

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC

Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,

Patent Owner.

CASE IPR2025-00180

Patent 11,785,275

DEPOSITION OF SAMUEL H. RUSS, PH.D.

Friday, October 17, 2025

Reported By: Joanna B. Brown, CSR, RPR, CRR, RMR
CSR No. 8570

1 UNITED STATES PATENT AND TRADEMARK OFFICE
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4 COMCAST CABLE COMMUNICATIONS, LLC

5 Petitioner,

6 v.

7 ENTROPIC COMMUNICATIONS, LLC,

8 Patent Owner.

9
10 CASE IPR2025-00180

11 Patent 11,785,275
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13
14

15 Deposition of SAMUEL H. RUSS, PH.D., taken on
16 behalf of the Petitioner, at 1016 Pico Boulevard,
17 Santa Monica, California, beginning at 8:50 a.m. and
18 ending at 3:11 p.m., on Friday, October 17, 2025,
19 before JOANNA B. BROWN, Certified Shorthand Reporter
20 No. 8570, RPR, CRR, RMR.
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25

1 A P P E A R A N C E S

2 FOR THE PETITIONER:

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6

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I N D E X

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PREVIOUSLY MARKED EXHIBITS

PETITIONER'S	PAGE
Exhibit 1001 United States Patent	10
No. US 11,785,272 B2	
Exhibit 2013 Declaration of Samuel H. Russ,	14
Ph.D.	
Exhibit 1086 United States Frequency	42
Allocations, The Radio Spectrum	
Exhibit 1013 United States Patent Application	131
Publication US 2003/0056221 A1	

UNANSWERED QUESTIONS

PAGE LINE
(None.)

1 Santa Monica, California; Friday, October 17, 2025

2 8:50 a.m.

3

4 (SAMUEL H. RUSS, PH.D.,

5 deponent, was sworn and examined

6 and testified as follows:)

7

8 (Let it be known that Samuel H. Russ, Ph.D.,

9 appeared before me on Friday, October 17, 2025, at

10 1016 Pico Boulevard, Santa Monica, California.

11 Craig W. Kronenthal, Esq., and Parham Hendifar, Esq.,

12 also appeared before me, and the following record was

13 made.)

14 THE REPORTER: My name is Joanna Brown, and

15 my CSR number is 8570.

16 Would you raise your right hand, please.

17 You do solemnly state, under penalty of

18 perjury, that the evidence you shall give in this

19 matter will be the truth, the whole truth, and nothing

20 but the truth?

21 THE WITNESS: I do.

22 THE REPORTER: Thank you.

23 EXAMINATION

24 BY MR. KRONENTHAL:

25 Q Good morning, Dr. Russ. I'm Craig Kronenthal

1 from Banner Witcoff, and I'm representing Petitioner
2 Comcast Cable Communications, LLC. Dr. Russ, please
3 state your name and address for the record.

4 A My name is Samuel Hardie, H-a-r-d-i-e, Russ,
5 and my address is 13712 Tom Gaston Road, Mobile,
6 Alabama.

7 Q Thank you. And you understand we are here
8 today to question you because you submitted a
9 declaration in support of Entropic's patent response
10 in IPR for U.S. Patent No. 11,785,275; correct?

11 A Correct.

12 Q And the case number for this proceeding or
13 this IPR of the '275 patent is IPR2025-00180. If I
14 refer to "this proceeding" or "this IPR" or "this
15 case," will you understand that I'm referring to
16 IPR2025-00180?

17 A Yes.

18 Q Thank you. Have you ever been deposed before?

19 A Yes, I have.

20 Q And about how many times?

21 A Probably 30 or 40 times now.

22 Q And you understand that you are under oath for
23 the entirety of today's deposition; correct?

24 A Yes.

25 Q Is there anything that would prevent you from

1 providing truthful or accurate testimony today?

2 A Not that I'm aware of.

3 Q And if I say anything that confuses you, will
4 you please say so?

5 A Yes.

6 Q And unless you tell me otherwise, you agree
7 that it's fair to assume that you understood my
8 question?

9 A Yes.

10 Q And you agree to provide verbal answers and
11 not answers by merely shaking or nodding your head?

12 A Yes.

13 Q You also understand that if your attorney
14 objects to the form of the question, you are still
15 required to answer my question; correct?

16 A Yes.

17 Q So as long as your attorney simply objects to
18 the form and refrains from speaking objections, then
19 I'll just await for your answer. Okay?

20 A Okay.

21 Q We'll plan to take several breaks, but if you
22 need a break, just please let me know.

23 A Sure.

24 MR. HENDIFAR: That's all?

25 ///

1 BY MR. KRONENTHAL:

2 Q My only question -- or my only request is that
3 if I have a question pending, that I ask you to answer
4 that question before we go on a break.

5 A Sure.

6 Q Is that all right?

7 A Yes.

8 Q And you are -- you understand that you are not
9 to discuss this case with your attorney until the
10 deposition is over; is that correct?

11 A Yes, I understand that.

12 Q What did you do to prepare for this deposition
13 today?

14 A I read my declaration. I read some of the
15 references that are associated with this case. I
16 reviewed the full written decisions, and I met with
17 counsel. I should say the final written decisions and
18 other similar IPR matters, and I met with counsel.

19 Q What references did you review?

20 A Well, the Zhang reference and the '275 patent
21 itself.

22 Q Any other references?

23 A Maybe. I don't recall at the moment.

24 Q And you said you reviewed the final written
25 decisions for other similar IPR matters. Are you

1 referring to the final written decisions for the
2 related '362, '866, and '206 patents?

3 A That's right.

4 Q And who did you meet with to review for this
5 deposition?

6 A Counselor sitting here today.

7 Q And how long did you meet for?

8 A A few hours.

9 Q Four hours? Less, give or take?

10 A Six or seven hours, I think.

11 Q And you have some documents in front of you.

12 A Yes, I do.

13 Q Okay. Are these clean copies, or do you have
14 any handwriting or highlighting on these copies?

15 A As far as I know, they are clean copies.

16 MR. HENDIFAR: We prepared them. They are
17 clean copies.

18 BY MR. KRONENTHAL:

19 Q And what documents are those?

20 A Let's see. It's my declaration. It's the
21 petition. I'm sorry. The staples are sticking
22 together. This is a final written decision for the
23 '362. This is the '275 patent, the Zhang reference,
24 which is a patent application. This is the '866
25 patent, which is in the same family, the '275. This

1 looks like some sort of office action, Europe. This is
2 related to an office action in Europe. This is another
3 European office-action document, my CV. This appears
4 to be the Zhang patent. This is a notice of allowance.
5 It's an information disclosure statement, final written
6 decision for the '866 patent, and the final written
7 decision for the '206 patent, and those are the
8 documents I have in front of me.

9 Q Okay. Thank you. So you mentioned -- if you
10 could, pull up the '275 patent.

11 A Okay.

12 Q I also have copies if you'd like, but --

13 A Okay. Thank you.

14 MR. KRONENTHAL: Would you like a copy?

15 MR. HENDIFAR: I've seen it. Thank you.

16 (Deposition Exhibit 1001 was previously
17 marked and is attached hereto.)

18 BY MR. KRONENTHAL:

19 Q Is your copy of the '275 patent marked at the
20 bottom right-hand corner as Exhibit 1001?

21 A Yes.

22 Q And you recognize this Exhibit 1001 as the
23 subject patent in this proceeding; correct?

24 A Yes.

25 Q If I refer to the '275 patent during this

1 deposition, will you understand that I'm referring to
2 U.S. Patent No. 11,785,275, which is Exhibit 1001 in
3 this proceeding?

4 A Yes.

5 Q And the '275 patent is related to the '362,
6 '866, and '206 patents that you previously reviewed for
7 preparing declarations and IPRs or those patents;
8 correct?

