network and then through a network
12 interface that uses a preinstalled generic driver.
13 Q Okay. Go to the top of the next page, same
14 paragraph 95. And again, feel free to flip back if you
15 want to. You've got a sentence here that says -- or yeah,
16 it says in the middle of it neither Kaplan nor Ahmed
17 specifically refer to drivers as preinstalled generic
18 drivers.
19 Do you see that?
20 A I do.
21 Q And are -- okay. Never mind. I see that.
22 What is it about preinstalled generic drivers
23 that make a system easier and more efficient?
24 A Easier. They're preinstalled. They're generic
25 that they apply across a class of devices. One of the

1 annoying things about specific printer drivers is any time
2 a manufacturer, even an existing one, like HP, comes out
3 with a new model, then it takes time to get that driver
4 incorporated into the operating system.
5 Whereas if you have generic drivers for PCL and
6 PS, as long as a new printer supports one of those two
7 standards, then you can handle it with a driver that's
8 already installed. So there's the preinstalled that makes
9 it easier, more efficient. There's the generic drivers
10 that are sufficient to accomplish whatever functions are
11 associated with devices that use that interface or mode.
12 And so you don't have the issue of shipping a CD-ROM or a
13 diskette or requiring internet access to download a
14 driver, whether it's generic or specific. And then being
15 more likely to have to download a driver if it's something
16 that's specific.
17 Q Why doesn't it come on the device?
18 A So, certainly, you can include a driver on a
19 device, but then you need a different driver for different
20 operating systems. Different bit width, whether it's a
21 32-bit system or a 64-bit system. And so now you need a
22 whole set of drivers that are particular to the operating
23 system that that device can operate with. And if you
24 don't cover all operating systems, then you're back to
25 square one of having to either download something off the

1 internet. And it's certainly evident, based on the
2 success of USB, that it supplanted standards like FireWire
3 and PCMCIA and basically became, literally, universal with
4 respect to whole classes of devices soon after its
5 development as a standard and is still widely used today.
6 Q Do you know approximately how large the file size
7 is for a driver?
8 A Depends on the driver, depends on the system. It
9 can range from a few hundred kilobytes to hundreds of
10 kilobytes. And that's for each instance of a driver. So
11 if you have -- if you're, say, having a set of drivers
12 that would handle any operating system or any platform,
13 then that's multiplied by the number of instances you
14 need. Other drivers can be compressed. So it -- again, I
15 would guess it's a fairly broad range of possibilities for
16 driver sizes. Printer drivers, I think, at one time
17 included things like fonts and so they could be multiple
18 megabytes in size.
19 Q Are you familiar with SOC or system on a chip?
20 A Yeah.
21 Q What is it?
22 A System on a chip. The system is literally on a
23 chip. Some sort of component-sized form factor.
24 Q So Ahmed's SOC for transmission of graphical and
25 audio device, is that an integrated component into the PC

1 of Ahmed?
2 A For at least the SOC embodiment, it's something
3 that you could integrate into the device itself. My
4 recollection is there are multiple embodiments. And then,
5 again, with respect to the functionality of Ahmed versus
6 the architecture of Kaplan, it's the structure of Kaplan
7 that I'm relying on, or made of.
8 Q So we talked a lot about drivers in the context
9 of personal computers and peripheral devices for personal
10 computers. They're drivers on other devices such as
11 phones, TVs (indicating), things like that?
12 A Yes. Depends on the TV. Yes, on phones. Smart
13 TVs, yes.
14 Q So anything with a data connection -- sorry. Let
15 me ask that differently.
16 Anything with a networked data connection?
17 A Not necessarily. So for embedded systems that --
18 they may use kind of the equivalent of a driver, but it's
19 not modularized in the sense of you'd have a driver that
20 you would download and install. Because it's essentially
21 a mono -- like a TV could be a monolithic operating
22 system, it's just written into the operating system how to
23 interface with the hardware components. You could have a
24 TV that has a USB interface to it where you could plug in
25 a memory stick with a video that it might play or a

