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U.S. PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TEXAS INSTRUMENTS)
INCORPORATED,)
)
Petitioner,)
) Case IPR2024-00935
vs.) Patent 7,865,177
)
) Case IPR2024-00936
PARKERVISION, INC.,) Patent 9,118,528
)
Patent Owner.) Ref. 12189-0091IP1
) 12189-0091IP2

DEPOSITION OF

DAVID RICKETTS

VIA VIDEOCONFERENCE

JUNE 13, 2025

Reported by:
LINDSAY JAGICH,
CSR NO. 13889
JOB NO. J12993711

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PARKERVISION, INC.,) Patent 9,118,528
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Patent Owner.) Ref. 12189-0091IP1
) 12189-0091IP2

DEPOSITION OF DAVID RICKETTS, a
witness herein, taken on behalf of the
Petitioner VIA VIDEOCONFERENCE, at 6:05
a.m. Pacific Time, on Friday,
June 13, 2025, before Lindsay N. Jagich,
CSR No. 13889.

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I N D E X

EXAMINATION BY:

PAGE

MR. MAGEE

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E X H I B I T S

(NONE)

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Proceedings Held Remotely Via Videoconference

Friday, June 13, 2025

-o0o-

THE REPORTER: Good morning. My name is Lindsay Jagich, CSR Number 13889.

Dr. Ricketts, would you please raise your right hand to be sworn.

///

DAVID RICKETTS,
a witness herein, having been sworn, was examined and testified as follows:

THE WITNESS: I do.

THE REPORTER: Thank you.

///

-EXAMINATION-

BY MR. MAGEE:

Q Great. Good morning, Dr. Ricketts. I'm Robert Magee.

You understand you're here to testify regarding your declarations in IPR2024-00935 regarding U.S. Patent No. 7,865,177?

A I understand, yes.

Q Okay. And you also understand that you're here today to testify about your declaration in IPR2024-00936

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1 regarding U.S. Patent No. 9,118,528; correct?

2 A Yes, that's correct.

3 Q Okay. Great.

4 Have you ever been deposed before?

5 A I have.

6 Q Okay. So I'm sure you're familiar with the
7 rules generally.

8 If at any point you need a break, just let me
9 know. The only thing I would ask, that we finish the
10 question that is currently pending before we take a
11 break.

12 A Understood.

13 Q Okay. And there are a number of sections of
14 your declarations in these two IPR's that are
15 overlapping, for instance, like, the technical
16 background, where it's just word for word the same
17 sections. I obviously don't intend to repeat the same
18 questions across both IPR's, but if at any point you're
19 confused about which IPR proceeding we're talking about
20 or you need clarification, just go ahead and ask.

21 A Okay. I will be sure to ask.

22 So just for clarity, if you can confirm, your
23 intent is to ask questions about both IPR's in the same
24 session? We won't be doing one IPR and then opening up
25 the next IPR? You'll do them concurrently, and if I have

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1 any questions which IPR a question relates to, I should
2 ask or state my understanding?

3 Q Exactly. You know, since there are overlapping
4 topics and, like I say, paragraphs in your declarations
5 that are exactly the same between the two, I don't want
6 to waste your time any more than necessary. So --

7 A Okay. I understand.

8 Q Okay. And if anything else in my questions is
9 ever unclear, please ask for clarification. Otherwise
10 I'm going to assume that you understood the question.

11 Is that fair?

12 A I understand.

13 Q Okay. Great.

14 Can you tell us a little bit about your work
15 experience as it's relevant to these IPR's?

16 A I am a professor of electrical computer
17 engineering. I've been a professor since 2006, so
18 19 years, and I work generally in the integrated circuit
19 wireless systems, radios. I think we would call it
20 microwave and radiofrequency circuits, devices, and
21 systems.

22 Q Okay. And in your declarations, you also talk
23 about some of your work experience dating back to, I
24 believe, 1995.

25 Is all of that relevant to your testimony today?

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1 A Prior to -- so during my PhD, I worked on
2 microwave and radiofrequency circuits. Prior to my PhD,
3 I worked on integrated circuits. I did a master's on a
4 phase-locked loop, which is also used in radiofrequency
5 systems. So worked during my master's on integrated
6 circuits related to wireless systems.

7 So I would say yes, there's portions of that
8 which experience are relevant.

9 Q Okay. And perhaps I missed it.

10 Which work experience was working on microwave
11 and radiofrequency circuits?

12 A So I did my master's thesis on a phase-locked
13 loop. The master's thesis was done at Analog Devices,
14 and so that was part of a radiofrequency chip and system
15 that we were designing.

16 Q Okay. Anything else?

17 A No. Prior to '95, I was still in -- still doing
18 my bachelor's.

19 Q Okay. And have you ever testified in an IPR
20 proceeding before?

21 A I have.

22 Q Okay. How many approximately?

23 A I haven't counted them, but I would expect it
24 would be more than maybe 10.

25 Q Okay. Okay. Do you have any sort of training

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1 or expertise in analyzing U.S. patents?

2 A I have served as an expert on IPR's, ITC cases,
3 district court cases. Have been admitted as an expert on
4 those cases by multiple jurisdictions. So that's my
5 experience with regard to testifying as an expert.

6 I also have a few patents of my own, and I have
7 experience in the prosecution process of that.

8 But if you're asking for any other legal
9 qualifications, you'd have to ask more specifically. I'm
10 not sure that answered your question.

11 Q No, that's exactly right. I just want to make
12 sure that we captured it all, so that makes sense.

13 Okay. In your declarations you talk about some
14 general technology background. I believe you call it
15 "detailed technology background."

16 Do you recall that?

17 A Just a moment.

18 Q Sure.

19 And do you have access to your -- your
20 declarations today?

21 A I do. I downloaded all the files from the PTAB
22 website.

23 Q Okay. Do you also have access to the exhibits
24 in these matters?

25 A Yes. Counsel has provided for me the -- any

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1 confidential exhibits that I may have produced, and then
2 everything else would be on the -- the PTAB website.

3 Q Okay. So at any point -- I think you're
4 bringing up your declaration now.

5 At any point you need to refer to any of these
6 documents, that's fine. I would just ask that you please
7 let me know what document you're looking at so we can all
8 be on the same page.

9 A Okay. I see that in both the '935 and '936, I
10 have a detailed technology background. They do contain
11 different subjects. Looks like there's several that do
12 overlap, but there's also some differences.

13 Q Okay. That's fair. So I'm looking at your
14 declaration in the '935 matter, and if we go to the
15 section starting with paragraph 43, I believe that's
16 titled "Basic Circuit Concept."

17 I believe it's on page 19 of the PDF, if that's
18 helpful.

19 A I'm at page 43 of my '935 declaration.

20 Q Sorry. I think there might have been a
21 confusion there. It was paragraph 43. I believe that's
22 on page --

23 A I apologize. Paragraph 43 --

24 Q Yes.

25 A -- of the '935 declaration. Yes.

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1 Q And this is a section entitled "Basic Circuit
2 Concepts"; correct?

3 A That's the title of the Section A.

4 Q Okay. And just for clarity, in your declaration
5 in the '936 matter, you include the same section of
6 "Basic Circuit Concepts," I believe. Should start on the
7 same page with the same paragraph number.

8 A It appears to be a same or similar section
9 starting at, yeah, paragraph 43, in IPR '936.

10 Q Okay. For clarity let's just stay with the
11 declaration in the '935 matter. That way we're all on
12 the same one if there are any small differences.

13 A Sure.

14 Q Great.

15 So paragraph 44, you talk about charge.

16 Do you see that?

17 A I do.

18 Q Okay. And in that, you note that protons carry
19 a positive charge, and electrons carry negative charge;
20 is that correct?

21 A That is what's written in paragraph 44.

22 Q Okay. And then in 45, you say that the
23 operation of electrical circuits depends on the movement
24 of electrons, not protons; correct?

25 A That is correct.

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1 Q Okay. So in the electrical circuits that are
2 the subject matter of these IPR's, the charge carriers
3 we're talking about are the electrons; correct?

4 A The -- in the electrical circuits, where we've
5 got wires connecting device -- let me be clear. In the
6 electrical circuits where we're using metallic wires, the
7 conductor of the electricity is charge.

8 Q Uh-huh.

9 A And so that would be electrons.
10 In devices -- it's a little more complicated,
11 but in the wires interconnecting them, it would be just
12 electrons flowing.

13 Q Okay. And within, for instance, semiconductor
14 devices, so within the transistors of those, electrons
15 are the charge carriers there as well; correct?

16 A Typically in the field, we describe electrons
17 and holes, and so we model holes as a -- as a virtual
18 conducting element, and that's how we do our mathematical
19 basis. The hole's created from the absence of an
20 electron, so an electron is involved in both of those,
21 but generally it's holes or electrons are what we talk
22 about for, like, transistors.

23 Q Okay. And I'm a little rusty in this.

24 There's both NMOS and PMOS transistors; correct?

25 A That is correct. There's NMOS and PMOS. And

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1 the -- I'm sorry. The N and the P have to do with the
2 doping of the semiconductor.

3 Q Okay. And in an NMOS device, if I remember
4 correctly, the electrons are the charge carrier; is that
5 right?

6 A I would -- yeah, I believe that is correct for
7 the -- for the NMOS. I always have to look it up, a side
8 view diagram, to check that. But I think, yeah, the NMOS
9 are the electrons, and the P's are the holes.

10 Q Okay. And sorry. Just want to be clear, just
11 because you mentioned looking it up.

12 Are you accessing or looking at any other
13 documents outside of the materials in these matters?

14 A No, I was saying -- my best recollection is yes,
15 it's electrons. Normally I would just go pick up a
16 textbook and just verify it because after we teach it in
17 school, we tend to just use the devices as they are as
18 opposed to think back about the charge carriers.

19 Q Understood. I have the same challenges.
20 Definitely looking things up is helpful.

21 Okay. Looking at your declaration again,
22 paragraph 46, you're discussing voltage.

23 Do you see that?

24 A Paragraph 46 in the '935, yes.

25 Q Correct. Yes.

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1 And excuse me. In that, you say that negative
2 charges are naturally attracted to higher voltages. So
3 my understanding is electrons will naturally flow from a
4 lower voltage to a higher voltage; correct?

5 A Yes. They are attracted to positive charge, if
6 you will. So electrons, because of convention, tend to
7 flow in the opposite direction of what we call current.
8 But yes, the electrons go from negative to positive.

9 Q Okay. And in paragraph 47, you're talking about
10 electric current.

11 There we're talking about conventional current;
12 is that correct?

13 A Yes. To be -- so paragraph 47 talks about
14 current flow or movement within a circuit. So generally
15 when we talk about -- we'd have to look specifically, but
16 generally we talk in circuit analysis about current
17 flowing in one direction or the other direction.

18 Q Uh-huh. And if I recall correctly, when we talk
19 about current flow, that's the opposite of the direction
20 of the electron flow; correct?

21 A By convention, current flows from -- typically
22 from a positive to a negative, and the electrons are
23 actually traveling from the negative back up to the
24 positive, by just how we have defined those things in the
25 field.

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1 Q Okay. And then if we scroll down, you have a
2 section starting on paragraph 53 regarding circuit
3 components.

4 Can we scroll down to that.

5 A I'm at paragraph 53 of the '935.

6 Q Okay. And the first subsection of B is entitled
7 "Transistor."

8 Do you see that?

9 A I do see that above paragraph 41.

10 Q Okay. So I want to talk a little bit just about
11 your description of transistors, and specifically your
12 description of NMOS transistors, which starts on
13 paragraph 61 on page 18.

14 A Okay. Would you like to -- I'm at page 61 of
15 the '935, if that's where you'd like to start.

16 Q Sorry. Just to be clear, paragraph 61?

17 A Sorry. Paragraph 61 of the '935.

18 Q Great. Thank you.

19 So paragraph 61 is discussing NMOS transistors.

20 And I believe in this we were saying that the
21 electrons are the charge carriers; correct?

22 A The device shown there, when it goes into
23 inversion, you'll get electrons in the channel, and those
24 electrons will flow from the -- from the two ends of the
25 transistor --

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1 Q Okay.

2 A -- so from the drain down to the source.

3 Q Okay. So the -- as it's drawn here with the
4 voltage with the positive terminal on the drain, the
5 electrons will flow from the drain to the source; is that
6 right?

7 A Okay. We should be careful with the direction.
8 So the way it's drawn, the drain voltage, which is on the
9 right, is a high voltage; and we show drain current ID
10 going into the drain, so it's flowing from the drain to
11 the source.

12 The charge that's moving in the channel of the
13 device would be electrons. As we discussed before,
14 they're going to move from the lower potential to the
15 higher potential, so they'll move from the source to the
16 drain.

17 Q Okay. Got it.

18 So the ID there is the conventional current as
19 drawn; is that right?

20 A Yes, conventional current, yeah.

21 Q Okay. But in terms of the electrons themselves,
22 those are flowing from the source to the drain?

23 A That is -- that is correct.

24 Q Okay. Okay. And then I believe we have another
25 section, yes, starting on paragraph 69, which is page 22

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1 of your declaration in the '935 matter.

2 A I'm at paragraph 69 of the '935.

3 Q Okay. So this is a section talking about
4 resistors; correct?

5 A Correct.

6 Q Okay. Resistors are typically described in
7 terms of their resistance, which is measured in ohms;
8 correct?

9 A We quantify its resistance to current flow
10 with -- yes, with resistance, and it is units ohms.

11 Q The impedance of a resistor is the same as its
12 resistance; correct?

13 A For a resistor -- so "impedance" is the general
14 term.

15 Q Uh-huh.

16 A And so the impedance of a resistors by itself is
17 just resistance.

18 Q Okay. And just below that, starting in
19 paragraph 72, there is a section describing capacitors;
20 correct?

21 A Yes. Paragraph 72 of the '935 starts the
22 section of capacitance.

23 Q Okay. And you state "a capacitor is one type of
24 circuit element used to store or accumulate energy."

25 Can you just describe how a capacitor stores

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1 energy?