9 A Yes.

10 Q About how many cases have you served as an
11 expert in?

12 A It's listed in my CV, but I would estimate
13 around 30 to 50.

14 Q How many cases have you served as an expert in
15 representing Entropic?

16 A Let's see. This IPR.

17 MR. HENDIFAR: I advise the witness, to the
18 extent you have advised Entropic in a district court
19 case where you have not been publicly identified as a
20 witness, that would be confidential and privileged, and
21 you wouldn't disclose that.

22 THE WITNESS: Okay. I filed a report in
23 connection with a litigation case, and I've been
24 serving in various IPRs with Entropic.

25 ///

1 BY MR. KRONENTHAL:

2 Q So, for a number of proceedings, how many
3 number of proceedings have you represented Entropic?

4 A Let's see. To be clear, are you counting each
5 IPR as a separate proceeding?

6 Q Yes.

7 A Okay. So this is currently, if I'm not wrong,
8 the fourth IPR associated with this particular
9 specification. Is that -- that's correct; right?

10 This is the fourth?

11 Q Yes, for this.

12 A Yeah. Okay. There are -- there's another
13 Entropic IPR that I did. I don't recall the patent at
14 the moment. And then, in the litigation, it's with --
15 it's the litigation involving -- my recollection is
16 DirecTV and Dish.

17 Q Okay. Thank you. How much have you billed
18 Entropic in the past year?

19 A I really don't remember. It's spread across
20 three different law firms. I don't know the dollar
21 amount.

22 Q Would you say it's greater than \$100,000?

23 A No.

24 Q How much have you billed Entropic for your
25 work in this proceeding?

1 A Again, I don't know. It's spread out over
2 four different IPRs over several years. Tens of
3 thousands of dollars would be my guess.

4 Q How much per hour do you charge Entropic for
5 your services?

6 A In the IPRs, it's \$450 an hour, and in the
7 litigation, it's \$600 an hour.

8 Q And has that rate changed since you've started
9 working with Entropic?

10 A I don't think so.

11 Q How much time did you spend preparing your
12 declaration in this proceeding?

13 A A few hours to a few dozen hours. I'm not
14 sure.

15 Q Do you think you spent less than ten hours
16 preparing your declaration in this proceeding?

17 A No. I think it's more than ten hours. So I
18 would say a few dozen hours.

19 Q Do you think you spent more than 20 hours
20 preparing your declaration?

21 A I don't know.

22 Q You mentioned you already have a copy of your
23 declaration; correct?

24 A Yes.

25 Q If you could, pull that out. Oh, they are

1 there. Great. And is that declaration marked as
2 Exhibit 2013 in the bottom right-hand corner? Or,
3 actually, yours might be marked in the middle.

4 A It's marked on the cover page.

5 (Deposition Exhibit 2013 was previously
6 marked, a copy of which is attached hereto.)

7 BY MR. KRONENTHAL:

8 Q Okay. And I assume it is a true and complete
9 copy of your declaration; is that correct?

10 A Yes. As far as I know it is, yes.

11 Q Could you turn to page 45, the last page, I
12 believe.

13 A Yes.

14 Q And is that your signature on there?

15 A Yes.

16 Q If I refer to your declaration, will you
17 understand that I'm referring to the declaration that
18 you have that is marked Exhibit 2013?

19 A Yes.

20 Q Thank you. How would you describe the process
21 of preparing your declaration?

22 A I -- the high-level outline was provided by
23 counsel, and the "Applicable Legal Standards" section
24 was, I think, pretty clearly drafted by counsel. I put
25 in, like, a first draft and then edited it in concert

1 with counsel.

2 Q And so the initial draft would be a high-level
3 outline provided by counsel; is that correct?

4 A Yeah. And by "high-level," I mean, like,
5 "Introduction," "Qualifications," you know, and then,
6 like I said, counsel drafted the "Legal Standards."

7 Q And what about the analysis section?

8 A I worked on that with counsel. We, you know,
9 worked on it together.

10 Q Did counsel provide an initial draft of the
11 analysis sections?

12 A Not that I recall.

13 Q What percentage of the declaration do you
14 think you wrote?

15 A Well, my recollection is the substance of the
16 analysis section, but -- yeah. So I -- so I -- a very
17 high percentage. And importantly, although, you know,
18 obviously -- well, let me back up.

19 Obviously, counsel and I worked together on
20 this. I know, in IPRs, the declarations and the other
21 filings have to line up, and so there's a lot of --
22 there's unusually close connection between this
23 declaration and other reports in this case. With that
24 said, every single word in this declaration, I am
25 putting forth as my own opinion.

1 Q When did you begin preparing your declaration
2 for this proceeding?

3 A Let's see. I see that it was filed in August.
4 So I -- my offhand recollection is it would have been
5 in spring or summer of this year.

6 Q And your declaration in this IPR is very
7 similar to your declarations in the IPRs for the '362,
8 '866, and '206 patents; correct?

9 A That's correct.

10 Q That's because the claims in the '275 patent
11 are very similar to the claims in the previous patents;
12 correct?

13 MR. HENDIFAR: Object to the form.

14 THE WITNESS: I would say it's because these
15 patents share common specifications, and for that
16 reason, the claims are drawn to the same
17 specifications. So there's a natural overlap there.

18 BY MR. KRONENTHAL:

19 Q And the issues in this IPR are the same as
20 those in the previous IPRs; correct?

21 MR. HENDIFAR: Objection. Form.

22 THE WITNESS: I mean, there is some overlap in
23 the issues. Importantly, you know, no two claims have
24 the same wording. So there's definitely differences in
25 the arguments that are being made here from others,

1 which is naturally the result of different claim
2 language. So it's unique in that sense. There is,
3 obviously, a lot of overlap with the others because,
4 again, they are all drawn to the same specification.

5 BY MR. KRONENTHAL:

6 Q Did you find any errors in your declaration?

7 A Not -- no.

8 Q Could you turn to paragraph 5 of your
9 declaration.

10 A Okay.

11 Q In paragraph 5 of your declaration, you wrote
12 about midway through: "My professional career has been
13 dedicated to issues related to signal integrity,
14 communication systems, and home networking more
15 generally"; correct?

16 A Correct.

17 Q And, actually, above that, you wrote: "As
18 explained below, I have authored a reference textbook
19 on signal processing, authored or co-authored 32
20 journal articles and conference papers in the areas
21 of video storage, video networking and consumer
22 electronics"; correct?

23 A That's what the sentence says. Actually, I
24 think a better way to put the textbook is a reference
25 textbook on signal integrity.

1 Q And that was an error you made in your
2 previous declarations; correct?

3 A I don't recall. And I wouldn't say that's an
4 error. I'm saying that's a clarification.

5 Q Could we turn to paragraph 13 of your
6 declaration.

7 A Okay.

8 Q In paragraph 13 of the declaration, you list
9 materials that you reviewed to form your opinions;
10 correct?

11 A Yes.

12 Q Did you review any other materials aside from
13 those listed?

14 A Not that I recall.

15 Q Did you review any dictionaries to obtain the
16 meaning of any terms?

17 A If I did, it would be in this report.

18 Q Do you recall reviewing the Claxton reference,
19 which is U.S. Patent No. 6,735,421, cited by the
20 U.S. Patent Office examiner in the notice of allowance?

21 A I don't specifically recall if I did or not.

22 Q Would you turn to paragraph 44 of your
23 declaration. Paragraph 44 includes a block quote;
24 correct?

25 A Yes.

1 Q And midway through that block quote, it
2 references a "Claxton et al. US 6,735,421"; correct?

3 A Yes. I see that on the page.

4 Q Did you review that reference?

5 A I don't recall if I did or not.

6 Q Did you review the D1 and D2 references cited
7 in the European prosecution history that you
8 referenced?

9 A I don't recall if I did or not.

10 Q Would you turn to paragraph 59 of your
11 declaration. In paragraph 59, it includes a block
12 quote; correct?

13 A Yes.

14 Q And about midway through that block quote, it
15 refers to a reference D1 and reference D2; correct?

16 A Correct.

17 Q Do you recall whether you reviewed those
18 references?

19 A I don't recall at the moment whether I did or
20 not.

21 Q Would you please turn to paragraph 14 of your
22 declaration.

23 A Okay.

24 Q And in paragraph 14, you assume that the '275
25 patent is entitled to the date of its earliest priority

1 claim; correct?