1 firmware update. In that instances, it would use more of
2 a -- or USB-style preinstalled drivers for the interfaces
3 or modes that USB supports. I'm now seeing some TVs that
4 actually run the Android operating system, so they're
5 going to have more traditional kinds of drivers from that
6 perspective.
7 Your phone certainly has UPnP capability.
8 That -- well, I mean, it has -- might have USB-C. And so
9 it will have drivers depending on the kinds of components
10 that it can connect to. But, I mean, there's lots of plug
11 and play functionality or UPnP functionality for
12 discovering printers. Things like AirPlay, screen
13 sharing, all will have some sort of driver to the network
14 interface to tie what's on the screen to what's sent over
15 the network for display.
16 Q Do you have Kaplan in front of you still?
17 A Yes.
18 Q 1027. Go to paragraph 46 for me.
19 A Okay.
20 Q It's talking about how the transmitter may
21 identify itself to the computer 220 as a mass storage
22 device. Do you see that?
23 A I do.
24 Q When the transmitter is identified as a mass
25 storage device, is it able to transmit audio information?

1 A What's the "it"?
2 Q Is the computer able to transmit audio
3 information to the transmitter when the transmitter has
4 identified itself as a mass storage device?
5 A Yes.
6 Q How?
7 A So two ways. One is it's audio data. You could
8 send over an audio file or a file of audio data to store
9 on the mass storage device. As I described earlier, it's
10 a channel for sending and receiving data writes and reads.
11 You could even send real-time generated audio as a read
12 across to that particular device and then that device can
13 faithfully act as a mass storage device and save it, or it
14 can wirelessly transmit that over the network based on
15 programming it as an -- in the device itself. It's kind
16 of what I described earlier, a way of using a basic
17 interface or a mode and then data is data and you can send
18 it. And once it's received, the device can do anything it
19 wants with it.
20 Q And how does the transmitter identify itself as a
21 mass storage device as opposed to -- another example it
22 gives is --
23 A Can do the human interface design -- device, the
24 HID.
25 Q Yeah. How does the transmitter present itself in

1 that manner?
2 A So the way it presents itself in that manner is
3 through the UTS -- USB setup. That when you plug a USB
4 device into a computer, there's a setup process where the
5 capabilities are exchanged back and forth, what can you
6 support, what modes can you support, what modes do you
7 want to use, the parameters of -- of that are according to
8 the USB standard. And ultimately, once that negotiation
9 process happens, the mode is identified and accepted, then
10 now you have a channel over which data is communicated.
11 Q Can you go to paragraph 111, which you're maybe
12 at or near, of your declaration? So I actually want to
13 ask about the sentence that appears at the top of page 74,
14 but go ahead. Read the rest.
15 A Yes.
16 Q So you say that a POSITA, person of skill in the
17 art, would have also had a reasonable expectation of
18 success in implementing such standard software
19 particularly given the teachings -- sorry, particularly
20 given the teachings of Deforche.
21 Do you see that?
22 A Yes.
23 Q Which teachings of Deforche are those?
24 A Specifically with respect to the use of the
25 preinstalled generic drivers in the context of USB to

1 accomplish the functionality of data transfer between the
2 computer and the transmitter ultimately to a base station
3 and projector. Those are the teachings both in the
4 context of the limitation identified from Deforche as well
5 as the background of Deforche as it's described in the
6 first part of the declaration.
7 Q And does Deforche talk about generic audio
8 drivers?
9 A I don't recall if it uses those words exactly,
10 but I think, in concept, it absolutely does since it talks
11 about transmission of data, though I think I'd have to go
12 back and check. My reliance on audio data and video data,
13 that comes from Ahmed and Kaplan.
14 Q Does Deforche teach generic video drivers?
15 A That'd be the same answer. It's not the basis
16 for why I've relied on Deforche, but it might say
17 something along those lines.
18 Q The basis is the fact that it teaches
19 preinstalled generic preference?
20 A Not the basis, but that's -- that's its role, to
21 demonstrate the preinstalled generic drivers were both
22 widely known and used in the particular scenarios
23 contemplated by Kaplan together with Ahmed.
24 MR. HALVERSON: All right. Let's take another
25 break.