2 A So charge is put onto two pieces of metal that
3 oppose one another. So negative charge is put on one
4 side, positive charge on the other. The two attract each
5 other, and so they can't flow because a capacitor has a
6 barrier. And so you can put charge on both sides, and it
7 wants to flow, but it can't. And so the charge just
8 piles up onto the capacitor, and then you can release
9 that charge because it maintains its potential. And you
10 can release that charge then to an external circuit. And
11 the general relation is $Q=CV$, where Q is the charge, C is
12 the capacitance, and V is the voltage.

13 Q Okay. And so the energy -- I think you have a
14 section here -- the energy on it is measured in terms of
15 the voltage; is that right?

16 A Paragraph 76 of the '935 shows the energy is C
17 times the voltage squared --

18 Q Okay.

19 A -- divided by 2.

20 Q Okay. And does that matter whether a capacitor
21 is hooked up to either a voltage source or a current
22 source?

23 A So that is the fundamental equation for a
24 capacitor. So however you are using it in circuit, the
25 energy on it will be CV squared over 2. So you could

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1 refer to a circuit a number of ways, talk about currents,
2 talk about voltages. But the energy on the capacitor
3 will be related to the voltage on the capacitor.

4 Q Okay. And so if a capacitor is hooked up to an
5 ideal current source, how would you determine the energy
6 stored on that capacitor?

7 A I think that's one of the examples we teach in
8 our introductory classes, so if you put a -- a constant
9 current source into a capacitor, $I = CDV/DT$ is the
10 differential equation, so I is constant, so the voltage
11 on the capacitor would just increase linearly over time
12 until you either broke the capacitor or you turned off
13 the current source.

14 Q Okay. Got it. Okay.

15 And capacitance is measured in farads; correct?

16 A Correct, farads.

17 Q Okay. How do you determine the impedance of a
18 capacitor?

19 A In wireless systems, we use that differential
20 equation, $I = CDV/DT$. We calculate an impedance at a
21 specific frequency. And so I believe for capacitor, it's
22 $1 \text{ over } j \omega$, where -- C -- sorry -- $1 \text{ over } j \omega C$,
23 where ω is 2π times the frequency, and C is the
24 capacitance.

25 Q And sorry. What's j ?

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1 A J is the engineer's notation for imaginary.

2 Q Okay.

3 A And typically imaginary is something that's
4 90 degrees out of phase, but from a mathematical
5 standpoint, it has to do with the phase and the current
6 are not in phase with one another, and that's why we have
7 an imaginary component.

8 Q Okay. And you use J because I is otherwise used
9 for current?

10 A No. The physicists use I; the mathematicians,
11 for some reason, you can use either I or J. The
12 electrical engineers like to use J, so that's just what
13 we've gotten used to. And maybe it is for the reason you
14 say, but I don't -- I don't know that that's agreed on by
15 all.

16 Q Fair enough.

17 Okay. And then I'm going to jump down just a --
18 a bit further, down to paragraph 122. This is the
19 section entitled "Sampling."

20 A I'm at paragraph 122 in the '935.

21 Q Okay. And this may not be the right section.
22 This is just where I was looking.

23 In this section you talk about aliasing, and one
24 of the issues that's come up in this matter is an
25 aliasing rate.

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1 And so I was -- what is an aliasing rate?

2 A Just a moment.

3 Do you have a -- there we go.

4 So we're -- in reference to the '935 IPR, which
5 is on the '177, I believe the patent says "when a signal
6 is sampled at less than or equal to twice the frequency
7 of the signal, the signal is said to be undersampled or
8 aliased."

9 Q Okay. So is it your understanding an aliasing
10 rate is a rate that is less than or equal to twice the
11 frequency of the signal?

12 A That's my understanding.

13 Q Okay. So aliasing rate isn't talking about the
14 duty cycle of the signal at all; it's talking about the
15 frequency?

16 A That is correct.

17 Q Okay. Okay. And just to be clear, a second ago
18 were you looking at the '177 patent?

19 A Yes, as we were speaking of the '935 IPR, it's
20 in Section 2, "Overview of the Invention."

21 Q You wouldn't happen to have a page number or
22 column number for that, would you?

23 A Just a moment. I think, as you know, these
24 patents are very large --

25 Q Yes, they are.

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1 A -- and so I -- I have the patent office copy up
2 because it's sometimes easier to work with.

3 So just a moment, and I will find it.

4 I'm sorry. I'm having just a little bit of
5 difficulty.

6 Here we are. So column 26, starting on line, I
7 think, 12 is the paragraph. And the citation I had, I
8 think we would say is line 16 to -- to -- we'll just say
9 16 to 21.

10 Q I see. Okay.

11 And the copy of the '177 patent you have has
12 column numbers where I can refer to a column number and
13 line number to direct you; is that correct?

14 A Yes, sir.

15 Q Okay. Great.

16 So for the '177 patents, the claims refer to a
17 matched filtering/correlating module; correct?

18 A Claim 14, Element 14.1, is receiving an input
19 signal at a first match filtering/correlating module.

20 Q Okay. And if I can direct you to Figures 148
21 and 149 of the '177 patent. I believe they are on page
22 198 of the PDF, if that's helpful.

23 A Just a moment, please.

24 Q Uh-huh.

25 A I'm in the patent at 148, the '177 patent, 148,

1 Figure 148, Figure 148.

2 Q Figure 148.

3 So Figure 148 is a flowchart describing the
4 method; correct?

5 A Yes, it's a method for down-converting
6 electronic signal.

7 Q Okay. And can you also see Figure 149?

8 I believe they're on the same page of the
9 patent.

10 A I do see Figure 149.

11 Q Okay. And do you understand that Figure 148 is
12 describing the operation of Figure 149; correct?

13 A Figure 149 illustrates an example, Gated Matched
14 Filtering Correlated System 14900, which can be used to
15 implement the Method 14800, which is in 148.

16 Q Okay. And is it also your understanding that
17 this is one embodiment of the matched
18 filtering/correlating modules of Claim 14?

19 A Figures 149, 150, 153, are different
20 embodiments. So 149, as the patent states, is an example
21 of a matched filter correlating system.

22 Q Okay. So this is one example of a matched
23 filtering -- matched filtering correlating system; is
24 that correct?

25 A Correct, yes.

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1 Q And I guess we can scroll to the next page.

2 Figures 150 and 151 are a second embodiment of a
3 matched filtering correlating system; is that correct?

4 A So 151 illustrates an example of a Finite Time
5 Integrating System 15100, which can be used to implement
6 Method 15000, which is Figure 150. And this is using a
7 finite time integration system.

8 Q Okay.

9 A Go ahead.

10 Q I didn't mean to interrupt.

11 A And Figure 153 is going to be an example of an
12 RC Processing System 15300, which can be used to
13 implement Method 15200, which is in Figure 152. And this
14 is an RC processing operation.

15 Q Okay. I just want to be a little bit clearer.

16 For Figure 151, which I believe you said
17 illustrates an example of a finite time integrating
18 system -- that is one embodiment of a matched filtering
19 correlating system; correct?

20 A That is an embodiment.

21 Q Okay. And Figure 153, which you described as an
22 RC processing system -- that is also an embodiment of a
23 matched filtering correlating system; correct?

24 A Yes.

25 Q Okay.

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1 A I just -- just to -- to clarify, we -- I have
2 several -- we have claim constructions for these. So I
3 think if we want to go over, you know, specifically the
4 claims, we -- we need to look at the claim construction.

5 But these are generally different ways to do the
6 integration because a complete integration is not
7 typically practical. So there's a finite time, and
8 there's an RC.

9 Q Okay. Understood.

10 And then I believe the patents at figures -- so
11 if we can go down to Figure 171, I believe it's on page
12 209 of the patent.

13 A I am there.

14 Q Okay. This is, I believe, the same embodiment
15 as Figure 149; is that correct?

16 A Looking at Figure 171 of the '177 patent, and
17 looking at a copy in my declaration of the '935 on Figure
18 149, they look to be substantially the same. That's not
19 labeled with the same numbers, but it does look to be
20 substantially the same.

21 Q Okay. And if we could just go down to Figure
22 173.

23 Figure --

24 A I -- yeah. I'm at 173 of the '177.

25 Q I apologize. Don't mean to interrupt you.

1 Figure 173 is substantially the same as Figure
2 153, the embodiment in Figure 153; correct?

3 A Looking at the two, I -- once again, 173 doesn't
4 have the same labels, but they look substantially --
5 substantially the same.

6 Q Okay. Sorry to take you back and forth.

7 If we could go back to Figure 153.

8 A I'm back at 153 in the '177 patent.

9 Q Okay. So in Figure 153, what is $S_i(t)$ on the
10 left side of the Figure?

11 A Sorry. S_i is defined in the '177 as the received
12 carrier signal.

13 Q Okay. Is there a specific section of the -- the
14 specification you're looking at, just so we can be on the
15 same page?

16 A Yes. This is going to be -- Figure 153 is
17 described in Section 1.3, a high-level of description of
18 the RC processing. And it's a bit confusing in the
19 patent because it has sections, so let me just find that
20 section.

21 So let's see.

22 I'll find it.

23 But it's Section 4 on mathematical descriptions
24 of the present invention, and then Section 1.3 of --
25 sorry. This -- 1.3 of Section 4 discusses 153, and I

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1 think that is going to start column 133, line 41.

2 Q Okay. Yes. 133, line 41.

3 And then if I'm looking correctly, column 134,
4 around line 31, is the beginning of the description of --

5 A SI --

6 Q Sorry --

7 A Not -- so 133, line 31 says "received carrier
8 signal Si.

9 Q Oh, yes, I see that. Okay.

10 That's in terms of Figure 151, I believe; is
11 that correct?

12 A That's -- that's -- the citation we just gave is
13 for Figure 151.

14 Q If it's helpful, I think the description of 153
15 starts in the following column, on column 134, line 31.
16 And I think it describes the Si and (t) around line --

17 A Thank you. Column 134, line 40 has received
18 carrier signal Si.

19 Q Okay. Got it.

20 And you'll have to forgive me. I have to flip
21 back and forth between the figures and the columns.

22 So in this Figure 15302 is a source resistance;
23 correct?

24 A 15302 is labeled as a source resistance in the
25 '177.

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1 Q Okay. And 15306 is a capacitor; is that right?

2 A 15306 is a capacitor.

3 Q Okay. And then $S_0(t)$ is the result of the -- the
4 module; correct?

5 A The -- yes, the result of the RC processor is
6 S_0 -- $S_0(t)$.

7 Q Okay. And in this circuit, the result is the
8 down-converted signal; correct?

9 A So the energy is -- and I'm looking at the claim
10 construction of the '935.

11 The energy is integrated and then transferred to
12 a load to form a down-converted signal.

13 So the energy that comes out and is transferred
14 to the load would form the down-converted signal.

15 Q Okay. But in -- in the embodiment in the
16 patent -- my question was more what is $S_0(t)$.

17 A I think it says Capacitor 15306 integrates the
18 output of the Switching Module 15304, accumulates the
19 energy of the processed portions on the received carrier
20 signal, and then RC Processor 15300 passes on the result
21 to subsequent circuitry. So that is the capacitor that
22 just integrated is passing on the result through the node
23 labeled $S_0(t)$.

24 Q Okay. But -- and is $S_0(t)$ the down-converted
25 signal?

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1 A I think, once again, looking at the '935 IPR,
2 the down-converted signal is formed from the energy
3 transferred to a load. So that picture doesn't have the
4 load where the energy is transferred to form the signal.

5 Q Okay. If we look up to Figure 153, that's the
6 flowchart of the method for the operation of the RC
7 circuit in Figure 153; correct?

8 A I apologize. I just needed to reorient myself.
9 Figure 152 -- is that what you wanted to look
10 at?

11 Q Correct, Figure 152.

12 A I'm there at Figure 152.

13 Q Okay. That is an example method for
14 down-converting an electromagnetic signal using the RC
15 processing system of Figure 153; correct?

16 A Just a moment.

17 Figure 152 illustrates an example for
18 down-converting an electromagnetic signal using a matched
19 filter correlating operation.

20 That is correct. That's in '177.

21 Q Okay. And if we look down at column 134, lines
22 31 to 32, the patent states that Figure 153 is an RC
23 processing system that can be used to implement method
24 15200; correct?

25 A It does say that the RC processing system 15300

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1 can be used to implement 15200.

2 Q Okay.

3 A Which is Figure 152.

4 Q Okay. So -- so we agree that the embodiment in
5 Figure 153 is at least one example of a system that can
6 implement the method described in 15200; correct?

7 MS. LEPORE: Objection. Form.

8 THE WITNESS: I think we -- we just for clarity,
9 in the patent, says 153 illustrates an example that can
10 be used for the Method 15200. So that's what the patent
11 says.

12 When we describe the down-converted signal, once
13 again, IPR '935, we have a construction that the
14 down-converted signal is -- let's see -- the energy from
15 the input is integrated and transformed to a load to form
16 the down-converted signal. So we would just have to add
17 the load for which the energy is transferred to, to
18 complete that.

19 BY MR. MAGEE:

20 Q So when you're describing a down-converted
21 signal in IPR '935, are you using that differently than
22 the down-converted signal in Figure 152?

23 MS. LEPORE: Objection. Form.

24 THE WITNESS: Well, 152 says "outputted
25 down-converted signal."

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1 And in my declaration for IPR '935, my
2 construction is the input signal is integrated and
3 transferred to a load to form a down-converted signal.
4 That was my plain and ordinary meaning.