2 A Well, see, what I understand is, here, assumed
3 to be the effective filing date April 17th, 2009,
4 provisional application from which the '275 patent
5 issued. Yes.

6 Q Okay. So you used April 17, 2009, for your
7 date of the POSITA's knowledge; correct?

8 A Yes.

9 Q And in paragraph 15 of your declaration, you
10 list factors for assessing the level of the ordinary
11 skill in the art; correct?

12 A Yes.

13 Q What do you consider to be the types of
14 problems encountered in the art?

15 A You mean in connection with this case?

16 Q Yes.

17 A Okay. Well, the types of problems would be
18 the types of problems one would encounter when
19 designing a tuner system as shown, for example, in
20 Figure 2 of the patent -- of the '275 patent.

21 Q And what types of problems would a designer
22 encounter when designing the tuner system?

23 A You know, how -- issues like how to design a
24 radio front end such as a radio front end 210, how to
25 design a digital front end such as a digital front end

1 230.

2 Q And what considerations would go into
3 determining how to design the radio front end?

4 MR. HENDIFAR: Objection. Form.

5 THE WITNESS: Well, I mean, it's just as I
6 said, issues with how to design a radio front end and a
7 digital front end in general.

8 BY MR. KRONENTHAL:

9 Q Would you agree that the power consumption of
10 the radio front end is something that a designer of the
11 radio front end takes into consideration?

12 MR. HENDIFAR: Objection. Form.

13 THE WITNESS: Perhaps.

14 BY MR. KRONENTHAL:

15 Q Is the limited space in the box a
16 consideration when designing the radio front end?

17 MR. HENDIFAR: Objection to form.

18 THE WITNESS: It might be.

19 BY MR. KRONENTHAL:

20 Q In paragraph 16 of your declaration, you
21 identify Mr. Lett's definition for the person of
22 ordinary skill in the art; correct?

23 A Correct.

24 Q And in paragraph 17, you stated that you
25 applied Mr. Lett's definition for the person of

1 ordinary skill in the art; correct?

2 A Yes.

3 Q You did not offer your own definition for the
4 person of ordinary skill in the art; correct?

5 A Right. I supplied Mr. Lett's proposed
6 qualifications, and then my opinions are valid even if
7 the board adopts a slightly different level of ordinary
8 skill in the art, explained that also in paragraph 18.

9 Q Yes. Thank you. So I'd like to agree on some
10 nomenclature for today. If I refer to a "person of
11 ordinary skill in the art" or the "POSITA" for the '275
12 patent at this time, do you understand that I'm
13 referring to the POSITA under the definition in
14 paragraph 17 that you adopted?

15 A Yes.

16 Q Thank you. Would you turn to paragraphs 9 and
17 10 of your declaration.

18 A Okay.

19 Q In paragraphs 9 and 10 of your declaration,
20 you discuss your industry experience at
21 Scientific Atlanta; correct?

22 A Yes.

23 Q And you relied on that experience for your
24 qualifications to provide opinions in this proceeding;
25 correct?

1 A Among other things, yes.

2 Q And while at Scientific Atlanta, you worked on
3 set-top boxes; correct?

4 A That is correct.

5 Q You would agree that the costs of the set-top
6 boxes was an important consideration in designing the
7 set-top boxes; correct?

8 A That is correct.

9 Q Scientific Atlanta was selling millions of
10 set-top boxes; correct?

11 MR. HENDIFAR: Objection. Form. Foundation.
12 And to the extent, that may be a privileged
13 communication of Scientific Atlanta.

14 MR. KRONENTHAL: Actually, I think it's in
15 your paragraph 9.

16 MR. HENDIFAR: Then I apologize. I don't know
17 what is confidential and what is not at
18 Scientific Atlanta.

19 THE WITNESS: Quoting from paragraph 9, "Both
20 models were produced in high volumes and sold several
21 million units."

22 BY MR. KRONENTHAL:

23 Q So Scientific Atlanta would have been
24 sensitive to the costs of the circuitry that was put
25 into the set-top boxes; correct?

1 THE REPORTER: I lost your question, and then
2 can I take a break?

3 MR. KRONENTHAL: Let's go off the record.

4 (Off the record.)

5 BY MR. KRONENTHAL:

6 Q Scientific Atlanta would have been sensitive
7 to the costs of circuitry that was put into its set-top
8 boxes; correct?

9 A Yes. Correct.

10 MR. HENDIFAR: Are we back on the record?

11 THE WITNESS: Yes.

12 MR. KRONENTHAL: Yes.

13 BY MR. KRONENTHAL:

14 Q Scientific Atlanta would have wanted to reduce
15 costs of its set-top boxes by omitting unnecessary
16 circuitry; correct?

17 A Correct.

18 Q The set-top boxes you worked on were capable
19 of receiving over 100 television channels; correct?

20 MR. HENDIFAR: Objection to form.

21 THE WITNESS: There were over 100 channels on
22 the input, but they were each only capable of selecting
23 one or two channels at a time.

24 And I take it back. Let me make sure I
25 understand your question, Counselor. When you say

1 "channel," what are you referring to?

2 BY MR. KRONENTHAL:

3 Q So my question was specifically about
4 television channels.

5 So the set-top boxes you worked on were
6 capable of receiving over 100 television channels;
7 correct?

8 A Are you talking about RF channels or
9 individual television networks?

10 Q The individual television network channels.

11 A So, in other words, like, CNN and Golf Channel
12 would be two different channels?

13 Q Correct.

14 A Yes. Hundreds of television network channels,
15 yes.

16 Q And you would agree that there are dozens of
17 RF channels carrying those hundreds of television
18 channels; correct?

19 A Yes. My recollection is there were about a
20 120 RF channels carrying those television channels.

21 Q And the set-top boxes you worked on did not
22 simultaneously output all hundred-plus television
23 channels; correct?

24 A They -- the boxes that I worked on would have
25 selected a small number, two, three, or four, maybe six

1 channels -- television network channels.

2 Q You agree that there is no need for a set-top
3 box to simultaneously output over 100 television
4 channels; correct?

5 MR. HENDIFAR: Objection. Form.

6 THE WITNESS: No. I mean, there's --
7 Scientific Atlanta worked on a specific type for
8 somebody's home, but there are other types of devices
9 out there that output different things. I don't think
10 you can say that generally.

11 BY MR. KRONENTHAL:

12 Q You agree that the set-top boxes that you
13 worked on for Scientific Atlanta did not simultaneously
14 output over 100 television channels, though; correct?

15 A The ones I worked on did not. That is
16 correct. And, again, we are talking about television
17 network channels, not RF channels.

18 Q You would also agree that the set-top boxes
19 you worked on did not simultaneously output hundreds of
20 RF channels; correct?

21 A That is correct.

22 Q The set-top boxes you worked on did not have
23 more than a few tuners; correct?

24 MR. HENDIFAR: Object to the form.

25 THE WITNESS: That is correct.

1 BY MR. KRONENTHAL:

2 Q In fact, the set-top boxes you worked on had
3 less than five tuners; correct?

4 A Let me think about that. The 8300 had two
5 video tuners, one DOCSIS tuner. Yes, I think that's
6 correct.

7 Q So the set-top boxes you worked on used a few
8 tuners to simultaneously tune to a few desired
9 channels; correct?

10 A I don't understand your question. What do you
11 mean by "desired"? That's a claim term. So I'm
12 curious, are you using "desired" the way it is used in
13 the claims?