1 THE WITNESS: Okay.
2 THE STENOGRAPHER: Off the record at 1:28 p.m.
3 (Off the record.)
4 THE STENOGRAPHER: Back on the record at
5 1:35 p.m.
6 MR. HALVERSON: All right.
7 BY MR. HALVERSON:
8 Q You still have Maeda in front of you,
9 Exhibit 1031?
10 A I do.
11 Q And so feel free to look at figure 1. You've got
12 an annotated version of figure 1 and paragraph 158 of your
13 declaration. Either one is fine by me.
14 A Okay. I'm at 158.
15 Q And so in the beginning of 158, you talk about
16 how Maeda describes coupling a wireless LAN card
17 physically attached to the PC. Do you see that?
18 A Yes.
19 Q What's it coupled to?
20 A I don't understand the question.
21 Q So coupling applies to second device; right?
22 A It does.
23 Q So if it's physically attached to the PC, are you
24 saying that the coupling is the process of attaching it to
25 the PC or is the sentence missing a clause that's talking

1 about to a device or a device to which the LAN card is
2 coupled?
3 A So it's really -- I mean, for claim 1, limitation
4 is coupling an external peripheral device physically to
5 the port of the processing device. That's what it's
6 describing, when you connect the wireless LAN card to the
7 PC, that is the coupling.
8 Q And so is this LAN card of Maeda a removable
9 device?
10 A My recollection is that it was or is.
11 Q And what is that based on?
12 A Well, you can see in the figure, it's external to
13 the PC. It's described as a card. A person of skill in
14 the art would at least understand that that would include
15 a typical wireless LAN card that could be plugged into a
16 PC. As to whether or not it can be removed or not, I
17 don't have the reference memorized enough to know if
18 there's something more explicit than that. I don't see a
19 requirement in claim 1 where it requires coupling or
20 decoupling. Getting the wireless LAN card of 10 attached
21 to the PC whenever that happens would be sufficient to
22 meet the coupling requirement of at least claim 1. But
23 there might be some other portion of Maeda that talks
24 about it being removable and reinsertable.
25 Q Are you aware of that portion, as you sit here

1 today?
2 A I -- I don't have that portion memorized. So I
3 mean, it looks like you can do it based on figure 1, but
4 I'd have to look further in Maeda to see if it says
5 anything more. The idea that it's a wireless LAN card
6 goes pretty far in, teaching to a person that's skilled in
7 the art, kind of a common use of a wireless LAN card at
8 the time of being able to plug it in and unplug it.
9 Q And you may have said this, and if you did, I
10 apologize: What is PCMCIA?
11 A I do -- I don't remember what the acronym stands
12 for. It's been 15 years. I -- I would just be guessing,
13 I's are interfaces and C's are communications or personal
14 computer, and M is modular or something.
15 Q Does the context in paragraph 161 help at all for
16 you? It just says, "although the old PCMCIA standard used
17 with LAN cards."
18 A You said --
19 Q 161?
20 A Yes. It -- it doesn't help. It's -- like,
21 personal computer modular communication interface
22 association something.
23 You're online. I'm not. If we were in a remote
24 depo, I'd Google it for you.
25 Q It's a good idea. Let me see.