5 And then if we look at the Florida district
6 court construction, it also has "or accumulated and
7 transferred to a load while the switch is closed and
8 discharged to a load when the switch is open."

9 So both those constructions have the
10 down-converted signal coming -- is formed from the energy
11 that's transferred. And Figure 152 -- I mean, it
12 discusses, you know, going through the method, and then
13 you've got a down-converted signal, and the constructions
14 explain what that down-converted signal should be
15 understood as. So it seems consistent with 152.

16 BY MR. MAGEE:

17 Q Okay. And Figure 152 more specifically says
18 "output a down-converted signal"; correct?

19 A Those are the words in the fourth box.

20 Q Okay. So it's your understanding that Figure
21 153 is outputting a down-converted signal; correct?

22 MS. LEPORE: Objection. Form.

23 THE WITNESS: Once again, the Figure 153, S0 is
24 the result of -- well, I'll just read it as it is to be
25 clear on the record.

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1 "Capacitor 15306 integrates the output of the
2 Switching Module 15304 and accumulates the energy of the
3 processed portions of the received carrier signal. RC
4 Processor 15300 also passes on the result to subsequent
5 circuitry."

6 So that's what 153 is. So S0 is the result of
7 the processing of the portions that I just mentioned.
8 And as I said in the '935 declaration, I have two
9 constructions that I analyzed, and both constructions
10 form a down-converted signal from the energy transferred
11 to a load. So the energy would come out of the capacitor
12 and flow into a load, and that would form the
13 down-converted signal.

14 BY MR. MAGEE:

15 Q Okay. So under your construction, the
16 down-converted signal doesn't exist until we get to the
17 load following the capacitor; is that right?

18 MS. LEPORE: Objection. Form.

19 THE WITNESS: I mean, the -- I guess the
20 construction says it itself. Circuitry that samples an
21 input signal at an aliasing rate using a switch such that
22 the energy of the input signal is integrated and
23 transferred to a load to form a down-converted signal so
24 that energy when it's transformed to the -- apologize --
25 transferred to the load would then form the

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1 down-converted signal.

2 BY MR. MAGEE:

3 Q Okay. And in Figure 153, what's the load?

4 A I think we discussed that earlier, that S0 is the
5 output. And so in an energy transfer system, the load
6 typically would be connected to that output so the energy
7 can be transferred from the capacitor, 15306, to a load
8 to form --

9 (Interruption by the reporter)

10 THE WITNESS: To form a down-converted signal.

11 BY MR. MAGEE:

12 Q Okay. Sorry. I think my question was slightly
13 different.

14 My question is, in the specification of the '177
15 patent, what is the load that's identified for Figure
16 153?

17 A 153 contains three elements: 15302, which is
18 the source resistor; 15304, switching module; and then
19 the capacitance, 15306. Those are the three components
20 that are shown in Figure 153.

21 Q Okay. So Figure 153 doesn't include a load?

22 A It doesn't list the load in the Figure.

23 Q Okay. And does the specification describe the
24 load that's connected to it?

25 A Well, the specification describes at length

1 energy transfer systems. If there's a specific paragraph
2 you want to point me to and ask me if there's something
3 there, I'd be happy to.

4 Q So I think the description of embodiment in
5 Figure 153 starts in column 134, on line 31.

6 And I guess I was just asking, does that
7 embodiment include the description of any load that's
8 connected to it?

9 A So once again, you know, the patent is -- is
10 about energy transfer systems which transfer energy from
11 a storage element to a load.

12 If I think you're asking about Figure 153, I
13 think we went over the components that are in it. Those
14 are the only components that are in that Figure.

15 And if I look at 134, column 134, line 31
16 through 36, as I said, it describes the source
17 resistance, a switching module, and a capacitance.
18 That's all that's described in that paragraph.

19 Q Okay. So the description of the embodiment in
20 Figure 153 doesn't specify any type of load that's
21 connected to it; correct?

22 MS. LEPORE: Objection. Form.

23 THE WITNESS: I thought I may have answered your
24 question. Let me just state it again.

25 Column 134, lines 31 through 36, are describing

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1 the components in Figure 153; and the Figure 153 only has
2 the three components I mentioned: Source resistance,
3 switching module, and capacitance.

4 And the column -- sorry -- column 134, lines 31
5 through 36, do not list any other components but those
6 three in describing -- in that part describing 153.

7 BY MR. MAGEE:

8 Q Okay. And you're not interpreting Figure 153 as
9 including any other components, are you?

10 A 153 is an embodiment, is an example of an RC
11 processing system. So that's what I'm understanding 153
12 as. I'm understanding 153 in the figure to contain those
13 three components: Source resistor, switching module, and
14 capacitance. But in the context of the claim and the
15 claim construction, I understand that the energy that is
16 transferred to the capacitor is then transferred to a
17 load to form the down-converted signal.

18 Q Okay. And that's -- that step you just
19 described -- that's not described in -- in the method of
20 152, Figure 152 -- let me just ask that again. Sorry.

21 The step you just described of transferring
22 energy to a load to form the down-converted signal --
23 that's not a step described in Figure 152, is it?

24 MS. LEPORE: Objection. Form.

25 THE WITNESS: Well, 152 is a method for

1 down-converting an electronic signal, perform an RC
2 processing operation on a portion of the carrier signal,
3 cumulate the result of the RC processing operation, and
4 then there's an arrow for outputting a down-converted
5 signal.

6 And I just want to be specific here. Figure 153
7 is an example of an RC processing system. So I see in
8 Step 15210, we've got an RC processing operation,
9 cumulating the result of that operation, and then there's
10 an arrow saying "all right," and that leads to the output
11 of a down-converted signal. And as I mentioned before,
12 that would be, in the construction in the '935
13 declaration, would be transferred to a load to form a
14 down-converted signal.

15 BY MR. MAGEE:

16 Q Okay. So your understanding is "output a
17 down-converted signal" is the same as "transferred to a
18 load to form a down-converted signal"; is that correct?

19 A My understanding from the construction is that
20 the energy is transferred to a load to form a
21 down-converted signal. I understand from 153 how a --
22 the example RC processing system works, and we can walk
23 through 152, but it does the RC processing operation on a
24 portion of the carrier signal; cumulate, which is
25 integrate the result of that; and then it says "output a

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1 down-converted signal."

2 And the construction I understand is -- to do
3 that, you transfer the energy from the capacitor to a
4 load to form the down-converted signal. So I think
5 that's consistent with, you know, the end part is to
6 produce an output of a down-converted signal.

7 MS. LEPORE: Counsel, we've been going for an
8 hour.

9 Is now a good time to take a break?

10 MR. MAGEE: Sure. Now is fine.

11 THE WITNESS: Five minutes?

12 MR. MAGEE: Five minutes is fine with me. Yep.

13 THE WITNESS: Thank you.

14 (Recess)

15 BY MR. MAGEE:

16 Q Dr. Ricketts, thank you for returning.

17 Did you talk to anyone during your break?

18 A I spoke briefly with counsel.

19 Q Okay. Did you discuss the substance of your
20 testimony?

21 A I did not.

22 Q Okay. If we can go to Figure 68G of the '177
23 patent.

24 Dr. Ricketts, just let me know when you get
25 there.

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1 A I just want to confirm, Figure 68G; correct?

2 Q Yes, of the '177 patent.

3 A Of the '177. Just a moment.

4 Q Sorry. You there? Or --

5 A Just a moment. I was just having a little
6 difficulty with the PDF.

7 Q Okay. I believe it is on page 98 of the PDF, if
8 that's helpful.

9 A I'm there at Figure 68G.

10 Q Okay. And this is one of the embodiments of the
11 invention; correct?

12 A In general, Figure 68G is an embodiment in the
13 '177 patent.

14 Q Okay. And looking at 68G, we have the switching
15 model -- excuse me. Scratch that.

16 In Figure 68G, on left side of the figure, we
17 have the switch module; correct?

18 A 68 has a -- a switch labeled "switch module."

19 Q Okay. And the input to that switch is the EM
20 Signal 1304; is that right?

21 A 1304 is an EM signal at the input to 6818, and
22 6818 is a gate transfer system.

23 Q Okay. And that's connected inside the gate
24 transfer system to the switch module; correct?

25 A The EM Signal 1304 is connected with a line to

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1 the left part of the switch module.

2 Q Okay. And it's your understanding that it's
3 being switched by the switch module; correct?

4 A The Energy Transfer Signal 6806 is turning on
5 the switch module, so that's closing the switch and
6 opening the switch. I do understand that.

7 Q Okay. And this is an energy transfer system;
8 correct?

9 A So Figure 68G is an integrated gate transfer
10 system, 6818, and the patent lists it under the general
11 heading of the energy transfer system as a gated transfer
12 system. So yes, this would fall under the energy
13 transfer -- transfer system as described in the patent.

14 Q Okay. And following the switch module on the
15 right side of the figure, there's a section labeled
16 "Storage Module."

17 Do you see that?

18 A I do see the storage module. It's -- to be
19 clear, doesn't have a number, but there's a rectangle
20 around a capacitor, calling it a storage module.

21 Q Okay. And it is your understanding that
22 capacitor can serve as an energy storage -- modular
23 energy storage element; correct?

24 A Yes, sir. A capacitor can be a -- store energy.

25 Q Okay. But that's also true inside an energy

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1 transfer system, that a capacitor can be used as the
2 energy storage element; is that right?

3 A A capacitor can be used as a capacitive energy
4 storage element.

5 Q And just to be clear, it can be used as a
6 capacitive energy storage element in an energy transfer
7 system; correct? There's nothing about an energy
8 transfer system that precludes the use of a capacitor?

9 A I'm sorry if I wasn't clear.

10 MS. LEPORE: Objection. Form.

11 THE WITNESS: A capacitor can be used as a
12 capacitive energy storage module in an energy transfer
13 system.

14 BY MR. MAGEE:

15 Q Okay. And at what's labeled, I believe, 1308B,
16 there's the down-converted signal at the terminal of the
17 capacitor; correct?

18 A 130B is labeled as down-converted signal.

19 Q Okay. And that's being illustrated at the --
20 one of the -- the node that includes one of the terminals
21 of the capacitor; correct?

22 A The -- I'm sorry. Could you ask the question
23 just so I could have it fresh.

24 Q Sure. Maybe I can rephrase it slightly.

25 Down-converted signal 1308B is illustrated as

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1 being connected to one of the terminals of the capacitor;
2 correct?

3 A 1308B is connected from a line from the right to
4 the top node of the capacitor that's shown in Figure 68G
5 of the '177.

6 Q Okay. And there's no load depicted in Figure
7 68G; correct?

8 A I -- could you ask your question maybe more
9 specifically for 68G?

10 Q There is no load depicted in Figure 68G;
11 correct?

12 A There -- the word "load" does not appear in the
13 Figure 68G. It does show the down-converted signal
14 130 -- 1308B, which I understand is where nonnegligible
15 amount of energy is transferred from the EM signal to
16 form the down-converted signal. So I'm assuming the load
17 would be in that portion.

18 Q What is "a nonnegligible amount of energy"?

19 A So with regard to the '935, there's no
20 construction, I believe, for that term.

21 Q Okay. How much energy needs to be transferred
22 to a load in order to down-convert the signal?

23 A Maybe I can answer it best this way.

24 With respect to IPR '936, Claim 1 discusses a
25 portion of energy that is distinguishable from noise as

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1 transferred. And certainly if you can't distinguish it
2 from noise, it would be a negligible energy.

3 Q Okay. So you need to transfer sufficient energy
4 to distinguish it from noise; is that correct?

5 A That's -- Claim 1 of the '528 has that as an
6 example.

7 Q Okay. So for the '935 IPR, which addresses the
8 '177 patent, I believe your construction of matched
9 filtering correlating module requires, at least in part,
10 that energy of the input signal is integrated and
11 transferred to a load to form a down-converted signal; is
12 that correct?

13 A I -- in my -- just a moment.

14 Circuitry that samples an input signal at an --
15 (Interruption by the reporter)

16 THE WITNESS: Sure. Sorry.

17 IPR '935, paragraph 196, "circuitry that samples
18 an input signal at an aliasing rate using a switch such
19 that the energy of the input signal is integrated and
20 transferred to a load to form a down-converted signal."

21 I am -- I think that's where you were just
22 asking about.

23 BY MR. MAGEE:

24 Q Yes.

25 And that's your proposed construction for

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1 matched filtering correlating module; correct?

2 A Yes, that is my proposed construction.

3 Q Okay. How much energy of the input signal must
4 be transferred to a load?

5 MS. LEPORE: Objection. Form.

6 THE WITNESS: Before, I believe we were talking
7 a nonnegligible amount of energy would need be
8 transferred to the load.

9 BY MR. MAGEE:

10 Q Okay. And a nonnegligible amount is an amount
11 that can be distinguished from noise; is that correct?

12 A That's one example, yes.

13 Q Is that your understanding of "nonnegligible
14 amount of energy" in your answer?

15 A Certainly you would have to transfer sufficient
16 energy to the load so that it was distinguishable from
17 noise, so the signal -- a nonnegligible signal would be
18 distinguishable from noise.

19 Q Okay. So I just want to make sure I have this
20 correct.

21 In your construction you would have to transmit
22 sufficient energy to the load so that it was
23 distinguishable from noise; is that correct?

24 A I may have misheard or misunderstood your
25 question. So my construction is -- last half is using a

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1 switch such that energy from the input signal is
2 integrated and transferred to a load to form a
3 down-converted signal, period. That's the end of the
4 construction.

5 And then I think you were asking me questions
6 about not those words, but other words, "nonnegligible
7 energy," etc., and I was trying to answer those with
8 respect to the IPR '935. And I said a nonnegligible
9 signal would be above noise --

10 Q Okay.

11 A -- distinguishable from noise.

12 Q Perhaps my question was unclear. I -- I'll take
13 ownership over that.

14 For the -- your construction in the '935 IPR, in
15 paragraph 196, how much energy of the input signal must
16 be transferred to a load?