14 Q Yes.

15 A And then, since you are asking the question,
16 how do you define that term?

17 Q Would a desired channel be a channel that a
18 user wants to watch?

19 A Are you asking in connection with this other
20 '275 patent --

21 Q Yes.

22 A -- or are you asking in general?

23 Q In connection with the '275 patent.

24 A Well, it's clear in the '275 patent that the
25 desired channel is a channel that is ultimately passed

1 to a demodulator.

2 Q And that's so that a user could watch the
3 channel; correct?

4 A Well, actually, let's turn to the '275 patent
5 to Column 1, line 55 -- starting at line 55. "In
6 certain applications such as DVR and
7 picture-in-picture, the receiver system may have to
8 concurrently receive several desired channels that may
9 or may not be contiguous."

10 So, for example, a channel that is being sent
11 to a DVR such as being -- that is being recorded on a
12 DVR is described here as being a "desired channel."

13 So there are channels that are being watched,
14 and there are channels that are being recorded; but in
15 every case, they are being passed to a demodulator,
16 which is why I believe that's the correct definition.

17 Q Okay. So if a desired channel includes a
18 channel that is being watched or recorded, you would
19 agree that the set-top boxes you worked on used a few
20 tuners to simultaneously tune to a few desired
21 channels; correct?

22 A Yes. If, by "desired channel," you mean one
23 that is ultimately passed to the demodulator, that is
24 correct.

25 Q Thank you. The set-top boxes you worked on

1 did not have a tuner for every channel received by the
2 set-top box; correct?

3 A I'm a little confused because tuners -- tuners
4 work on RF channels, not on television programming
5 channels. So I guess I don't understand your question.

6 Q So you agree that the set-top boxes you worked
7 on received dozens of RF channels; correct?

8 A That is correct.

9 Q And you agree that the set-top boxes did not
10 have dozens of tuners; correct?

11 A That is correct, not the ones that I worked
12 on. That is correct.

13 Q Are you aware of any set-top box with dozens
14 of tuners?

15 A Now, the issue there -- let me back up.
16 What do you mean by "tuner"?

17 Q We are talking about RF channel tuners;
18 correct?

19 A Yes. That doesn't give me enough information
20 to answer the question.

21 Q When I asked earlier that the set-top boxes
22 you worked on had less than five tuners, you answered
23 "Correct"; is that right?

24 A Yes, because they had a very specific type of
25 tuner.

1 Q Is it that your struggle with the question
2 is -- would a video tuner make it clear for you?

3 A No.

4 Q Are you familiar with a video tuner?

5 A Yes. Again, an example of a video tuner would
6 have been the tuner in the set-top boxes that I
7 designed.

8 Q Okay. So, then, you are not aware of any
9 set-top box that had a video tuner for every television
10 channel that was received at its input; correct?

11 A If you are talking about set-top boxes that
12 have come along after the set-top boxes I designed, I
13 don't have enough information to answer your question.

14 Q But, for the set-top boxes you designed,
15 that's correct?

16 A Counselor, please repeat the question.

17 Q You are not aware of any set-top box that you
18 designed that had a video tuner for every television
19 channel that was received at its input; correct?

20 A Yes. For the set-top boxes that I designed,
21 that is correct.

22 Q Scientific Atlanta was a supplier of set-top
23 boxes for Time Warner; correct?

24 A Yes. Among other customers, yes.

25 Q Scientific Atlanta was also a supplier of

1 set-top boxes for CableVision; correct?

2 A Yes, among others.

3 Q And the set-top boxes you worked on at
4 Scientific Atlanta were for Time Warner and
5 CableVision; correct?

6 A Among other customers, yes.

7 Q And Time Warner and CableVision each had their
8 own cable network in the early 2000s; correct?

9 A They each had numerous cable networks in the
10 early 2000s; that is correct.

11 Q Their cable networks were separate from one
12 another; correct?

13 A Yes. And even in Time Warner -- well,
14 actually, the cable network is normally something that
15 spans a city. So they both had dozens of cable
16 networks.

17 Q Thank you. Time Warner would have supplied
18 over 100 television channels in the early 2000s;
19 correct?

20 A Again, if you are talking about television
21 video channels -- or television network channels, that
22 is correct.

23 Q And CableVision would have supplied over a
24 hundred video television channels in the early 2000s;
25 correct?

1 A Television network channels, yes.

2 Q CableVision did not have to supply the same
3 number of television channels as Time Warner; correct?

4 A There's clearly not enforcers in the cable
5 industry that each cable operator make their own
6 decisions about which channels to operate.

7 Q So, for example, CableVision could have
8 supplied 120 channels while Time Warner could have
9 provided 110 channels; correct?

10 THE REPORTER: I'm sorry. Can you repeat
11 that.

12 MR. KRONENTHAL: Sure.

13 BY MR. KRONENTHAL:

14 Q For example, CableVision could have supplied
15 120 channels while Time Warner could have provided only
16 110 channels; correct?

17 MR. HENDIFAR: Object to the form.

18 THE WITNESS: Again, television network
19 channels. Yes, that's correct.

20 BY MR. KRONENTHAL:

21 Q You are not aware of a commercial cable system
22 in the early 2000s that broadcasted only one television
23 channel; correct?

24 A I'm not aware of any. That is correct.

25 Q Different cable network headends would have

1 used different frequencies to deliver television
2 channels through their respective cable networks;
3 correct?

4 MR. HENDIFAR: Object to the form.

5 THE WITNESS: Each local operator made
6 decisions about which frequencies to use based on the
7 needs of their individual network; that is correct.

8 BY MR. KRONENTHAL:

9 Q The signal input to a set-top box from a
10 Time Warner Cable network would have had a different
11 bandwidth than the signal input to a set-top box from a
12 CableVision cable network; correct?

13 MR. HENDIFAR: Object to the form.

14 THE WITNESS: I don't know. I know that my
15 box was designed with a specific bandwidth in mind.

16 BY MR. KRONENTHAL:

17 Q Do you recall what that bandwidth was?

18 A My offhand recollection is that the input
19 spanned from 54 to 860 megahertz.

20 Q And is that the only bandwidth that you
21 designed set-top boxes for?

22 A That's what I recall at the moment.

23 Q And that's -- those same set-top boxes were
24 for both Time Warner and CableVision; correct?

25 A Among other customers, yes. For example, we

1 also sold to Comcast.

2 Q Time Warner and CableVision would have offered
3 a different total number of television channels so the
4 RF signals in Time Warner and CableVision's networks
5 would have different bandwidths; correct?

6 MR. HENDIFAR: Object to the form.

7 THE WITNESS: There's a lot of assumptions in
8 there. I can't -- I don't know. It's possible they
9 had the same bandwidth.

10 BY MR. KRONENTHAL:

11 Q It is also possible they had different
12 bandwidths; correct?

13 A It's possible, yes.

14 Q You don't know for sure one way or the other,
15 though; correct?

16 A Right. I don't know.

17 Q The set-top boxes you worked on at
18 Scientific Atlanta were not specific to a particular
19 cable network operator; correct?

20 A They were designed to work across a variety of
21 operators; correct.

22 Q The set-top boxes you worked on at
23 Scientific Atlanta were not customized for a particular
24 cable network operator; correct?

25 A I think that's correct.

1 Q CableVision and Time Warner were not modifying
2 the set-top boxes that Scientific Atlanta were
3 providing them; correct?

4 MR. HENDIFAR: Object to the form.

5 THE WITNESS: Well, I know that they had the
6 ability to add more RAM if they wanted it, for example.
7 So they might have. I don't know.

8 BY MR. KRONENTHAL:

9 Q CableVision and Time Warner were not modifying
10 the number of tuners in the set-top boxes that you were
11 providing them; correct?

12 MR. HENDIFAR: Objection. Foundation.

13 THE WITNESS: To my knowledge, they were not.

14 BY MR. KRONENTHAL:

15 Q You would agree that the Scientific Atlanta
16 set-top boxes you worked on were flexible to work with
17 different input signals of different bandwidths;
18 correct?