1 Personal Computer Memory Card International
2 Association?
3 A That sounds about right.
4 Q Do you know what the speed that those LAN cards
5 supported?
6 A The old ones -- I was familiar with the Lucent
7 ones -- they did at least 80211B. So that would have been
8 max, according to the standard, of 11 megabits per second.
9 I could have sworn they also, at some point, had a gold
10 version that supported 80211A. So that would have gotten
11 you 45 megabits per second. I don't know if they ever
12 made a G or an N version for PCMCIA. Those would have
13 gotten you higher speeds than that. Sorry. 54 megabits
14 per second, not 45.
15 Q So earlier today, we were talking about Kaplan
16 and the remote control of Kaplan.
17 Do you remember that?
18 A I do.
19 Q If you look at figure 1 of Kaplan and figure 2 of
20 Kaplan, I guess, you see a variety of different
21 descriptions and labels on receiver 110, pretty much
22 nothing on transmitter 120 other than the USB plug, and
23 then you see some labels on the buttons of remote
24 control 130; right?
25 A Yes.

1 Q Do you still have Kaplan open?
2 A Yes.
3 Q Go to figure 5 for me.
4 A Okay.
5 Q And so looking at figure 5, which ends with step
6 522, package the paired wireless communication devices, do
7 you see that?
8 A I do.
9 Q So is it your understanding that the flowchart of
10 figure 5 is describing something that is occurring at the
11 site of manufacturer or at least presale of the devices?
12 A Paragraph 14 says, "Figure 5 is a simplified
13 flowchart illustrating a method of manufacturing the
14 communications system, according to an embodiment of the
15 present invention." Whether or not all of those steps are
16 exclusively as part of the manufacturing process, I'd have
17 to go and look. Depends on what Kaplan says about
18 figure 5.
19 Q If you look at paragraph 55, last sentence says,
20 "In contrast with conventional wireless systems in which
21 pairing is performed after delivery to the user,
22 embodiments of the present invention provide an ease of
23 setup and use not available with conventional systems."
24 Do you see that?
25 A I do.

1 Q When the plural "embodiments" is used in that
2 paragraph, do you interpret that to refer to all of the
3 other disclosed embodiments or just a plurality of the
4 disclosed embodiments?
5 A I -- my initial reaction is that it's just a
6 plurality; it's not all. I'd have to look and see just
7 what the context is. Ultimately, whether it -- it applies
8 it to all embodiments or not, it's not my recollection
9 that that would -- characterization would carry the
10 disclosures of Kaplan outside the scope of how I've relied
11 on them.
12 Q Okay. I think, pending anything else from
13 Mr. Yang, that's all I've got on the 000 -- well, so we
14 can do background -- I assume your background doesn't
15 change across the different proceedings; is that right?
16 A Correct.
17 MR. HALVERSON: I'm happy to do background now.
18 I'm happy to do background later. We're all here and
19 going.
20 Do you want to do background today?
21 MR. YANG: We can just get it done, if you're
22 ready to do it now.
23 THE WITNESS: I'm ready.
24 MR. HALVERSON: Okay.
25 MR. HALVERSON: You good to keep going?

1 THE STENOGRAPHER: Yes, sir.
2 MR. HALVERSON: All right.
3 BY MR. HALVERSON:
4 Q Paragraph 22 of your declaration for me, please.
5 A Okay.
6 Q And I guess, as prec- -- precursor question, is
7 there anything in your CV, which is Exhibit 1003, that's
8 incorrect, needs to be changed, that you'd like to
9 supplement?
10 A There are likely some additional depositions and
11 trials since this declaration was filed with the IPR and
12 then probably some technical program committee work in the
13 third portion of 2024 and then 2025, which is not
14 represented in this. But everything else should be the
15 same in terms of history, students, research grants,
16 publications. Like I suspect, the A link district court
17 stuff isn't on here.
18 Q The --
19 A Claim construction.
20 Q -- claim construction and -- the -- whatever the
21 technical second thing was?
22 A Yeah.
23 Q Okay. How would you describe it?
24 A Noninfringing alternatives and other issues
25 around liability and damages.