17 A The construction or the words that are there, I
18 think perhaps you're asking the question, "Okay. In
19 general how much energy does the system need?" And a
20 system would need to form a down-converted signal a
21 nonnegligible amount of energy.

22 And it would certainly need to be -- a
23 nonnegligible amount of energy would be an energy above
24 the noise floor or above the noise in the -- the system
25 or whatever you're considering.

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1 Q Okay. So in your construction, circuitry that
2 samples an input signal at an aliasing rate using a
3 switch that transfers an amount of energy above the noise
4 floor of the system to a load to form a down-converted
5 signal would satisfy your construction; correct?

6 A For the record, I guess I just want to have a
7 little bit of clarity here. I have, in my declaration,
8 two constructions. One is in paragraph 196, and then I
9 also refer to the Florida district court.

10 So I believe your previous questions were all
11 not discussing the Florida district court, but were
12 discussing the 196. And you then asked a question that
13 used words that are not in the construction, so I think
14 you were asking would an embodiment that did XYZ meet
15 that construction.

16 That's why I'm getting a little confused. Just
17 want to make sure we're just talking about 196. And so
18 when you -- yeah. Maybe I just ask you to restate with
19 respect to 196 what was your question again. I
20 apologize.

21 Q Sure.

22 So in your construction as set forth in
23 paragraph 196 of your declaration in the '935 IPR,
24 circuitry that samples an input signal at an aliasing
25 rate using a switch that transfers an amount of energy

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1 above the noise floor of the system to a load to form a
2 down-converted signal would satisfy your construction;
3 correct?

4 MS. LEPORE: Objection. Form.

5 THE WITNESS: So I have a circuit that samples
6 an input signal at an aliasing rate using a switch such
7 that the energy of the input signal is integrated and
8 transferred to a load to form a down-converted signal.

9 I have a system that does that, so it -- it
10 meets the claim limitation by the -- the construction.

11 And if that energy that was transferred was
12 nonnegligible, for example, above noise, would that
13 system still meet that claim construction? Yes, it would
14 still meet that claim construction.

15 BY MR. MAGEE:

16 Q Okay. If you had that same system and it
17 transferred energy below noise, would that system still
18 meet the claim construction?

19 A We'd have to look at a specific example, but you
20 need to be able to form a down-converted signal. But I'd
21 have to look at a specific system to kind of understand
22 what was meant, what it is.

23 Q If you had a system with circuitry that samples
24 an input signal at an aliasing rate using a switch such
25 that energy of the input signal is integrated and

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1 transferred to a load to form a down-converted signal,
2 and that system did indeed form a down-converted signal,
3 does that satisfy your limitation?

4 A Well, having a system that the energy of the
5 input signal is integrated or transferred to a load to
6 form a down-converted signal, yes, that would by
7 definition meet the construction.

8 Q Okay. Is there any way to determine if a system
9 meets your construction other than to determine if it
10 down-converts a signal or not?

11 MS. LEPORE: Objection. Form.

12 THE WITNESS: Well, I mean, I'm not a lawyer,
13 but my understanding is I have a construction, and so you
14 would take a system that -- or an example that you think
15 meets this claim -- meets this construction, and you
16 would walk through it and check that it does everything
17 that is -- is in the construction. And forming a
18 down-converted signal is one of the pieces of the
19 construction.

20 So whatever hypothetical system, you go through
21 and check all the words, including forming a
22 down-converted signal.

23 BY MR. MAGEE:

24 Q So earlier you mentioned that there are two
25 constructions in your declaration: The construction set

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1 forth in paragraph 196, and the paragraph -- sorry --
2 the -- the construction from the Florida district court;
3 is that right?

4 A Just for clarity, paragraph 199 says that the
5 Florida district court previously construed -- and it
6 lists that rather long construction. And that's what I
7 list next. And that -- that construction is in my
8 declaration also.

9 Q Okay. So in paragraph 196, you set forth your
10 construction; and paragraph 199, you set forth the
11 Florida district court's construction; correct?

12 A 196 would be an understanding of the plain and
13 ordinary meaning, wherein the module samples an input
14 signal at an aliasing rate. So I'm in 196 stating what I
15 think a plain and ordinary -- how a POSITA would
16 understand it. And 199, there's a Florida district court
17 that also construed this term, and I list that
18 construction also.

19 Q Okay. And the construction you set forth in
20 paragraph 196 -- that's a construction that you created;
21 correct? Like, that's not from another source?

22 A The -- so my understanding is that I believe in
23 a Texas court, there was a plain and ordinary meaning
24 definition of "matched filtering/correlating module," and
25 I'm aware of that, and I'm providing what I believe a

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1 POSITA would understand as matched filtering/correlating
2 module, so plain and ordinary meaning of that.

3 Q Okay. So the paragraph in 196 is your
4 understanding of the plain and ordinary meaning of a
5 matched filtering/correlating module; is that correct?

6 A That's correct. I frame it as a POSITA would
7 understand the construction is. But the plain and
8 ordinary would come from the perspective of POSITA, so
9 that's why I phrased it that way.

10 Q Okay. And then in paragraph -- I just lost my
11 place there.

12 In paragraph 200 -- actually let's take a step
13 back.

14 Paragraph 199, you set forth the Florida
15 district court construction; is that right?

16 A Yes. I believe that's quoted in the first part
17 of the -- first part of the paragraph 199 of the '935
18 IPR.

19 Q Okay. And this construction has elements that
20 are not found in your construction; correct?

21 A It has --

22 MS. LEPORE: Objection. Form.

23 THE WITNESS: It's a much longer, more detailed
24 construction than the one that I have; however, I -- I
25 think that -- as I say in paragraph 200, the construction

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1 also captures the meaning of matched
2 filtering/correlating module.

3 BY MR. MAGEE:

4 Q Is it your understanding that this construction
5 is the same as yours?

6 A There are two different constructions. The
7 Florida court added additional constructions, additional
8 elements. Let me maybe -- maybe restart there.

9 The Florida court provided a construction of a
10 matched filtering/correlating module, and they listed
11 their construction, which included lots of details. The
12 overarching system that's described there is not
13 inconsistent with my construction. My construction is
14 just based on a -- what I would understand a POSITA would
15 understand from -- from the patent.

16 Q So the Florida construction includes details
17 that are not described in your construction; correct?

18 MS. LEPORE: Objection. Form.

19 THE WITNESS: The Florida construction is a much
20 longer construction and has more parts, so it has more
21 words than -- than are in my -- my construction as I
22 think a POSITA would see it. And that's definitely --
23 I'm sorry. That's just by definition. Having a much
24 longer construction is going to have more words that
25 aren't in the -- the construction in 196.

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1 BY MR. MAGEE:

2 Q I guess my question is slightly different.

3 Are the additional words in the Florida district
4 court required by your construction?

5 MS. LEPORE: Objection. Form.

6 THE WITNESS: I -- I think we'd have to look at
7 the specific words that you -- you want to ask about. I
8 don't think I can make a blanket statement.

9 BY MR. MAGEE:

10 Q Okay. Let's start at the beginning.

11 The Florida district court requires linear time
12 variant circuitry.

13 Do you see that?

14 A I do see that.

15 Q Does your construction require linear time
16 variant circuitry?

17 A Linear time variant circuitry is not -- it's not
18 in the construction. It's not inconsistent with the
19 construction, but it's not listed there.

20 Q Okay. Is it -- is it a sort of example of
21 something that would satisfy your construction?

22 A You could certainly build a system that would
23 satisfy the construction in 196 that was a linear time
24 variant circuit.

25 Q Okay. Do you have to use a linear time variant

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1 circuit?

2 A It's not in the construction. I think a POSITA
3 would understand that linearity and causal systems are
4 part of what's described in the specification of the
5 '177. So many of the descriptions, particularly
6 mathematical, would fall under a linear time and variant.

7 But those words do not appear in the
8 construction.

9 Q Okay. The Florida district court also requires
10 that the linear time variant circuitry sample a modulated
11 RF radiofrequency carrier signal.

12 Do you see that?

13 A I do see that.

14 Q Okay. Does your construction require a sampling
15 a modulated RF radiofrequency carrier signal?

16 A It requires sampling an input signal.
17 Radiofrequency -- a modulated radiofrequency carrier
18 signal would be an example of an input signal.

19 Q Okay. So sampling a modulated RF radiofrequency
20 carrier signal is narrower than your construction; is
21 that right?

22 A I would say yes.

23 Q Okay. It specifically -- let me take a step
24 back.

25 The Florida district court construction

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1 specifically requires using a switch with an independent
2 control input.

3 Do you see that?

4 A Just a moment.

5 I do see that.

6 Q Okay. Does your construction require using a
7 switch with an independent control input?

8 A The construction in 196 requires a switch to
9 sample at an aliasing rate an input -- a third terminal
10 input -- I'm sorry. Let me just go back to here.

11 An independent control input would be an example
12 of -- of how to -- how to do that.

13 Q Okay. So an independent control input is one
14 example of how you might implement your construction; is
15 that right?

16 A It is one way to implement it.

17 Q You're a person of ordinary skill in the art;
18 right?

19 A I was at the time of the -- the patents.

20 Q Okay. What is your understanding of an
21 independent control input?

22 A I think in -- just in general, talking about in
23 general, in the field, "independent" is not dependent on
24 another variable.

25 Q Okay. When you read the Florida district

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1 court's construction that describes using a switch with
2 an independent control input, what is your understanding
3 of "independent control input" there?

4 A That it has an independent control input, that
5 it is controlled by an independent input, like a switch
6 or a FET, as an example.

7 Q I'm sorry. I might have understood.

8 Are you saying that the switch is controlled by
9 a switch?

10 A I apologize. That may have been what I said,
11 but that was a misspeak. Let me see if I can clarify.

12 So the Florida district uses a switch with an
13 independent control input. So a POSITA would understand
14 that a switch has to be controlled. It's got at least
15 two states: On and off. And so we have to control the
16 on and off. And so the Florida district says that the
17 control of that switch is with an independent signal so
18 that that switch has an independent control, control
19 that's not dependent on other variables. Such I -- to be
20 specific, other variables such as the input or the output
21 of the switch.

22 Q Okay. I think you said a switch has at least
23 two states: On and off.

24 Can a switch have more than two states?

25 A What we're talking about, a -- a hypothetical

1 switch as an example. So switches have at least two
2 states: On and off. That's, I think, in a -- in the
3 general parlance of a switch, it would have an on and off
4 state.

5 Since we're not talking about a specific switch,
6 I -- you know, I wouldn't make a global statement. But
7 as we see, for instance, in several of the embodiments,
8 Figure 68G of the '177 we were just talking about, it has
9 a switch. And from the diagram I -- a POSITA would
10 understand that as having an on or off state. But one
11 might find a switch in a different context that might
12 have something else. But in the context of this, I think
13 it's pretty clear.

14 Q Okay. Sorry. I do want to be clear on this.

15 In an energy transfer system, is it your
16 position that a switch can only have two states?

17 A The specifications are -- are pretty clear.
18 They talk about when the switch is on and when the switch
19 is off. And so on and off are the two states.

20 Q Okay. And in real life, transistors are used to
21 implement switches; correct?

22 A Transistors --

23 MS. LEPORE: Objection. Form.

24 THE WITNESS: As an example, a MOSFET, like an
25 NFET, can be used as a switch.

1 BY MR. MAGEE:

2 Q Okay. And an NFET has a varying channel
3 connectivity, depending on the voltage that's applied to
4 the gate; correct?

5 A Not when being used as a -- as a switch; right?
6 The gate is low, switch is off. Gate is high, switch is
7 on, as a switch. A transistor can be used in other
8 function other than a switch, and there's other
9 functions. Yes, you can have the -- the transconductance
10 of the device varies as you vary the gate.

11 Q Okay. And even when a switch is off in an NFET,
12 there's still leakage current; correct? It's small, but
13 there's still some?

14 A I think in the context of a practical system,
15 there -- I mean, there's -- there's literally leakage to
16 ground, like -- like the really -- the earth. So, you
17 know, I think it's not an absolute 0 of no leakage in any
18 system.

19 But when the FET is off, it has negligible
20 current, orders of magnitude lower than it would have
21 when it is on. But once again, we have to look at a
22 specific scenario of the FET to see what that would be,
23 if any.

24 Q Okay. And even in a well-designed system,
25 there's some transition period between the on and off

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1 states; correct?

2 A I think a POSITA would understand that
3 nothing -- nothing changes instantaneously. So you would
4 go from on to off, and there would be a time duration of
5 that that was non -- non-0. It would be -- typically for
6 a switch, it would be pretty fast, but it wouldn't be 0.

7 Q In -- going back to the Florida district court
8 construction that's in paragraph 199, it refers to a
9 nonnegligible periodic aperture.

10 Do you see that?

11 A I do see that.

12 Q Okay. What is a nonnegligible periodic
13 aperture?

14 A Could you just repeat the question so I can make
15 sure I answer what was asked.

16 Q Sure.

17 In the Florida district court construction, in
18 paragraph 199, you can see it refers to a nonnegligible
19 periodic aperture; correct?

20 A I do see those words.

21 Q Okay. And my question is what is a
22 nonnegligible periodic aperture?

23 A So the '177, for instance, describes, for energy
24 transfer pulses have nonnegligible apertures, 4701, that
25 tend away from 0 time duration. And that's consistent

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1 with an energy transfer system transfers energy, and so
2 you need time to transfer energy.