19 MR. HENDIFAR: Object to the form.

20 THE WITNESS: I don't know what you mean by
21 "input signals" and "bandwidths."

22 BY MR. KRONENTHAL:

23 Q So by "input signal," I'm referring to the RF
24 signal coming into the set-top box from, for example, a
25 cable headend. Okay?

1 A Okay.

2 Q And by "bandwidth," I'm referring to the
3 bandwidth of that input signal. Okay?

4 A Okay.

5 Q So you would agree that Scientific Atlanta
6 set-top boxes you worked on were flexible to work with
7 different input signals of different bandwidths;
8 correct?

9 A In the specific case of the set-top boxes that
10 I worked on, yes.

11 Q They were flexible enough to work with
12 lower-frequency bands such as, for example, the very
13 high-frequency band; correct?

14 A They -- back in that era, yes, they would
15 have.

16 Q And the same set-top boxes were flexible
17 enough to work with higher-frequency bands such as in
18 the ultra-high-frequency band; correct?

19 A Yes. Back in that time period, that is
20 correct. And that was to maintain bandwidth and be
21 able to use it in analog, which is not a design
22 consideration today.

23 Q I believe you might have mentioned this
24 already, but you worked on Scientific Atlanta's
25 Explorer 4200; correct?

1 A That is correct, the standard definition.

2 Q The Explorer 4200 had a single video tuner;
3 correct?

4 A Yes, I think that's correct.

5 Q And the Explorer 4200's single video tuner was
6 for tuning to a single 6 megahertz-wide television
7 channel; correct?

8 A A single 6 megahertz-wide RF channel, yes.

9 Q And that single 6 megahertz-wide RF channel
10 would carry television channels; correct?

11 A One or more of -- I think I've been using the
12 term "television network channels" such as the
13 Golf Channel or CNN. That is correct.

14 MR. HENDIFAR: Is now a good time for a break?
15 Whenever is good.

16 MR. KRONENTHAL: Sure. Let's go off the
17 record.

18 (Off the record.)

19 BY MR. KRONENTHAL:

20 Q Dr. Russ, just before the break, we were
21 talking about the Explorer 4200 single video tuner;
22 correct?

23 A Correct.

24 Q And that same single video tuner in the 4200
25 was used to tune into many different television

1 channels on different frequencies; correct?

2 A Correct.

3 Q For example, the Explorer 4200 single tuner
4 would have been tuned to a 6 megahertz-wide RF channel
5 to get one television show and then tune to a different
6 6 megahertz-wide RF channel to get another television
7 show; correct?

8 A Correct.

9 Q And you used the same video tuner for tuning
10 to different portions of the RF spectrum; correct?

11 A Yes.

12 Q The reason for using the same video tuner was
13 to reduce cost; correct?

14 A I would assume so, yes.

15 Q Scientific Atlanta did not put multiple video
16 tuners in the Explorer 4200 because it wanted to reduce
17 costs; correct?

18 A Yes. The box was designed with a single video
19 output. So there was no need to spend money on more
20 tuners.

21 Q The Explorer 4200 video tuner did not tune to
22 television channels that were not selected; correct?

23 MR. HENDIFAR: Object to the form.

24 THE WITNESS: I'm sorry. What do you mean by
25 "selected"?

1 BY MR. KRONENTHAL:

2 Q Selected for output for a recording or
3 watching.

4 A The box had one purpose, which was to drive a
5 television set so that one tuner was set to whatever --
6 right -- whatever was going -- was being output.

7 Q And whatever was being output was based upon a
8 user selection to either record or watch television;
9 correct?

10 A In the case of the 4200, that's correct; or
11 they might have set a timer for recording or something.
12 But it was based on -- in the specific case, the 4200,
13 it was -- right -- it was being output to the
14 demodulator for -- on the basis of what the subscriber
15 wanted. Yes.

16 Q And adding a second video tuner to the
17 Explorer 4200 to tune to channels that were not
18 selected would have been unnecessary; correct?

19 MR. HENDIFAR: Object to the form.

20 THE WITNESS: Adding a second video tuner to
21 tune into a channel that was not being displayed would
22 have been a waste of money; correct.

23 BY MR. KRONENTHAL:

24 Q A POSITA would not have wanted to include a
25 tuner for every channel received by the set-top box

1 because that would have driven up cost of the set-top
2 box; correct?

3 MR. HENDIFAR: Object to the form.

4 THE WITNESS: If by "tuner" you mean the type
5 of tuner that was found in my set-top boxes, yes.

6 BY MR. KRONENTHAL:

7 Q And including a tuner for every channel
8 received by the set-top box would have unnecessarily
9 increased power consumption of the set-top box;
10 correct?

11 MR. HENDIFAR: Object to the form.

12 THE WITNESS: If by "tuner" you mean the type
13 of tuner that were in the boxes that I designed, yes.

14 BY MR. KRONENTHAL:

15 Q A POSITA would have been familiar with the
16 frequent allocations in the United States; correct?

17 A The frequency allocations, I assume, you mean
18 in your television channels -- RF channels for
19 television, yes.

20 Q Yes. And were you familiar with those U.S.
21 frequency allocations?

22 A Yes.

23 Q A POSITA would have known that only certain
24 frequencies were allocated for television broadcasting;
25 correct?

1 MR. HENDIFAR: Object to the form.

2 THE WITNESS: Yes. Now, cable had access to
3 more frequencies than the ones used for over-the-air
4 broadcast, but yes.

5 BY MR. KRONENTHAL:

6 Q And the frequencies allocated for television
7 channels were not contiguous; correct?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: I don't understand your
10 question.

11 BY MR. KRONENTHAL:

12 Q What don't you understand about my question?
13 The "not contiguous" phrase?

14 A Well, for example in the UHF band, the
15 television channels are contiguous.

16 Q All of the different frequencies that were
17 used for television channels, those frequencies were
18 not contiguous; correct?

19 MR. HENDIFAR: Object to the form.

20 THE WITNESS: If by "television" you mean
21 broadcast television. Over-the-air terrestrial
22 broadcast television in North America is carried in
23 three different noncontiguous bands, but the television
24 channels in those bands are contiguous.

25 ///

1 BY MR. KRONENTHAL:

2 Q Yeah. So you agree that the RF television
3 channels are noncontiguous; correct?

4 MR. HENDIFAR: Object to the form.

5 THE WITNESS: In North American broadcast
6 over-the-air television, they are carried in three
7 noncontiguous bands, but the RF channels in each of
8 those bands are contiguous.

9 MR. KRONENTHAL: Okay. I'm going to hand you
10 an exhibit. I'm going to hand you an exhibit, which
11 I'll ask the court reporter to mark and identify this
12 as Exhibit 1086. It's already premarked down in the
13 bottom right. There you go.

14 (Deposition Exhibit 1086 was previously
15 marked for identification and is attached
16 hereto.)

17 BY MR. KRONENTHAL:

18 Q Have you seen this chart before?

19 A I have. I actually use this chart with my
20 students. Yes, I've seen it many times.

21 Q Okay. Do you see the label at the bottom,
22 right-hand corner Comcast Exhibit 1086?

23 A Yes.

24 Q Are you familiar with this chart?

25 A Yes. It's the allocation of the radio

1 spectrum for over-the-air transmissions in the U.S.

2 Q And do you see, in the bottom left, it's small
3 font, but it says "October 2003"?

4 A Yes.

5 Q Would you have been familiar with this chart
6 in October of 2003?

7 A I would have been familiar with the substance
8 of this chart in 2003, yes.

9 Q This chart would have been publicly available
10 in around October 2003; correct?

11 A I think so. It's labeled "U.S. DEPARTMENT OF
12 COMMERCE," which makes me think it's a public document.
13 Yes.

14 Q And your colleagues at Scientific Atlanta
15 would have been familiar with this chart; correct?

16 A I believe so, yes.

17 Q And your colleagues would have been able to
18 locate this chart; correct?

19 A I assume so, yes.

20 Q Can you describe what the chart shows.

21 A Sure. This is a chart of radio spectrum; and
22 importantly, again, this is for broadcast-over-the-air
23 radio, which is different than cable. But, over the
24 air, every frequency range is managed by the U.S.
25 government because there's only a limited number of

1 frequencies that are available, and so over the years,
2 they've been chopped up. Bands or frequencies have
3 been chopped up for different purposes.