1 Q We can go with that.
2 Paragraph 22.
3 A Yes, sir.
4 Q The ARO high-speed intrusion detection system --
5 A Yes.
6 Q -- is that a software intrusion or a physical
7 intrusion?
8 A Not sure about the or, but it -- it is largely
9 software based. But it does run on a hardware platform,
10 and it is for network-based intrusion detection.
11 Q So not high-speed projectiles but high-speed --
12 A Packets.
13 Q -- network detect -- network intrusions? Okay.
14 A Yes. Yes.
15 Q 24, paragraph 24, the Internet Engineering Task
16 Force, do you see that?
17 A Yes.
18 Q When was that exercise conducted? Or is it still
19 ongoing?
20 A It's still ongoing. My first involvement with
21 the IETF was in the 1994 timeframe. I've essentially
22 stayed in contact with all the working groups over time.
23 The one that's probably most active, the multicast -- the
24 MBONE deployment and the audio/video transport working
25 groups. I think most of the others are fairly finished at

1 this point.
2 THE STENOGRAPHER: End bone deployment?
3 THE WITNESS: Capital M, capital B-O-N-E.
4 BY MR. HALVERSON:
5 Q And are you currently teaching classes?
6 A I am not.
7 Q Did you teach classes last semester?
8 A I did not.
9 Q When was the last semester that you taught a
10 class?
11 A Fall 2020.
12 Q And so what were your duties as a professor
13 emeritus?
14 A I am essentially retired, though I can teach and
15 advise students, if I so choose to. I'm still active in
16 the field, and so that's why I still have an affiliation
17 with UCSB. But it's -- it's kind of the title you get,
18 not when you retire and die, but kind of retire and are
19 still in the field.
20 Q If you go to page 3 of your CV, it lists a series
21 of courses that have been taught.
22 Do you see those?
23 A Yes.
24 Q How many of those involved USB?
25 A Generally, 176A, 176B, maybe 201B for MAT, 276,

1 290I. I don't think many of the seminars got into USB,
2 specifically.
3 Q And are the seminars the 595s?
4 A Yes, sir.
5 Q And 176A, was it a portion of a lecture, a series
6 of lectures, or just mentioned in passing?
7 A Portion of a lecture.
8 Q Same question for 176B.
9 A Portion of a lecture.
10 Q 201B?
11 A Somewhere between a passive mentioning and a
12 portion of a lecture.
13 Q And 276?
14 A A portion of a lecture.
15 Q And 290I?
16 A Portion of a lecture. Maybe potentially more
17 than a portion.
18 Q And what was the -- feel free to pick your
19 preferred one.
20 What did you teach about it?
21 A Sure. I can do pretty much all of them in short
22 order. 70 -- 176A was essentially about the protocol
23 stack. And so the use of USB, where that would fall at
24 the protocol stack, what that would allow you to do for
25 transmission of network data over USB.

1 176B would be similar, though more -- 176B is
2 more from a practical perspective. So actually using USB,
3 generating sockets, sending data.
4 MAT 201B was kind of a combination of 176A and
5 176B for non computer science students. So covered more
6 material at a slightly higher level.
7 276 and 290I had project components where
8 students would implement projects, and at least some of
9 those projects, on numerous occasions, dealt with
10 USB-based communication.
11 Q And I didn't see a rate in your declaration.
12 What are you compensated?
13 A It was whatever my rate was at the time that we
14 signed the contract or that I agreed to the engagement
15 letter, which was mid-2024. I think, at that time, it was
16 850 an hour.
17 Q Has it gone up since then?
18 A It's now 900 for new engagements. It could have
19 also been 800, but it was whatever the standard rate was
20 at the time.
21 Q And approximately how long did it take you to
22 prepare the 127 pages that are your declaration in this
23 proceeding?
24 A Hard to say. Let me give you what I do know.
25 Just prior to the district court deposition, it was