3 Q How far away from 0 time duration do you have to
4 get for it to be a nonnegligible periodic aperture?

5 MS. LEPORE: Objection. Form.

6 THE WITNESS: You'd have to look at the
7 specific -- the specific circuit. An example of a
8 negligible aperture would be a delta function, which is
9 what we commonly use for the concept of voltage sampling.

10 So the '177 clearly is talking about tending
11 away from that 0 duration a delta function has. It's
12 mathematically more complex, but it's -- it's close to an
13 ideal 0 duration.

14 BY MR. MAGEE:

15 Q So you'd have to look at the specific circuit in
16 reference to understand whether or not an aperture is
17 nonnegligible; is that right?

18 A I think you were asking about numbers. So the
19 construction is a nonnegligible periodic aperture such
20 that samples having nonnegligible available energy are
21 accumulated and transferred to a load while the switch is
22 closed. So the switch would have to be closed for a
23 period of time that allows nonnegligible available energy
24 to be accumulated and transferred to the load when the
25 switch is closed.

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1 Q Is it true that any amount of time that allows a
2 nonnegligible amount of available energy to be
3 accumulated and transferred is a nonnegligible periodic
4 aperture?

5 MS. LEPORE: Objection. Form.

6 THE WITNESS: Once again, the -- the -- I mean,
7 the patent describes it as nonnegligible apertures are
8 apertures that trend away from 0 in time duration. And
9 in the context of energy transfer, you have to transfer
10 energy from the signal to the -- to the load and to the
11 storage element. So you'd have to be at an aperture that
12 allows that to happen.

13 BY MR. MAGEE:

14 Q I guess my question is, are all apertures that
15 allow that to happen nonnegligible?

16 A I -- in the construction, an aperture that
17 transfers energy to the load -- and the load here is a
18 low-impedence load -- to transfer energy to the load and
19 have a nonnegligible energy would meet this construction.

20 Q I am looking in the -- the construction in
21 paragraph 199.

22 Where in that construction does it require to be
23 a low-impedence load?

24 A I just want to go back, to follow up on the last
25 answer, and then if we can come back to here.

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1 The construction does talk about to produce a
2 down-converted signal with enhanced signal-to-noise power
3 ratio. So to have an enhanced signal-to-noise power,
4 you'd have to have power. Your energy transfer
5 couldn't -- would have to be well above the noise floor
6 in this example because you have to increase your
7 signal-to-noise ratio.

8 With respect to the load, I mean, described here
9 is energy is accumulated and transferred to the load when
10 the switch is closed and discharged through the load when
11 the switch is open, thereby transferring available real
12 power from the modulated RF carrier.

13 So if you had a very high-value resistor, 10
14 megaohms, you wouldn't be transferring real power from
15 the modulated signal. There would be almost no energy
16 moving into the load. So it's -- yeah.

17 Q Sorry. What's real power?

18 A When you have -- trying to think of the best way
19 to explain this.

20 When you have an inductor, for instance, and
21 you -- you can have current flowing in and out of an
22 inductor, and you can have voltage across it. But the
23 power isn't -- the power dissipation's not real because
24 of the phase relations of the voltage and current;
25 whereas if you have a current flowing through a resistor,

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1 the voltage and current are in phase, and so we call that
2 the real power.

3 So that's -- that's just it. It's the -- it's
4 just clarifying what a POSITA already knows, that we're
5 not talking about imaginary power that might flow in and
6 out of a reactive system.

7 Q Okay. So when we're talking about transferring
8 real power, we're talking about transferring it to a
9 resistive load; is that correct?

10 A Well, the -- the construction says "available
11 real power from the signal to the load." So we're
12 talking about, yes, the real power from the modulated
13 signal to the load. And I just use a resistor as an
14 example. If we looked at the power flowing into the
15 system, we'd have a real component of that power, and
16 that's the power that's being transferred to the load.

17 Q Okay. And what is "enhanced signal-to-noise
18 power ratio"?

19 A I think signal-to-noise ratio is a well -- a
20 well-known metric in the field.

21 And "enhanced" would be a -- a change to a
22 higher signal-to-noise ratio. That would be enhanced
23 from the convention that a higher signal-to-noise ratio
24 is considered better.

25 Q Sorry. A higher signal-to-noise ratio than

1 what?

2 A Than if you -- that was there before you've done
3 this process, or that's better than a reference point.

4 Oftentimes in industry we have a reference point
5 for signal-to-noise. So this is just saying that it
6 enhances, that by doing this -- by this -- by having the
7 circuit operate as the construction says, your
8 signal-to-noise ratio goes up.

9 Q Goes up from what?

10 A I think you'd have to look at a particular
11 system. So you might have a system that practices the
12 claims and produces a -- a higher -- let me put it this
13 way.

14 You could not sample with the appropriate phase
15 for a matched filter, for instance, and then you would
16 not have -- you could have a poor signal-to-noise ratio;
17 and then by practicing this, you could improve that
18 signal-to-noise ratio.

19 Q So in that example, are you comparing the same
20 circuit before and after? Or are you comparing an energy
21 transfer circuit to a different type of circuit?

22 MS. LEPORE: Objection. Form.

23 THE WITNESS: Sorry. Could you re-ask the
24 question? I just want to make sure I understand the
25 logic that was in it.

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1 BY MR. MAGEE:

2 Q Sure.

3 And you gave an example. You might have a
4 system that practices the claims and produces a higher --
5 sorry -- and then you said, "Let me put it this way. You
6 could not sample with the appropriate phase for a matched
7 filter, for instance, and then you would not have -- you
8 could have a poor signal-to-noise ratio. And then by
9 practicing this, you could improve that signal-to-noise
10 ratio."

11 So in your answer, are you comparing the same
12 circuit before and after to examine its signal-to-noise
13 ratio? Or are you comparing a different type of receive
14 circuitry to an energy transfer receive circuitry?

15 MS. LEPORE: Objection. Form.

16 THE WITNESS: Reading the construction as it is,
17 I think a POSITA would understand that the -- that by
18 doing this, you enhance the signal-to-noise ratio. So
19 you could compare two systems in the '551. For instance,
20 they actually walk through an example that shows how
21 signal-to-noise ratio is improved with, you know, energy
22 transfer, as an example.

23 And so I think this is just listing that you --
24 by doing this, you're able to show that your
25 signal-to-noise ratio is better than a baseline that you

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1 had before. It could be with circuits that's not
2 operating with this construction, and then does, and it
3 improves; or you could have a baseline that's out there
4 comparatively.

5 BY MR. MAGEE:

6 Q Okay. So if circuit otherwise met all the other
7 elements of the Florida district court construction but
8 produced a worse signal-to-noise ratio than a baseline,
9 it wouldn't meet the construction then?

10 MS. LEPORE: Objection. Form.

11 THE WITNESS: The construction requires
12 producing a down-converted signal with an enhanced
13 signal-to-noise power ratio. So I think with any claim
14 construction, if you don't -- if you don't meet that part
15 of the construction, then you would not produce.

16 BY MR. MAGEE:

17 Q Okay. And you can determine that by comparing
18 the signal-to-noise ratio to a baseline; is that correct?

19 A "Baseline" was the word I -- I used.

20 Q Okay. Why don't we take a break.

21 A That would be good.

22 MR. MAGEE: Great.

23 (Recess)

24 BY MR. MAGEE:

25 Q Okay. We are back on the record.

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1 Okay. I believe we were discussing the Florida
2 district court construction, which is set forth in
3 paragraph 199 of your declaration in the '935 IPR.

4 Do you remember that?

5 A Yes, paragraph 199 in the '935.

6 Q Okay. You state in paragraph 200 that the
7 Florida construction also captures the meaning of matched
8 filtering correlating module; is that right?

9 A That's what paragraph 200 says.

10 Q Okay. Why do you have two different
11 constructions for matched filtering correlating module in
12 your declaration?

13 A I believe it's quite common for there to be
14 multiple constructions based upon the different parties
15 involved and the different legal aspects that are outside
16 of my -- you know, my purview.

17 My understanding is the Florida district courts
18 provided a construction, and then my understanding is a
19 Texas district court provided a plain and ordinary
20 construction. And so I used, you know -- made sense to
21 use those two, the Florida one. And then because the
22 Texas had a plain and ordinary, I provided how I think a
23 POSITA would understand that. That's kind of how those
24 two were used.

25 Q Okay. And in your opinion, a person of ordinary

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1 skill in the art would not view the Florida district
2 court construction as the plain and ordinary meaning of a
3 matched filtering/correlating module; is that correct?

4 A I put forth my understanding of what a POSITA
5 would understand in paragraph 196.

6 Q Okay.

7 A And that's the construction I think they would
8 understand.

9 Q Okay. And that's different than what's in the
10 Florida district court construction; correct?

11 A I think we discussed the details, but the
12 Florida is -- has different words. It's much longer.
13 But, you know, construction is something that's left to
14 the Courts to decide, so I -- I treat it as it is from
15 them.

16 Q Okay. Going back a little bit to your technical
17 background, I'd like to go to paragraph 100. I believe
18 it's on page 37 of the PDF.

19 A I apologize.

20 Page 100 of the PDF?

21 Q No, no. Sorry. Sorry. Your declaration in the
22 '935 IPR --

23 A Yes.

24 Q -- paragraph 100, and I believe that's on page
25 37 of the PDF.

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1 A Okay. All right. I have paragraph 100 up.

2 Q Okay. And paragraph 100 is the start of a
3 section labeled "10 Matched Filter and Correlator";
4 correct?

5 A That is the heading of that section.

6 Q Okay. And if we could scroll down to paragraph
7 104, it's about two pages later.

8 A 104.

9 Q 104.

10 A Yes, 1 -- paragraph 104 in the '935 declaration.
11 I got it.

12 Q All right. We're in the same place.

13 In paragraph 104, you have an excerpt Figure
14 7.35; is that right?

15 A 7.35 is shown from -- I believe it's
16 Exhibit 2017.

17 Q That's right. And if you need to bring up
18 Exhibit 2017, please do. I'm not trying to limit you on
19 that.

20 And -- sorry. Do you need a moment?

21 A No, I'm -- I'm there.

22 Q Okay. Exhibit 2017 is a textbook entitled
23 Communication Systems Engineering; correct?

24 A I -- Communication Systems Engineering by
25 Proakis.

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1 Q Got it.

2 A Bad pronunciation. Sorry.

3 Q Can't correct you. I don't know what it is.

4 In Figure 7.35, there are a series of boxes with
5 a Greek letter. I think that's psi, if I remember
6 correctly, Y_1 , Y_2 , Y_N .

7 Do you see that?

8 A Do see the symbol, and I call it psi.

9 Q Okay. And what is -- in Figure 7.35, what is
10 $Y_N(T-t)$? What is that?

11 A So this chapter, Section 7.5, describes linearly
12 weighted or though normal basis functions $Y_N(T)$. So -- by
13 the way, $Y_N(T)$ is psi subscript $N(T)$.

14 Q Okay. What -- what is a basis function?

15 A In mathematics, maybe the simplest example is a
16 sign and a cosine would be basis functions. They're --
17 they're orthogonal to one another. So mathematically you
18 can take signals, and you can correlate them with a basis
19 function to see how much they are like it.

20 You know, in school we sort of learn, you know,
21 if you have an arrow in three dimensions, you can break
22 it apart into the X component, the Y component, and the Z
23 component. A similar way, this is signal processing.
24 But that's kind of the similar approach.

25 Q And the basis function in 7.35 -- is that

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1 orthogonal to the received signal?

2 A No. They are orthogonal to one another. So Y
3 of 1 is orthogonal to Y of 2, and both of those are
4 orthogonal to Y of 3, etc.

5 Q Okay. And -- okay. So Y1 is related to Y2, and
6 Y3 down to YM, by they're each orthogonal to one another;
7 is that right?

8 A Not -- not precisely. The point of
9 orthogonality is they're not related. They're
10 independents. The orthogonality means there's -- in
11 whatever structure you're looking at or mathematical
12 framework, whatever Y1 is, it has no part of it is Y2.

13 So, for instance, sine doesn't have a cosine
14 component; it just has a sine component.

15 Q I see. Okay. Got it.

16 And you're just going back earlier to your
17 discussion of basis function. You were saying
18 mathematically you can take signals, and you can
19 correlate them with a basis function to see how much they
20 are like it.

21 In 7.35, are we correlating the received signal
22 with the basis functions to see how much they are alike?

23 A So 7.31 talks about finding the projection of
24 the input RFT onto N basis functions, and so the inputs
25 are and the basis functions are Y 1, 2, 3, 4. And if you

1 continue on the page, says "in the case of the
2 demodulator described above, the N matched filters are
3 matched to the basis functions, and 7.3 illustrates the
4 matched filter demodulations." So the matched filters
5 are matched to the basis functions, Y of K.

6 Q Oh, I'm sorry. I lost where we are.

7 Which page were you on? I'm sorry.

8 A I apologize. It spans a page. So Exhibit 2017,
9 the reference top -- page 371, and there's Figure 7.31.

10 Q Okay.

11 A Do you see that?

12 Q Yes.

13 A Okay. So what's going on in 7.31 is we're
14 projecting the input R onto the N basis functions, and
15 one of the ways you can do that is with correlation. So
16 you see it's correlation type demodulator, and so then
17 mathematically describes that.

18 And then it says, in the -- going to the next
19 page, 376, it says "in the case that the demodulator
20 described above the N matched filters are matched to the
21 basis functions, Figure 7.35 illustrates the matched
22 filter type demodulator that generates observed variables
23 RK."

24 And if you look in 7.35, they've got R1, R2, and
25 RN. And those are the signals that are for each one of

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1 the -- according to each one of the Y1, Y2.