4 Q Thank you. And so you mentioned it's for the
5 radio spectrum, and that would cover from 3
6 kilohertz -- we see that at the top left -- all the way
7 to 300 gigahertz on the bottom right; correct?

8 A Correct.

9 Q And they broke that full radio spectrum up
10 into seven different rows; correct?

11 A Correct. In this chart, there are seven
12 different rows. That is correct.

13 Q And the top or first row shows the allocations
14 from 300 kilohertz to 300 -- I'm sorry. I misspoke.
15 Strike that.

16 At the top, the first row shows allocations
17 from 3 kilohertz to 300 kilohertz; correct?

18 A That is correct.

19 Q And the second row from the top shows the
20 allocations from 300 kilohertz to 3 megahertz; correct?

21 A Correct.

22 Q And the third row shows the allocations from
23 3 megahertz to 30 megahertz; correct?

24 A That is correct.

25 Q And the fourth row shows the allocations from

1 30 megahertz to 300 megahertz; correct?

2 A Correct.

3 Q On the left side, there's a "RADIO SERVICES
4 COLOR LEGEND." Do you see that?

5 A I do.

6 Q And this shows the colors associated with the
7 various services that are available using RF channels
8 on the radio spectrum; correct?

9 A For over-the-air transmissions of radio
10 signals, that is correct.

11 Q Okay. And since this font was small, since
12 it's printed on letter size, we've shown several
13 portions of this chart on the following pages.

14 A Yes.

15 Q So, if you could, turn to page 2.

16 A That is much appreciated. All right.

17 Q And page 2 shows a portion of the fourth row
18 of the spectrum from about 50 megahertz to
19 117 megahertz; correct?

20 A Correct.

21 Q You can see that fine?

22 A Yes.

23 Q And it shows that the frequencies between
24 54 megahertz and 72 megahertz are allocated for TV
25 Channels 2 through 4; correct?

1 A Broadcasting over the air terrestrially, yes.

2 Q And in the U.S., an RF channel for television
3 is 6 megahertz; correct?

4 A Yes.

5 Q Now, a POSITA would understand that TV
6 Channel 2 is the RF channel from 54 megahertz to
7 60 megahertz; correct?

8 A Correct.

9 Q And TV Channel 3 is an RF channel from
10 60 megahertz to 66 megahertz; correct?

11 A Correct. Over the air in the U.S., that is
12 correct.

13 Q And TV Channel 4 is an RF channel from
14 66 megahertz to 72 megahertz; correct?

15 A Correct.

16 Q So those three channels cover the 54 to
17 72 megahertz?

18 A Right. They are contiguous in the range 54 to
19 72 megahertz. That is correct.

20 Q And the portion on page 2 also shows that
21 frequencies between 76 megahertz and 88 megahertz are
22 allocated for TV Channels 5 through 6; correct?

23 A Correct. Again, for over-the-air broadcasts
24 in the U.S. -- I should say in North America -- that is
25 correct.

1 Q The RF channels between 72 megahertz and
2 76 megahertz are allocated for uses other than
3 television broadcasting; correct?

4 A Again, terrestrially over the air, yes, that
5 is correct.

6 Q TV Channels 2 through 4 and 5 through 6 are
7 noncontiguous; correct?

8 A They are. Now, TV Channels 2, 3, and 4 are
9 contiguous. TV Channels 5 and 6 are contiguous, but
10 there's a gap between 4 and 5; that is correct.

11 Q And after TV Channels 5 through 6, RF channels
12 in the band between 88 megahertz and 108 megahertz are
13 used for FM radio; correct?

14 A For terrestrial, over-the-air broadcasting,
15 that is correct.

16 Q Those are the channels that you tune to with
17 your car stereo; correct?

18 A If you are listening to FM radio, yes.

19 Q And after the FM radio channels, there's a
20 brown-colored band from 108 megahertz to 117.975
21 megahertz; correct?

22 A That is correct.

23 Q What are the RF channels in that band used
24 for?

25 A Over the air, over an antenna, they are used

1 for aeronautical radio navigation.

2 Q A television receiver for the demodulating
3 television channels would not want to demodulate the
4 RF channels in the aeronautical radio navigation band;
5 correct?

6 A I don't understand your question.

7 Q What don't you understand?

8 A This putative -- you said a television
9 receiver?

10 Q Correct.

11 A Are you talking about a television that's
12 disconnected through an antenna or a television that's
13 connected to a coaxial cable?

14 Q Let's start with a television connected to an
15 antenna.

16 A You would not need to tune that band.

17 Q And you would not want to tune to that band;
18 correct?

19 A If you are connected to an antenna, there
20 would be no need to connect to that band.

21 Q You agree that the '275 patent television
22 receiver includes a television receiver connected to an
23 antenna to receive RF channels; correct?

24 A The way that I would explain it is that is one
25 option, that it be connected to an antenna or -- well,

1 I'm sorry. Let me -- let's look at the '275 patent.

2 Let me look at that.

3 Q Sure. I think it would, I think, speed this
4 along by looking at Claim 1 of the '275 patent.

5 A Okay.

6 Q Claim 1 of the '275 patent, the first line is
7 a method for operating a television receiver.

8 Do you see that?

9 A I do.

10 Q Nothing requires that television receiver to
11 only receive a coaxial cable input; correct?

12 MR. HENDIFAR: Objection. Form. Scope.

13 THE WITNESS: I think the way I would put it
14 is absent any consideration of whatever else is in the
15 specification, the television receiver -- a typical
16 television receiver in the U.S. can be connected to
17 either an antenna or a coaxial cable.

18 BY MR. KRONENTHAL:

19 Q So you would agree that a television receiver
20 in the '275 patent could be connected to a radio
21 antenna; correct?

22 MR. HENDIFAR: Object to the form and scope.

23 THE WITNESS: I don't recall the moment where
24 it talks about being connected to an antenna. Oh,
25 wait. I'm sorry. It does say "Television channels in

1 a terrestrial television broadcasting system or the
2 cable TV channels in cable networks." I'm at the top
3 of Column 2, lines 2 through 5. The RF input signal
4 may include the VHF and UHF television channels in a
5 television, terrestrial television broadcasting system,
6 or the CATV channels in cable networks.

7 So, again, it expressly discloses a reference
8 that it may either be an antenna or a cable input,
9 which I colloquially refer to as a coaxial cable input.

10 BY MR. KRONENTHAL:

11 Q Okay. Thank you. And so we are on the same
12 page, you agree that the '275 patent covers television
13 receivers that receive RF channels; correct?

14 A Yes. Either over the air or through a cable
15 network; correct.

16 Q So a television receiver within the '275
17 patent for demodulating television channels would not
18 want to demodulate the RF channels in the aeronautical
19 radio navigation band; correct?

20 MR. HENDIFAR: Object to the form.

21 THE WITNESS: When connected to an antenna,
22 that is correct.

23 BY MR. KRONENTHAL:

24 Q Please turn to page 3 of that Exhibit 1086.

25 Page 3 shows another portion of the fourth row of the

1 spectrum from about 161.775 megahertz to 300 megahertz;
2 correct?

3 A Yes.

4 Q And it shows the frequencies between
5 174 megahertz and 216 megahertz are allocated for TV
6 Channels 7 through 13; correct?

7 A Yes. For terrestrial, over-the-air television
8 Channels 7 through 13, that is correct.

9 Q And please turn to page 4. Page 4 of
10 Exhibit 1086 shows a portion of the fifth row of the
11 spectrum from about 470 megahertz to 746 megahertz;
12 correct?