1 300 hours approximately. That included the generation of
2 the district court report, I think about 50 hours on claim
3 construction, which meant about 200 hours for all of the
4 declarations. That also include [sic] a portion of kind
5 of ramp-up on reading the patents prior to actually doing
6 specific work related to the IPRs. And then that would
7 have been divided across the seven IPRs, more weighted to
8 the IPRs early in the process.
9 And then because I had familiarity with at least
10 some of the references in the style of claims, the number
11 of hours per IPR decreased over time. Ball park for this
12 one is probably in the neighborhood of 35 to 50 hours for
13 the declaration.
14 Q So 200 across the 7?
15 A Yes.
16 Q Okay.
17 A Yeah. That math works out.
18 Q And so if it was -- did you say 35 to 50?
19 A Yes. So more -- more work for the initial set of
20 declarations, and then it got to be less over time.
21 Q So 200 divided by 7 is 28.57 onward.
22 A Right.
23 Q So if that was on the high side, 150?
24 A No. It's -- it's a good 200. It's not 150.
25 Q Sorry. So if it's 200 for the 7 --

1 A Yes.
2 Q -- and if the first one was on the high side of
3 35 to 50 --
4 A Oh, so you're taking --
5 Q -- is 150 for the remaining six, these numbers
6 quickly get much smaller.
7 Do you know? Was there an inflection point where
8 they became much faster? Or did it kind of linear
9 progress -- or linearly decline?
10 A No. In -- because there's more over -- there's
11 varying degrees of overlap as you get into the later
12 declarations. I think the last three were -- were
13 especially -- what is it -- the 346 and the 347 had more
14 overlap. So it would have been pretty consistent decrease
15 over time.
16 Q Okay. And for the record of this particular
17 transcript, the district court deposition that you
18 referenced happened about a month ago; is that right?
19 A Yes.
20 Q Okay. And so time spent preparing for these
21 depositions would not be included in that roughly 200 for
22 the seven estimate?
23 A Correct.
24 Q Okay.
25 A Or review of the POPRs or the IDs.

1 Q Okay. And when we were talking about your claim
2 construction declaration some time ago, you had talked
3 about how you had designed drivers for peripheral devices
4 back in the day. I believe it was approximately when you
5 had -- it was when you had a master's degree before your
6 Ph.D.? Is that timing correct?
7 A That sounds about right. A lot of the system
8 building that we -- that I did as a grad student was in
9 that timeframe.
10 Q And what were you building drivers for?
11 A Kind of across multiple parts of the system. We
12 were interested in that timeframe and actually building
13 systems to do collection and coding, storage delivery
14 reception and play out of streaming audio data, video
15 data, and then later data data, meaning things like screen
16 captures that were kind of continued postgraduate school
17 in the digital classroom, you know, that's where we did
18 more of the screen sharing stuff. So it kind of started
19 as a grad student with streaming audio and video delivery
20 systems and then expanded to other environments and other
21 kinds of data over the next ten years.
22 Q Okay.
23 A And in all of those contexts, building the
24 underlying software, including drivers, socket support,
25 transport-level support.

1 Q And have you done any of those exercises post
2 Ph.D.?
3 A Yes. So that continued -- Ph.D. was '97. That
4 continued with largely the digital classroom work, but
5 there was certainly the use of drivers, programming
6 drivers in the wireless networking sense. So we had
7 projects on infrastructure mesh networks where we were
8 building drivers for access points. So less about audio
9 and video and more about just the -- the fundamentals of
10 multi-channel wireless networks.
11 Q Is Airplay, Inc., related to Apple's AirPlay?
12 A No.
13 Q Did you guys ever get into trademark wrinkles
14 with them?
15 A No. I think it was early enough before AirPlay.
16 THE STENOGRAPHER: Did you say trade -- I didn't
17 hear trademark --
18 MR. HALVERSON: Wrinkles. I -- I use technical
19 terms.
20 THE WITNESS: I -- I don't know that AirPlay --
21 that Apple would have trademarked it before 2009.
22 BY MR. HALVERSON:
23 Q And what did Airplay, Inc., do when you were
24 advising, if you recall?
25 A They were interested in sort of interactive