2 So R1 is for Y1. R2 is for Y2.

3 Q Okay. I'm looking at Figure 7.33. I think it's
4 at top of page 376; is that right?

5 A Yes.

6 Q Okay. I zoom in.

7 So in Figure 7.33, the label says "signal S of T
8 and filter matched to S of T."

9 Do you see that?

10 A I do see those. Figure 7.33A is the signal, and
11 B is the impulse response of a filter matched to S.

12 Q Okay. What does it mean that the filter is
13 matched to S of T?

14 A So that it is like S of T. If you look at it,
15 it is -- the signal is a triangle, and so the -- you
16 know, the matched one is also a triangle.

17 Q Okay. So the -- the filter is matched to the
18 input signal; is that right?

19 A That's right.

20 So in a theoretical sense, you -- you match
21 your -- your filter to the incoming signal, and then
22 that's what's being described here in the book.

23 Q Okay. Okay. I got it.

24 Okay. Why don't we shift gears just a little
25 bit.

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1 Can you open Exhibit 2015.

2 A 2015 in the '935?

3 Q Yes, please.

4 A Okay.

5 Attempting -- okay. There we go.

6 Unfortunately Zoom sometimes -- Adobe Acrobat
7 and Zoom don't like each other. I don't know why.

8 But I -- Exhibit 2015 up -- and just to clarify,
9 the file label I have is "Master Priority Claim Chart For
10 the '177 Patent."

11 Q Okay. I believe that's correct.

12 And I just want to verify, I believe you have a
13 similar chart for -- labeled Exhibit 2015 in the '936
14 matter; is that right?

15 A Yes, of course I do. The claims are different,
16 so the two charts are different, but they relate to the
17 same Eddie chip.

18 Q Okay. Just for clarity, let's stay on
19 Exhibit 2015 in the '935 matter.

20 A Okay. I understand.

21 Q And you created this chart; correct?

22 A Yes, I created the chart with metadata, etc.,
23 things that were provided to me from -- from the
24 attorneys or from David Sorrells' -- or from native files
25 that I had.

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1 Q Understood.

2 Can we go down to page 5 of this PDF.

3 A Sure.

4 Q Sorry. We there?

5 A I apologize. I am on page 5 of the PDF for
6 Exhibit 2015 in the '935 IPR.

7 Q Okay. Thank you.

8 On this page is a schematic, and I believe your
9 text says the schematic is drawn from the GDSII file of
10 the chip; is that right?

11 A Yes, the GDSII file is kind of a generic
12 parlance. I believe this specific file had a -- an
13 extension SFN. But GSDII is just a layout -- a layout
14 program -- layout -- a standardized integrated circuit
15 layout software standard.

16 Q Okay. So sorry. It's G-D-S two, and --

17 A That's how we say it. But it is GDSII.

18 Q Excuse me. That's fine. I will use the correct
19 nomenclature for it.

20 A I don't know if we're lazy or -- I don't know.
21 That's how I -- that's how I write it out, so --

22 Q Fair enough.

23 You noted that this file had an extension SFN.

24 What is the extension SFN that you were
25 referring to?

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1 A Just a moment.

2 So the file -- the file extension that I viewed
3 had an SFN extension, and this was created long ago,
4 obviously from 1987 -- sorry -- '97 or '98. We'd have to
5 check the dates. But -- so it was an old legacy
6 software, and that's how they drew the layout, with an
7 SFN. And I was able to download a program so that I
8 could view that SFN file.

9 Q Okay. And what's drawn here is what that
10 program showed you in terms of the layout of the SFN
11 file; is that right?

12 A No, that is -- that is incorrect. If you could
13 open up Exhibit 2012, which is labeled [REDACTED].

14 Q Sorry. It's just opening. Give me one second
15 here.

16 A I apologize.

17 Oh, it is -- it is the same. I was looking at
18 the other one, but it's the same one here. So yeah.
19 Exhibit 12.

20 Q Okay. Exhibit 2012, which is titled [REDACTED] --
21 I have that open.

22 A Okay. That is a -- that is what an SFN file
23 looks like.

24 Q Okay.

25 A And so when you open it up, it has -- the way to

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1 think about it is the question you were asking about 2015
2 is the schematic, and then when you want to go make an
3 integrated circuit, you got to draw a bunch of polygons
4 that represent the circuits, and Exhibit 12 is a picture
5 of what those polygons look like.

6 Q Okay. Then you'll forgive me.

7 In 2015, then, the schematic that's shown on
8 page 5 -- is that something you drew from Exhibit 2012?

9 A So Dr. Steer, Michael Steer, originally created
10 this schematic from the native SFN file. I took the
11 schematic, I had the SFN file, and I went into the SFN
12 file and went around to check that the schematic was
13 correct, and I didn't find any inconsistencies. The
14 switches and everything were all as -- as the schematic
15 showed.

16 Q Okay. So you did check this, and it's -- it's
17 consistent with the SFN file depicting the actual
18 description of the circuit?

19 A Yes.

20 Q Okay. In this schematic on page 5 of
21 Exhibit 2015, there are some empty boxes. There's one,
22 two, three, four, five on the left, four on the top, and
23 two on the right.

24 Do you see what I'm -- I'm referring to?

25 A I do, yes.

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1 Q Okay. What are those empty boxes?

2 A If you just look at Exhibit 2012, you'll see
3 that there's [REDACTED].

4 Q Uh-huh.

5 A Those are the -- those are the [REDACTED]
6 [REDACTED], and so that was drawn
7 here to just kind of represent that.

8 Q Okay. So the -- the -- in Exhibit 2012, the
9 [REDACTED]
10 [REDACTED]
11 [REDACTED], and those map to the same rectangles in 2015;
12 is that right?

13 A That's what the [REDACTED]
14 [REDACTED].

15 Q Okay. Sorry.

16 And just to be clear, [REDACTED] in 2012 are
17 representing [REDACTED]?

18 A Correct.

19 Q Okay.

20 A And then we just draw [REDACTED] again in 2015.

21 Q Okay. So [REDACTED] in 2015 are the same [REDACTED]
22 [REDACTED] in Exhibit 2012?

23 A That's what they're meant to represent.

24 Q Okay. And so that's essentially the [REDACTED]
25 [REDACTED]; is that right?

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1 A I think, yes, you would wire bond the chip to a
2 package, and that package would have pins. And in my
3 understanding, this was done on a -- if you -- let's just
4 see an easy way. Where will we -- okay.

5 If you go to page 6 is fine. Just the next
6 page, you'll see a blue box on the lower left.

7 Q Yes.

8 A Okay. That would be the packaged -- so that
9 would be -- [REDACTED] would go inside there. They would
10 wire bond it, which is just connecting it to the pins,
11 and then that pinned package would go onto a printed
12 circuit board and is tested by [REDACTED], for instance.

13 Q Okay. And my resolution on page 6 is a little
14 poor, but it looks like there's [REDACTED]; is
15 that right?

16 A If you want to go to [REDACTED] -- I'm sorry -- page
17 8, that might be easier for you.

18 Q Yes.

19 A And the -- so what you said, I think, in general
20 you've got the right idea, but I think the more precise
21 way to say it is the package has [REDACTED], and this is
22 quite common when you've got a prototype. There's no
23 particular reason why you have to use a package with the
24 same number of pins.

25 So I'm assuming they just put this in the

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1 package and then wire bonded it so that it would fit.

2 Q I see. Okay.

3 And perhaps you can help me out. If -- have you
4 mapped the pins here shown on page 8 to [REDACTED] on page
5 5?

6 A The -- just looking to see if I had a diagram
7 that would make it simpler.

8 There's [REDACTED] in the entire -- in the
9 entire device, and it's [REDACTED].
10 There's -- if you -- I mean, if you'd like to take a look
11 at -- just make sure it's -- use the same numbering
12 system.

13 2016, Exhibit 2016, in the Sorrells' -- it's
14 David Sorrells' declaration, 2016.

15 Q Just give me one second here. I apologize.

16 A No problem.

17 Q Okay. Sorry. I'm there.

18 A Just a moment. I just wanted to make sure I had
19 the exact '935 document up. So I believe it's page 11.

20 Q Uh-huh.

21 A So David Sorrells was the designer of this. And
22 so if you look on the bottom of page 11, he maps out the
23 pins for all of these with the pins on the parts. And,
24 you know, as I said, from the layout alone you can
25 identify [REDACTED] And

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1 from the schematic, it's clear where [REDACTED] is
2 connected, but David Sorrells also labels it all here.

3 Q I see. Okay. Okay.

4 If we could go back to your chart, and I guess
5 we can go to page 8 because I think the resolution is
6 slightly better on that.

7 So this is Exhibit 2015 to the '935 IPR on page
8 8.

9 A Exhibit 2015, '935 IPR, page 8, yes.

10 Q Great.

11 A I'm there.

12 Q Okay. And there are, I guess, broadly speaking,
13 two circuits boxed in blue and red on the right side of
14 this figure.

15 Do you see those?

16 A I do see the blue outlined and the red outlined.

17 Q Okay. And those are respectively connected to
18 the [REDACTED]; correct?

19 A The blue is connected to [REDACTED], and the red is
20 connected to [REDACTED].

21 Q Okay. And I just want to make sure I'm reading
22 some of this correctly.

23 So it's a little hard to read, but it says [REDACTED]
24 [REDACTED] and then there's a parens with some
25 values.

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1 Do you see that?

2 A I do see that.

3 Q Okay. That's referring to the [REDACTED]
4 [REDACTED]; correct?

5 A That's correct.

6 Q Okay.

7 A There possibly might be [REDACTED] or something,
8 but yes, you have the right idea. It's between [REDACTED]
9 [REDACTED].

10 Q Okay. Got it. Sorry. I didn't mean to
11 interrupt.

12 It says [REDACTED] -- that's probably cut off --
13 [REDACTED]; is that right?

14 A That's correct.

15 Q Okay. So the received signal here was at
16 [REDACTED]; is that right?

17 A To answer your question, yes, there is a -- a
18 report from [REDACTED], and -- yeah.
19 That will confirm they operated the board at an RF signal
20 of [REDACTED], and that's in Exhibit 2010.

21 Q Okay. And again, just for clarity, staying on
22 Exhibit 2015 in the '935 IPR at page 8, there are a
23 number of components, and I just want to make sure I -- I
24 have it correct.

25 So there are [REDACTED]

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1 [REDACTED]; and I believe each of those is [REDACTED]

2 [REDACTED]; is that right?

3 A That's correct.

4 Q Okay. And then there's [REDACTED]
5 [REDACTED].

6 Is that [REDACTED]?

7 A Yes.

8 Q Okay. And [REDACTED]
9 [REDACTED]; is that right?

10 A That's correct.

11 Q Okay. And then just to close it out, [REDACTED]
12 [REDACTED]; is that right?

13 A That's correct.

14 Q Okay. And I apologize. I just want to go back
15 and make sure I had another part correct. Back to page 5
16 of Exhibit 2015.

17 A Yes.

18 Q Okay. So I just want to make sure I'm reading
19 this correctly.

20 The lines are for circuit diagrams, wires
21 connecting the devices; correct?

22 A The lines are -- are wires that connect to the
23 device. Usually the person drawing it puts a circle when
24 two wires connect to one another, but people sometimes
25 make -- make mistakes, so -- but in general, yes, there's

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1 a specific area we can look at that.

2 Q Okay. But -- well, okay. Just to make it
3 easier, why don't we just sort of stay in the upper left
4 of the figure. So there is [REDACTED]

5 [REDACTED]

6 A Yes.

7 Q Okay. So there's a [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 Do you see what I'm referring to?

11 A Yeah. I think it's the -- [REDACTED]

12 [REDACTED]. But yes. Yes, you are correct.

13 Q Sorry. I misspoke. It's -- yes. Sorry. To be
14 clear, I'll re-ask it.

15 There's [REDACTED]

16 [REDACTED]

17 [REDACTED]; is that correct?

18 A That's correct, yes.

19 Q Okay. And that [REDACTED]

20 [REDACTED]

21 A That's right.

22 Q Okay. And then if I'm reading -- just to make
23 sure I have it right, that same [REDACTED]

24 [REDACTED]

25 [REDACTED]; correct?

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1 A That is correct.

2 Q Okay. [REDACTED]

3 [REDACTED]

4 [REDACTED]

5 [REDACTED]; correct?

6 A That's what's shown in the diagram. This --
7 just the schematic was put together from the layout, so
8 that [REDACTED].

9 Q Oh, I see.

10 A And now there's -- yeah. It's just annotation.
11 I think someone mistakenly put a circle there, or the
12 software program thought a circle went there, but I think
13 it's just a box.

14 Q Okay. So that's not actually a connection
15 there?

16 A That's not my understanding.

17 Q It's not -- not a wire, so I guess it's not a
18 connection.

19 A No.

20 Q Okay. So sorry. I want to take a step back.

21 If I recall correctly, you said Dr. Steer
22 created this diagram from the SFN file and that you
23 confirmed generally the accuracy of it; is that correct?

24 A That -- that is correct. I looked at the native
25 file, the SFN, and I focused on the -- this chart, and so

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1 that was focusing, for instance, on the switch. And the
2 switch driver is on the -- on the right side.

3 Q Okay. I have a question. [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 Do you see that?

7 A I do see that, yes.

8 Q Where does [REDACTED]

9 [REDACTED]

10 A I would have to pull up the layout for that one.
11 The -- the box labeled [REDACTED] is not
12 used in the claim chart or on the board, so it wasn't
13 something that I -- I analyzed. This could be [REDACTED]
14 [REDACTED], or it could be a dummy device that
15 doesn't connect anywhere, but I'd have to check the
16 layout to see -- to see what's there.

17 Q Okay. I know we haven't been going for a full
18 hour. Is it okay if we take a break for maybe 10
19 minutes?

20 A Sure.

21 MS. LEPORE: Fine.

22 (Recess)

23 BY MR. MAGEE:

24 Q So, Dr. -- Dr. Ricketts, I just wanted to make
25 sure I map something correctly. So I'm looking at both

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1 page 5 of Exhibit 2015, and then I'm also looking at
2 Dr. Sorrells' declaration, which is Exhibit 2016 at page
3 11. And I'm just -- I want to make sure I have the pads
4 mapped correctly between the two.