13 A Correct.

14 Q A portion on page 4 shows that the frequency
15 between 470 megahertz and 512 megahertz are in part
16 allocated for TV Channels 14 through 20; correct?

17 A Oh, yes, that is correct. For terrestrial,
18 over-the-air Channels 14 through 20, that is correct.

19 Q And it also shows that frequencies between
20 512 megahertz and 608 megahertz are allocated for TV
21 Channels 21 through 36; correct?

22 A Correct. Terrestrial, over-the-air Channels
23 21 through 36 are in that band.

24 Q A TV network operator would not have been
25 required to broadcast television channels on all of

1 Channels 2 through 36; correct?

2 MR. HENDIFAR: Objection to form and scope.

3 THE WITNESS: I guess I don't understand your
4 question. A TV network broadcaster would pick one
5 channel -- would receive a license to transmit on a
6 single channel if you are talking about terrestrial,
7 over the air.

8 BY MR. KRONENTHAL:

9 Q Yes. So let's take terrestrial, over the air,
10 for example. Time Warner, as a TV network operator,
11 would not have been required to broadcast television
12 channels on all Channels 2 through 36; correct?

13 A That's -- I don't understand your question.
14 Time Warner Cable does not broadcast over the air.

15 Q A TV network operator that broadcasts over the
16 air does not have to broadcast over each of the
17 television Channels 2 through 36; correct?

18 MR. HENDIFAR: Object to the form and scope.

19 THE WITNESS: As I said, a television operator
20 that does broadcast over the air receives a license to
21 transmit at a single frequency channel -- at a single
22 channel.

23 BY MR. KRONENTHAL:

24 Q And that television operator could choose to
25 license several different frequencies within the bands

1 available; correct?

2 A I don't think a television -- a local operator
3 can access -- can broadcast on multiple channels, no.

4 Q So, in your opinion, the same television
5 operator cannot take a license for multiple television
6 channels; is that correct?

7 A If you are talking about terrestrial,
8 over-the-air broadcasts, my understanding is that each
9 operator broadcasts on a single channel. I'm not aware
10 of a television, over-the-air broadcaster that licenses
11 multiple channels inside a single metropolitan area.

12 Q Okay. But you agree that Channels 2 through
13 36 are optional channels for television network
14 operators to use for broadcasting television; correct?

15 MR. HENDIFAR: Object to the form and scope.

16 THE WITNESS: A television network operator is
17 assigned one of those channels to broadcast in.

18 BY MR. KRONENTHAL:

19 Q Let's turn back to page 1 of Exhibit 1086.

20 Do you see the legend on the left-hand side?

21 A I do.

22 Q Do you see that the "ACTIVITY CODE" section of
23 the legend at the bottom?

24 A I do.

25 Q The "ACTIVITY CODE" section of the legend

1 shows three colored boxes to define government
2 exclusive activities, nongovernment exclusive
3 activities, and shared activities; correct?

4 A Correct.

5 Q And the "ACTIVITY" section of the legend
6 defines the green box as identifying nongovernment
7 exclusive uses; correct?

8 A Yes.

9 Q And it uses a red box as identifying the
10 government exclusive uses; correct?

11 A Correct.

12 Q If you'd turn to page 3 again, do you see the
13 green-shaded area below the frequencies for TV Channels
14 7 through 13?

15 A I see that.

16 Q That green-shaded area below the frequencies
17 for TV Channels 7 through 13 indicate that those
18 frequencies are for nongovernment uses; correct?

19 A Yes. When being transmitted over the air
20 terrestrially, that is correct.

21 Q Do you see the red-shaded area below the
22 frequencies from 235 megahertz through 300 megahertz?

23 A I do.

24 Q The channels in that frequency band between
25 235 megahertz and 300 megahertz might include military

1 uses; correct?

2 A I'm not, like, completely dialed into every
3 single frequency band, but it's certainly possible.
4 And, again, we are talking about terrestrial,
5 over-the-air transmissions. Yes.

6 Q The red-shaded area below the frequencies
7 between 230 megahertz and 300 megahertz are exclusively
8 for government use; correct?

9 A Yes. When transmitted over the air, that is
10 correct.

11 Q And those uses could include military uses;
12 correct?

13 A It's entirely possible, yes.

14 Q A television service provider would have
15 avoided broadcasting television channels in the
16 frequency bands exclusively allocated for government
17 use; correct?

18 A For an over-the-air television broadcaster,
19 that's correct. Over-the-air broadcasts are limited to
20 the channels, for example, as indicated in this chart.

21 Q A cable television provider would have also
22 avoided broadcasting television channels in the bands
23 that are exclusively allocated for government use as
24 well because, for example, there could be leakage out
25 of a cable network, though; correct?

1 A I don't know. I know that the cable plant is
2 isolated and has access to frequencies that
3 over-the-air broadcasters do not have access to.

4 Q So you don't know whether cable television
5 providers were concerned with the leakage out of a
6 cable network?

7 A I think that each television -- excuse me --
8 each cable operator made their own decisions about
9 which frequencies to use.

10 Q Do you believe a cable network operator chose
11 to use frequencies within the government, exclusive
12 frequencies in this chart?

13 MR. HENDIFAR: Objection. Foundation and
14 scope.

15 THE WITNESS: I mean, I know that it's at
16 least theoretically possible because coaxial cable is
17 isolated. I don't know what, again, each individual
18 cable operator decided to do.

19 BY MR. KRONENTHAL:

20 Q You would agree there could be leakage into
21 the cable network as well; correct?

22 MR. HENDIFAR: Object to the form.

23 THE WITNESS: It's possible. Leakage can go
24 both ways.

25 ///

1 BY MR. KRONENTHAL:

2 Q So, for over-the-air broadcasting, a POSITA
3 would not have built a TV receiver with circuitry
4 design to demultiplex channels exclusively allocated
5 for government use; correct?

6 A I think the way I would word it is the
7 designer of a television that is connected to an
8 antenna would have no need to access those frequencies.
9 I didn't word that right.

10 The designer would know that the television
11 would have no need to access those frequencies. That's
12 what I meant to say.

13 Q A POSITA would not have designed a television
14 receiver to output a channel that is exclusively for
15 government use; correct?

16 A There's a lot tacked into that question that I
17 don't understand, Counselor. I mean, the government
18 can take over stations using the emergency alert
19 system, for example. And there just wouldn't be a
20 television --

21 Between 235 and 300 megahertz, there would
22 just not be a television channel because, in
23 North America, there would not be a broadcast
24 over-the-air television channel in that frequency
25 range.

1 Q And so a television receiver would not be
2 designed to tune to, for example, every one of those
3 channels within that range; correct?

4 MR. HENDIFAR: Object to the form.

5 THE WITNESS: I'm sorry. I don't understand
6 what you mean by "channel."

7 BY MR. KRONENTHAL:

8 Q The RF channels within the range that are
9 exclusively for government uses.

10 MR. HENDIFAR: Object to the form.

11 THE WITNESS: I mean, all that's shown here is
12 that there's a chunk of bandwidth from 235 megahertz to
13 300 megahertz. I don't know how those are divided into
14 channels. Now, if by "channel" you mean the entire
15 65 megahertz chunk of bandwidth, there would be no need
16 to access that frequency band. Let me put it that way.

17 BY MR. KRONENTHAL:

18 Q So your television receiver wouldn't include a
19 tuner that's fixed to those frequencies; correct?

20 MR. HENDIFAR: Object to the form.

21 THE WITNESS: Again, if you are talking
22 about -- let's imagine a television that can only be
23 connected to a television antenna. That television
24 would not need to tune those frequencies.

25 ///

1 BY MR. KRONENTHAL:

2 Q Okay. Thank you. And a POSITA would have
3 found it unnecessary for a television receiver to have
4 separate circuitry for demultiplexing each of the
5 television Channels 2 through 36; correct?