1 gaming for -- tied to real-world events. So it was in the
2 timeframe before iPhones really came out. So it was, I
3 guess, the old Samsung flip phones, and it was -- you'd be
4 watching a football game, and you would see the -- the
5 lineup, and it -- before some threshold, you had to guess
6 whether it was going to be, like, a run or pass play. So
7 it was live events tied to an online experience.
8 My role was to understand the delay loss and
9 jitter characteristics of the wireless communication and
10 whether or not you could effectively req- -- effectively
11 have a system that would have people try and guess what
12 was going to happen before a live event.
13 Q What happened to the company?
14 A I suspect it didn't go anywhere. I don't recall
15 that they were ever successful enough to be acquired at
16 any meaningful acquisition price.
17 Q We talked a little bit about -- well, I don't
18 know.
19 Did Ms. Rollins ever complete her Ph.D.?
20 A She did.
21 Q So we talked a little bit about Dr. Rollins's
22 publications with you regarding the interactive classroom?
23 A Digital classroom.
24 Q Digital classroom.
25 Are there other Ph.D. students that you were

1 involved with that had a driver focus in their research?
2 A So one was Hang Jin Zhang, Z-h- --
3 Q I think you've got a list in the back.
4 A Yeah, I do.
5 I think he was actually a masters student. Let
6 me find it.
7 MR. YANG: I thought you did. It was at the
8 beginning.
9 THE WITNESS: Maybe he -- no. Actually, I think
10 he never finished his Ph.D. That's why. He also worked
11 in the digital classroom.
12 You asked about completed students. Two other
13 students were Hang Jin Zhang, H-a-n-g, J-i-n, and the last
14 name Z-h-a-n-g. He did work in the digital classroom as
15 well.
16 And then another student initially started
17 working in the classroom and then switched, and he was the
18 last student Daniel Havey, H-a-v-e-y. His was more an
19 application in the classroom. So his papers were things
20 like how to do automated captioning. So we wanted to take
21 the audio and turn it into text so that students could
22 search for things like "When did Almeroth say this was
23 going to be on the exam?" And then they could link up the
24 PowerPoint for the class with the audio and video.
25 So he used the classroom infrastructure,

1 obviously, sending data, analyzing data. I'm not sure
2 that that would be driver centric in terms of a Ph.D., but
3 he was pretty heavily involved in using drivers and
4 network communication in his Ph.D.
5 BY MR. HALVERSON:
6 Q Were any of those three writing drivers?
7 A Yes. All -- all of them would have been writing
8 drivers in some -- most of the environments, they were
9 developing pretty sophisticated applications. And so
10 writing their own drivers and then, I suspect, in -- in
11 other instances less related to their specific research
12 where they were using things like USB, as what I call a
13 "commodity," meaning an existing tool for which they
14 weren't focusing their innovation on.
15 MR. HALVERSON: Now pending anything from
16 Mr. Yang, I think I've got everything I need.
17 MR. YANG: I do not have any further questions.
18 MR. HALVERSON: Great.
19 THE STENOGRAPHER: Off the record at 2:09 p.m.
20 (Time noted 2:09 p.m.)
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23 ---o0o---
24
25

1)
2 STATE OF CALIFORNIA)
3)
4 CERTIFICATE OF REPORTER
5 I, JUSTYNE N. JOHNSON, do hereby certify that the
6 witness in the foregoing deposition was by me duly
7 affirmed to tell the truth, the whole truth and nothing
8 but the truth in the within-entitled cause; that said
9 deposition was taken at the time and place therein stated;
10 that the testimony of said witness was reported by me and
11 was thereafter transcribed under my direction and
12 supervision; that the foregoing is a full, complete and
13 true record of said testimony; that the witness was given
14 an opportunity to read and, if necessary, correct said
15 deposition and to subscribe the same.
16 I further certify that I am not of counsel or
17 attorney for any of the parties in the foregoing
18 deposition and caption named, or in any way interested in
19 the outcome of the cause named in said caption.
20 IN WITNESS WHEREOF, I have hereunto set my hand
21 this 30th day of June, 2025.
22
Justyne Johnson
23
24 _____
25 JUSTYNE N. JOHNSON, CSR NO. 14301

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