5 Is it possible for you to review both at the
6 same time?

7 A Just to clarify, looking at Exhibit 2016,
8 everything's in the '935, 2016, page 11; and 2015, page
9 5.

10 Q Correct.

11 A I am looking at the two.

12 Q Okay. And I just wanted to make sure I have the
13 pads correct to how Dr. Sorrells identified it.

14 So if I'm reading it correctly, [REDACTED]
15 [REDACTED] of Exhibit 2015, inside the box labeled
16 [REDACTED]
17 is that right?

18 A That's correct. The two -- the two boxes on the
19 [REDACTED]

20 Q Okay. And then inside the annotated
21 [REDACTED]

22 [REDACTED] is that correct?

23 A Just a moment. That is what Mr. Sorrells has in
24 his -- in his -- on page 11, yes.

25 Q Okay. And your understanding is that's correct?

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1 You're not disputing what Dr. Sorrells put on his --

2 A I apologize. I am not -- I am not disputing --

3 Q Okay.

4 A -- Mr. Sorrells there, no.

5 Q Okay. And then just inside that same

6 [REDACTED] annotated box on the left side,

7 there are [REDACTED]

8 [REDACTED]

9 (Interruption by the reporter)

10 BY MR. MAGEE:

11 Q Let me re-ask the question because there was a
12 little bit of noise there.

13 Inside [REDACTED] box on page 5
14 of Exhibit 2015, there are [REDACTED]

15 [REDACTED] --

16 A Yes.

17 Q [REDACTED]

18 [REDACTED]; correct?

19 A [REDACTED] that's what's on page 11
20 of the 2016 exhibit.

21 Q Okay. And there are [REDACTED]

22 [REDACTED]

23 [REDACTED] is that right?

24 A [REDACTED], yes.

25 Q Okay. Okay. And then I just had one other

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1 question here on Exhibit 2015, on page 18.

2 A Just a moment.

3 Okay. I'm on page 18 of the 2015 exhibit; is
4 that correct? Exhibit 2015?

5 Q Yeah. So we should be in the '935 IPR,
6 Exhibit 2015, page 18.

7 A Yes.

8 Q Okay. In what is, I think, the fourth
9 paragraph, it starts [REDACTED]

10 [REDACTED]

11 Do you see that?

12 A I do see that.

13 Q Okay. And you cite to Exhibit 2016, which I
14 believe is the Dr. Sorrells declaration; is that right?

15 A Just a moment.

16 I do submit to -- sorry. I do reference
17 Mr. Sorrells' declaration, 2016.

18 Q Okay. And in your chart, your understanding of
19 [REDACTED] came from Dr. Sorrells; correct?

20 A Yes, [REDACTED] -- just a moment.

21 Q Sure.

22 A So I think you need to maybe start again.

23 So [REDACTED], I cite to
24 Mr. Sorrells' declaration. That's correct.

25 Q That's right.

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1 And I was just -- my question was just your
2 understanding of what [REDACTED]

3 [REDACTED] came from Dr. Sorrells; is that correct?

4 A I did not -- maybe state it this way. I did not
5 do any additional testing or simulation. The information
6 on the -- the clock came from Mr. Sorrells.

7 Q Okay. Okay. We can probably put this exhibit
8 aside for now.

9 Can you open, or if you have open, turn to
10 Exhibit 2024 in the '936 IPR.

11 A Okay. Just one minute.

12 Just for housekeeping, I'll assume and I'll try
13 to state clearly that the questions we're going to talk
14 are about the '936. If you switch back, do let me know
15 so that I can make sure that I respond appropriately.

16 Q Yes.

17 A I have my declaration in the '936 up.

18 Q Okay. If we could turn down -- turn down to
19 page -- I guess it's 72 of the PDF. It's a section
20 entitled "Overview of the Alleged Prior Art."

21 A I see that section starts on paragraph 196 in
22 the '936 declaration.

23 Q Okay. And this first section or subsection A is
24 U.S. Patent Number 6,230,000 to Tayloe; is that correct?

25 A Yes, that is -- that is correct.

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1 Q Okay. And just for clarity, the same Tayloe
2 reference is used in both the '177 and '528 patent IPR's;
3 correct?

4 A The -- it is the same patent in both. Of course
5 the claims are different, so my analysis is different
6 between the two, but it's the same basic reference.

7 Q Okay. So I just want to scroll down to
8 paragraph 203. Should be about two pages down from
9 there.

10 A Just a moment.

11 Q Uh-huh.

12 A Okay. I am at paragraph 2,003.

13 Q Okay. And I want to look at Figure 3 in that
14 paragraph.

15 This is Figure 3 from Tayloe; correct?

16 A Figure 3, Tayloe, which is Exhibit 1004 in the
17 '936 IPR.

18 Q Okay. And the colored annotations here are
19 yours; correct?

20 A Yes. I'm not sure if I asked to put them on in
21 those colors or I put them in a color and the colors got
22 changed, but yes, the annotations are -- are meant to be
23 there.

24 Q Understood. Yeah. I don't know that there's
25 any magic to the colors themselves.

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1 A Right.

2 Q So I just want to look at the box labeled "50."
3 I guess it's the upper yellow box in that Figure.

4 A Yes, I see Figure 50.

5 Q Okay. What is that circuit -- sorry. There was
6 some noise there. Let me just re-ask the question.

7 The circuit in the box labeled "50" -- what is
8 that circuit doing?

9 A Tayloe describes those as Summing Amplifiers 50.
10 Summing Amplifier 50 differentially sums the 0-degree
11 output and the 180-degree output, thereby producing base
12 span and phase signal 54.

13 Q Okay. And what's the purpose of the resistor
14 that's in parallel with the negative terminal?

15 A That would be the resistor, if you will. If
16 it's a triangle, it's on the top of the triangle.

17 Q Correct. Yes. That resistor in parallel with
18 that node.

19 What's the purpose of that resistor?

20 A So that resistor -- well, it could be there for
21 a number of reasons. Tayloe doesn't describe
22 specifically the resistor, so it could just be a
23 resistor -- high-value resistor that's needed for
24 stability.

25 It could also provide a gain for just the one

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1 leg. That's two things that it could do.

2 But Tayloe really just describes 50 as a -- as a
3 summing amplifier.

4 Q Okay. Why isn't there a similar resistor in
5 parallel with the positive terminal of that device?

6 A That is -- this is the configuration that Tayloe
7 decided to use, and I -- I don't know the answer to that.
8 That would be a different circuit than what Tayloe has
9 used. So I don't -- I can't comment on why Tayloe didn't
10 make a different circuit there.

11 Q Okay. But as it is, the feedback circuit on the
12 negative terminal you said could provide a different gain
13 on that leg; is that right?

14 A Yeah. And I should just be precise. By leg,
15 there's a -- a resistor on Figure 3. So if we just look
16 at the Output 42, it shows 0 degrees, just as a
17 reference. It's a wire. Wire flows into a resistor, and
18 then goes into the negative terminal to be cleared.
19 Nothing flows into the negative terminal. It's just
20 where it's connected.

21 And then there's a resistor around for feedback,
22 so that's sometimes used for adjusting -- making a gain.
23 But like I said, you have to keep the two, 0 and
24 180 degrees, in balance.

25 And, like, my declaration talks about the

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1 importance of that in the context of Tayloe.

2 Q Okay. And if I understood your declaration
3 correctly, you said the terminal going into the positive
4 node on the op amp connects to the gate of a transistor;
5 is that right?

6 A Just want to be precise for you.

7 Q Sure.

8 A The -- and this is paragraph 219. Just with
9 respect to the plus, the plus input is extremely high
10 impedance, 2 megaohms. And I believe I -- I cite an
11 example of a widely used op amp that has a 2-megaohm
12 input, and most of the op amps I know would be even
13 higher than that. But that's just on the order of where
14 they'd be.

15 Q Okay. I guess just to simplify things, in
16 paragraph 215 of your declaration, there's sort of a
17 zoomed-in portion of this figure.

18 Do you see that?

19 A I do see that, right above paragraph 216.

20 Q That's right.

21 And if I understood what you just said, the plus
22 terminal, which is the lower terminal of the op amp,
23 would have a resistance in at least one example of 2
24 megaohms, although it could be higher; is that right?

25 A Just to clarify, both the plus and the minus

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1 input would have very high impedance, and I -- I did give
2 an example. The way operational amplifiers are used, by
3 definition their input impedance is very high. So 2, 10
4 megaohm -- they'd both be very high.

5 Q Okay. And in Tayloe there's a resistor in
6 series with that input to the positive terminal.

7 Do you see that?

8 A I do see that.

9 Q Okay. What's the purpose of that resistor if
10 the op amp already has an extremely high impedance?

11 A Once again, this is Tayloe's design. I don't --
12 Tayloe doesn't refer to what that resistor does, but this
13 is the design that Tayloe has conceived and put forth in
14 the figures.

15 So I can't really comment on why -- why Tayloe
16 put it there. A POSITA would simply understand that the
17 impedance looking into that resistor would be very high
18 because the impedance to the plus node is very high.

19 Q Okay. And just staying on that figure, there's
20 a resistor in parallel with a negative terminal.

21 That would change the impedance of that
22 terminal; correct?

23 A The feedback resistor, just -- just a moment. I
24 think I discuss this in paragraph 219, that a resistor
25 can be placed as Tayloe's shown it; but to balance the

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1 reception, it would need to be a very high resistance.
2 All the resistors would need to be very high so that you
3 don't disrupt the balance between the 0 and the
4 180 degrees.

5 Q Sorry. You said it was paragraph 219?

6 A Yes, 219. It's on the next page.

7 Q So you -- you note that a person of ordinary
8 skill in the art understands that there cannot be a
9 significant mismatch/the impedance of the two inputs.

10 What did you mean by "a significant mismatch"?

11 A So the -- Tayloe is trying to build a receiver
12 that is taking signals from the 0-degree and the
13 180-degree lines, lines 42 and 46, and they are
14 differentially summing. And so if there is any mismatch
15 in the pads for the plus -- sorry -- for the 180 and the
16 0, then you'd have an offset error or another error that
17 would go into your output amplification that would be
18 undesired.

19 Q Okay. And looking at the -- the circuit, there
20 is a path for current to flow sort of through the
21 feedback resistor.

22 Is that current flowing from the output to the
23 input? Or from the input to the output of the op amp?

24 A The -- it's a -- what do I want to say?

25 It's a convention. So the way operational

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1 amplifiers are taught, if we think about a current
2 flowing from left to right in the series resistor with
3 the minus 1, then a current would flow -- the current has
4 to continue, and the current would flow left to right in
5 the resistor above the triangle.

6 Q Okay. And just in terms of general op amp
7 design, if you want to keep the two input impedences
8 balanced, wouldn't it be preferable to have a symmetrical
9 design with a feedback resistor on both paths?

10 A This is Tayloe's design, and so this is as he
11 presents it to a POSITA. There's lots of designs out
12 there in the literature that POSITAs could go learn
13 about, but -- but Tayloe's disclosing here is the circuit
14 that we see.

15 Q No, I understand. I'm not asking you to
16 redesign Tayloe's circuit.

17 I'm just asking more generally, like, what are
18 the benefits of an asymmetric circuit like this versus a
19 symmetrical circuit?

20 A I haven't really analyzed that in the context of
21 any of the material here.

22 Q Okay. So sitting here today, you're not aware
23 of any benefits of an asymmetric amplifier like this as
24 relative to a symmetric one?

25 MS. LEPORE: Objection. Form.

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1 THE WITNESS: I am providing -- sorry.

2 MS. LEPORE: That's okay.

3 THE WITNESS: I haven't provided any opinion on
4 one.

5 BY MR. MAGEE:

6 Q Okay. Are there any advantages to a symmetric
7 circuit as compared to an asymmetric circuit?

8 MS. LEPORE: Objection. Form.

9 THE WITNESS: I think the easiest way -- I think
10 we discussed this previously when we were discussing --
11 there's a color-coded picture above paragraph 220. But,
12 you know, I say if the input impedences in the blue and
13 yellow don't match the voltage, measurements will not be
14 symmetric, and an error will occur in the voltage
15 measurements.

16 So there I'm giving one -- a reason why I think
17 a POSITA would understand these are high. But also
18 there's a discussion of -- of symmetry and an error if
19 you don't have it in this particular description. And if
20 you have very high resistors, you would reduce that. So
21 I think that's the only opinion I give on symmetric.

22 BY MR. MAGEE:

23 Q Okay. So if we go down to paragraph -- I guess
24 it's 291 --

25 A And just for the record, I think everything

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1 we've been talking about is on the '936 IPR. We haven't
2 switched back yet to anything.

3 Q Correct. So far we've stayed entirely within
4 the '936 -- or your Exhibit 2024 to the '936 IPR?

5 A All right. I am on paragraph 291; is that
6 correct?

7 Q Yes.

8 A Okay. There.

9 Q Okay. In paragraph 291, this is showing an
10 illustration of Tayloe with Amplifier 50 replaced by
11 Macnally's biquad two-pole filter.

12 Do you see that?

13 A Yes, the 50 has been -- between the two figures
14 has been changed over to the -- the Macnally biquad in
15 the blue box.

16 Q Okay. And the Macnally biquad is a symmetric
17 circuit; correct?

18 A Just looking at the schematic above 292, yeah.
19 From what I see there, that is a symmetric circuit.

20 Q Okay. And I just want to make sure I have this
21 correct.

22 You have no opinions as to whether there are any
23 advantages or disadvantages to using this symmetric
24 circuit as relative to the asymmetric circuit in Tayloe;
25 correct?

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1 MS. LEPORE: Objection. Form.

2 THE WITNESS: I think your question was did I
3 have an opinion about the Macnally -- the Macnally
4 differential amplifier versus 50 and Tayloe. And I
5 believe I provide some opinions on the differences
6 between those two with respect to component account, with
7 respect to Macnally, you know, being a -- a lower
8 impedance in that respect. So there are some differences
9 that I cite. But maybe if there's something specific, I
10 can answer that better.

11 BY MR. MAGEE:

12 Q Sure.

13 Are there any advantages to using the Macnally
14 biquad symmetric circuit as compared to Tayloe's
15 asymmetric circuit?

16 A I think your question is did I provide an
17 opinion if Macnally's biquad filter has a benefit over
18 Tayloe's 50. And I don't believe that I provide an
19 opinion on the benefit of the biquad over Tayloe's 50.

20 Q Okay. Sitting here today, can you think of any
21 benefits of using Macnally's biquad filter over Tayloe's
22 design in Circuit 50?

23 MS. LEPORE: Objection. Form.

24 THE WITNESS: I mean, I spent quite a bit of
25 time thinking about everything in my declaration.

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1 Sitting here I don't have any new pieces that I would add
2 to what's already in the document.

3 BY MR. MAGEE:

4 Q Okay. And I just want to be a little bit clear.
5 Are you saying there are no advantages? Or that
6 you are not aware of any advantages?

7 MS. LEPORE: Objection. Form.

8 THE WITNESS: For clarity, I have not provided
9 in my declaration any opinion of advantages of the biquad
10 filter over Tayloe 50 in my declaration for the '936.

11 BY MR. MAGEE:

12 Q Okay. Did you consider any advantages of the
13 Macnally biquad filter as compared to Tayloe's Circuit
14 Number 50?

15 MS. LEPORE: Objection. Form.

16 THE WITNESS: Could you just re-ask the
17 question. I want to make sure I heard it correctly.

18 BY MR. MAGEE:

19 Q Sure.

20 Did you consider any advantages of the Macnally
21 biquad filter as compared to Tayloe's Circuit Number 50?

22 A As we said, there's nothing in the report. I
23 don't recall whether I'd considered those or not. Tayloe
24 provides a Solution 50, and Tayloe describes itself as
25 being a -- a new, high -- a -- a new, good performing

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1 design for mixers. And so I focused just on the -- the
2 Tayloe 50 and understanding that.

3 Q Okay. Is it your understanding that petitioner
4 argues that there would be advantages to using the
5 Macnally biquad in the Tayloe circuit?

6 MS. LEPORE: Objection. Form.

7 THE WITNESS: I just want to make sure I got the
8 first part of your question I understood right, if you
9 could just repeat it for me.

10 BY MR. MAGEE:

11 Q Sure.

12 Is it your understanding that the petitioner
13 argues that there would be advantages to using the
14 Macnally biquad in the Tayloe circuit?

15 MS. LEPORE: Objection. Form.

16 THE WITNESS: I believe in generally -- in
17 general, for example, paragraphs 318 through 338, just by
18 way of an example, I list some assertions that petitioner
19 makes, which I believe they are considering to be a -- a
20 benefit. And so I'm -- I'm aware that petitioner put
21 forth arguments for benefits, and I discuss some of those
22 in those cited paragraphs.

23 So yes, I -- I do understand that the petitioner
24 put forth some benefits, and I address those in part in
25 the reference sections.

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1 BY MR. MAGEE:

2 Q Okay. But earlier you testified that, "I don't
3 recall whether I'd considered any advantages of the
4 Macnally biquad filter as compared to Tayloe's Circuit
5 Number 5. Tayloe describes itself as being a new high --
6 a new good performing design for mixers. And so I just
7 focused on the Tayloe 50 and understanding that."

8 Do you remember that?

9 A I do. And I think the question as I understood
10 it was did I on my own go out and think about biquad
11 benefits separately and independently.

12 And I -- I had said before, I don't provide an
13 opinion of benefits in my declaration. Here we're
14 looking at -- we just pointed out in the Sections 318 and
15 on, petitioner's put forth some benefits. So I of course
16 thought about the petitioner's benefits, and I provided
17 what I thought -- what is my opinion based upon these
18 benefits that are there.

19 So the question seemed a little odd to me, so
20 maybe my answer was just simply independently I did not
21 go out and find and -- did not recall thinking about
22 additional benefits not raised by the petition in
23 preparing the declaration.

24 Q Can you open Exhibit 1017, which should be an
25 article titled "A 900-MHz CMOS Direct Conversion

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1 Receiver" by Behzad Razavi.

2 MS. LEPORE: This is still for the '936?

3 MR. MAGEE: I believe it's used in -- it's
4 definitely used in the '936.

5 THE WITNESS: Right. I -- just a moment.

6 Exhibit 1017 from the '936 proceedings on.

7 BY MR. MAGEE:

8 Q Yes. And that -- that should be the article by
9 Behzad Razavi, "A 900-MHz CMOS Direct Conversion
10 Receiver"; is that right?

11 A That is correct.

12 Q Okay. Can we go to the second page.

13 In the bottom left of that is a Figure 3.

14 A See Figure 3.

15 Q Okay. And that's -- that figure is labeled
16 "LO/Divider Circuit."

17 Do you see that?

18 A I do see those words in the caption.

19 Q Okay. Did you analyze this circuit at all in
20 forming your opinions?

21 A I have -- I apologize for the camera.

22 I -- I have reviewed and analyzed the circuit,
23 and I provide some opinions in the '935 proceeding; but
24 in the '936, I don't see that I've expressly -- I don't
25 see the figure there or a reference to it.

1 Q I -- maybe -- in the '936 declaration,
2 Exhibit 2024, I think you do reproduce the figure between
3 paragraphs 257 and 258. Should be around page 97 of the
4 document.

5 A I -- I appreciate the help. I am at, like,
6 357 --

7 Q No, no. Sorry. 257.

8 A 257. Okay. Oh, thank you.

9 Yes, I think it's the same or a similar section
10 as the '935, but we're staying on the '936. I -- I see
11 the figure that is there.

12 Q Okay. And yeah. Just to be clear, we're in
13 your declaration in the '936, but I realize that -- I
14 believe the same section is basically in both.

15 A Right.

16 Q Okay. In Figure 3, there's this -- I think it's
17 described as a flip-flop structure sort of in the middle
18 of the figure, where two transistors have the sort of X
19 shape going into their gates.

20 Do you see that?

21 A I do see Razavi talking about the master-slave
22 flip-flop, M3, M4, M5, M6. And I do see M3, M4, and M5
23 and M6 there in Figure 3.

24 Q Okay. For instance, if we're looking at M4, the
25 node directly above that, there, there are two

1 transistors that have their gates depicted as crossing in
2 an X. I understand they're not actually connected there,
3 but they're depicted that way.

4 Do you see what I'm --

5 A Yes, I do.

6 Q Okay. What's that portion of the divider
7 circuit where those two transistors are crossed?

8 A So the -- Razavi describes these as master-slave
9 flip-flop. And so flip-flops are -- have latches in
10 them. And so the cross-coupled is a -- is a latch. So
11 you can set one side being low, the other side being
12 high, or vice versa, and it will hold it there until you
13 actively reset it or set it to a different output.

14 Q Okay. And the output of that latch goes to ILO;
15 correct?

16 A I, as in in-phase; LO as in local oscillator.
17 That's correct.

18 Q Okay. And a similar latch just above M6 is
19 labeled as going to QLO; correct?

20 A Q, as in quadrature; LO as in local oscillator,
21 yes.

22 Q Okay. Okay. And then if we could go up in the
23 same declaration, so staying in your declaration in
24 support of the '936 IPR, there is another section about a
25 prior art reference, Texas Instruments data sheet. I

1 believe it starts at paragraph 234 on page 87.

2 A I do see paragraph 237 is in the section about
3 the Texas Instruments data sheet, SN74CBT3253.

4 Q So I just want to make sure we're both looking
5 at the same documents. It looks like Exhibit 2024 to the
6 '936 IPR, the TI data sheet, should be paragraphs 234,
7 35, and 36; is that right?

8 A Just a moment, please.

9 Q Sure.

10 A That's correct. I sorry if I misspoke. 234,
11 235, 236, yes.

12 Q Okay. And this is a multiplexer/demultiplexer.
13 And if I understand your annotation as described in
14 paragraph 236, the blue squares are FETs, field effect
15 transistors, that are being used as switches inside this
16 device; correct?

17 A That's what I -- that's what's understood from
18 the figure, that these are switches and are being
19 implemented as FETs.

20 Q Okay. And then if we could go down to the
21 section of your declaration on the Macnally prior art
22 reference, which I believe starts on paragraph 267, which
23 is PDF page 102.

24 A All right. At -- yes -- paragraph 267 starts a
25 discussion of Macnally reference.

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1 Q Okay. And there's a Figure 3 just below
2 paragraph 268.

3 Do you see that?

4 A I do see that.

5 Q Okay. And that has a series of transistors
6 labeled M1 through M8 on the left side of the figure.

7 Do you see that?

8 A I do. M1, 2, 5, 6, 7, 8.

9 Q I think there's actually an M3, M4, in the
10 middle of --

11 A You are correct. It has all eight transistors.

12 Q Okay. Okay. And Transistors M5, M6, M7, and M8
13 receive the LO inputs to their gates; correct?

14 A M5 and M8 receive LOP, as in papa; and then M6
15 and M7 receive LON, as in Nancy.

16 Q Okay. And those -- those are FETs; correct?

17 A The symbol that's on the schematic is of a -- of
18 an NFET.

19 Q Okay. Those are being used as switches inside
20 the mixer for Macnally; correct?

21 A I believe your question was what are M5 and M6,
22 their function.

23 Did I understand that correctly?

24 Q Okay. Yeah. Why don't we do that.

25 In Figure 3 of Macnally, what is the function of

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1 Transistors M5 and M6?

2 A M5 and M6 will steer the current that's going
3 through M3. It'll steer it towards the M5 branch when
4 LOP, as in papa, is high; and it'll steer the current to
5 the M6 branch when LON, as in Nancy, is -- is high.

6 Q Okay. And let's just keep it simple.

7 In Figure 3 of Macnally, what is the function of
8 Transistors M7 and M8?

9 A M7, M8, would likewise steer the current that's
10 going through M4. They would steer it towards the M7
11 branch when LON, as in Nancy, was high; and towards the
12 M8 branch when LOP, as in papa, was high.

13 And in these current steering circuits, you
14 know, as the gates change, it smoothly steers from one
15 branch into the other.

16 Q Do you happen to remember what the frequency of
17 the LO in Macnally was?

18 A The embodiments -- I don't -- I don't recall
19 specifically. I believe the Macnally patents describes
20 several frequency operations. Several embodiments are at
21 915 megahertz.

22 Q Okay. And I know we're at about -- I think it's
23 1:00 o'clock Eastern.

24 If you could give me maybe 10 minutes, I can do
25 sort of a quick assessment of where we are and whether it

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1 makes sense to push through or take a lunch break, if
2 that's okay with everybody.

3 A Okay.

4 MS. LEPORE: That's okay with me.

5 THE WITNESS: Thanks.

6 MR. MAGEE: Why don't we take maybe 10 minutes,
7 and I'll get back to you as quick as I can.

8 THE WITNESS: Okay. Thanks.

9 (Recess)

10 MR. MAGEE: Okay. So back on the record.

11 I have no further questions, Dr. Ricketts.

12 THE WITNESS: Thank you.

13 MS. LEPORE: We have no questions for the
14 witness.

15 MR. MAGEE: Great.

16 Do we need to designate the confidentiality of
17 this deposition? We did discuss some of the Eddie chip.

18 MS. LEPORE: I would mark it as highly
19 confidential, outside attorneys' eyes only.

20 For now I'm not sure if there's -- if the
21 protective order specifically applies to the IPR, so
22 we'll mark it like that for now, and if we have to make
23 any changes later on, I'll --

24 MR. MAGEE: That's fine. Just let us know.

25 Dr. Ricketts, thank you so much for your time,

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1 especially on a Friday.

2 THE WITNESS: Thanks, Robert.

3 Thanks, Lindsay.

4 Talk to you guys another time.

5 THE REPORTER: Ms. Lepore, would you like a
6 copy?

7 MS. LEPORE: I'm sorry. What was that?

8 THE REPORTER: Would you like a copy?

9 MS. LEPORE: Yes, please.

10 MR. GRISWOLD: And, Lindsay, do you have all the
11 E-mail addresses you need to send -- I think my paralegal
12 set up the -- the depo, so you certainly have -- you can
13 certainly send the rough to me, and I'll circulate it.

14 THE REPORTER: Okay.

15 MS. LEPORE: I don't know if you have mine, but
16 I'll put it in the chat now.

17 THE REPORTER: Thanks.

18 Are we ready to go off the record?

19 MR. MAGEE: Yes, we can be off the record.

20 MS. LEPORE: Yes.

21 (The proceedings concluded at 10:12 a.m.)

22 ***

23

24

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REPORTER'S CERTIFICATE

I, LINDSAY JAGICH, a Certified Shorthand Reporter
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That the foregoing proceedings were taken before
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witnesses in the foregoing proceedings, prior to
testifying, were administered an oath; that a record of
the proceedings was made by me using machine shorthand
which was thereafter transcribed under my direction; that
the foregoing transcript is a true record of the
testimony given.

Further, that if the foregoing pertains to the
original transcript of a deposition in a federal case,
before completion of the proceedings, review of the
transcript was not requested.

I further certify I am neither financially
interested in the action nor a relative or employee of
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IN WITNESS WHEREOF, I have this date subscribed
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