6 MR. HENDIFAR: Object to the form.

7 THE WITNESS: Well, first off, it depends on
8 the tuner architecture, and then, secondly, again, this
9 would only be in the context of over-the-air broadcast
10 television, but it would depend on the tuner
11 architecture.

12 BY MR. KRONENTHAL:

13 Q Yes. And what I'm asking is that tuner
14 architecture wouldn't have a separate tuner for each of
15 TV Channels 2 through 36; correct?

16 A What do you mean by "tuner"?

17 Q The RF tuner that's tuning to the specific TV
18 Channel 2, for example.

19 A If you are talking about the type of tuner
20 that was in the set-top boxes that I designed, that is
21 correct.

22 Q It would have been unnecessarily costly for a
23 TV receiver to tune to each of television Channels 2
24 through 36; correct?

25 A If you are talking about the type of tuner

1 that I used inside my set-top boxes, that is correct.

2 Q So a POSITA would have designed a television
3 receiver to demultiplex only television channels among
4 all of the channels in the radio spectrum; correct?

5 MR. HENDIFAR: Object to the form.

6 THE WITNESS: I don't understand your
7 question.

8 BY MR. KRONENTHAL:

9 Q So a person of ordinary skill in the art
10 designing a TV receiver is going to design that
11 television receiver to demultiplex only television
12 channels within the spectrum; correct?

13 MR. HENDIFAR: Object to the form.

14 THE WITNESS: The way I would put it is this:
15 Someone designing a receiver system for a television is
16 going to design that receiver system to access the
17 frequencies where television channels may be found.

18 BY MR. KRONENTHAL:

19 Q Thank you. So --

20 A But where they are found is going to depend on
21 whether it's connected to an antenna or a coaxial
22 cable.

23 Q Yes. Thank you. And a person of ordinary
24 skill in the art would have designed a television
25 receiver to demultiplex only a subset of all of the

1 channels in the RF spectrum; correct?

2 MR. HENDIFAR: Object to the form.

3 THE WITNESS: It depends on the tuner
4 architecture.

5 BY MR. KRONENTHAL:

6 Q Yes. And with a tuner architecture again, the
7 tuner architecture being the number of tuners that are
8 going to be used for outputting the television
9 channels.

10 So a television receiver with a tuner
11 architecture for television channels is intentionally
12 designed to demultiplex only a subset of all channels;
13 correct?

14 MR. HENDIFAR: Object to the form.

15 THE WITNESS: If, by "tuner architecture," you
16 mean the type of tuner that was in the set-top boxes
17 that I designed, yes.

18 BY MR. KRONENTHAL:

19 Q So the type of tuner architecture in the type
20 of set-top boxes that you designed, demultiplex is only
21 a subset of the full spectrum of channels; correct?

22 A Inside the set-top boxes I design, each tuner
23 only accessed a single 6 megahertz bandwidth at a time.
24 Again, that's the tuner architecture of the set-top
25 boxes that I designed.

1 Q And you said it only accessed a single
2 megahertz bandwidth at a time?

3 A A single 6 megahertz bandwidth at a time.
4 That's the way that the tuners worked inside the
5 set-top boxes that I designed, yes.

6 Q But those set-top boxes would not access every
7 6 megahertz channel in the full spectrum; correct?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: The set-top boxes I design --
10 right -- would not at the same time. They were capable
11 of accessing the full spectrum, but they would only
12 access 6 megahertz at a time.

13 BY MR. KRONENTHAL:

14 Q So it's your opinion that the set-top boxes
15 you design would access channels that were not used for
16 television?

17 MR. HENDIFAR: Object to the form.

18 THE WITNESS: I don't understand what you mean
19 by "channels that were not used for television." Every
20 channel on a cable plan is used for television. Every
21 6 megahertz -- well, I'm sorry. Let me take back what
22 I just said. I don't understand your question.

23 BY MR. KRONENTHAL:

24 Q You'd agree that the channels in a cable
25 network are not contiguous; correct?

1 MR. HENDIFAR: Object to the form.

2 THE WITNESS: Well, like I said, first off,
3 if, by "channel," you mean the 6 megahertz RF channels,
4 there are definitely bands where they are contiguous.
5 There are huge swaths of bandwidths where they are
6 contiguous. Everything above -- every UHF and higher,
7 for example, I know for a fact is contiguous.

8 BY MR. KRONENTHAL:

9 Q There are other bands that are not contiguous
10 with the UHF band; correct?

11 A In the set-top boxes that I design, there are
12 three bands -- three noncontiguous bands.

13 Q So there were gaps in those three
14 noncontiguous bands; correct?

15 A Yes. Now, inside one band, the television
16 channels are contiguous, but the bands themselves are
17 not.

18 Q You didn't use a different tuner for the
19 different bands; correct?

20 A The way that the tuners were designed, that's
21 correct. So the access -- yes.

22 Q Okay. You used one tuner to access the three
23 different bands; correct?

24 A That's correct. And the television channels
25 inside each band were contiguous.

1 Q But you did not use that one tuner to access
2 the portions of the spectrum between those
3 noncontiguous bands; correct?

4 A Let me stop for a second and really think
5 about -- think about my answer here because I may have
6 to walk back through something I just said.

7 The North American television channels are --
8 over the air are allocated in roughly three
9 noncontiguous bands. I don't remember how many
10 noncontiguous bands are in a cable tuner.

11 Now, again, inside each band, the television
12 channels are contiguous.

13 Q Yes. And we agree that, for example, the
14 Explorer 4200 you worked on had one radio tuner;
15 correct?

16 A That is correct.

17 Q And that Explorer 4200 single-video tuner
18 could tune to each of the RF channels in those three
19 noncontiguous bands; correct?

20 A Again, I don't recall how many noncontiguous
21 bands there were; but they could access channels in
22 each of those noncontiguous bands, yes, 6 megahertz at
23 a time.

24 Q But you did not design the Explorer 4200 so
25 that its single-video tuner would attempt to access the

1 channels and the frequencies between the noncontiguous
2 bands; correct?

3 A I believe that's correct.

4 Q So, then, you would agree that the set-top
5 boxes, for example, the Explorer 4200, were designed to
6 use a single video tuner that only accessed a subset of
7 all of the channels that were available to it; correct?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: It accessed all of the channels
10 that were available to it. Not all RF spectrum is
11 available, but all of the channels that are available
12 to it, it could access.

13 BY MR. KRONENTHAL:

14 Q Okay. So you agree that the Explorer 4200 had
15 a single video tuner that accessed a subset of all of
16 the RF spectrum that was available to it; correct?

17 A I admit I don't remember exactly how the tuner
18 was designed, but the tuner would be able to access all
19 of the -- all of the channels allocated on a cable
20 network, all of the 6 megahertz channels that were
21 allocated on the cable network. So my answer is it
22 depends on the cable network.

23 Q Is it your opinion that the cable network was
24 transmitting -- strike that.

25 You agree that the cable network was

1 transmitting cable television channels in three
2 separate, noncontiguous bands; correct?

3 MR. HENDIFAR: Object to the form.

4 THE WITNESS: As I sit here at the moment, I
5 don't recall how many noncontiguous bands were in use.
6 I know that they were in the range that -- frequencies
7 in the range 54 to 860 megahertz were in use. I don't
8 know for specific networks how many noncontiguous bands
9 there were.

10 BY MR. KRONENTHAL:

11 Q Okay. But you agree that there were at least
12 two noncontiguous bands within that 54 to 860
13 megahertz; correct?

14 MR. HENDIFAR: Object to the form.

15 THE WITNESS: The way I would put it is it's
16 possible that an individual operator -- cable operator
17 might use noncontiguous bands; but it depends again on
18 the table, how the local operator allocated frequencies
19 on their cable band.

20 BY MR. KRONENTHAL:

21 Q Okay. So let's take the situation where the
22 cable operator uses two noncontiguous bands within that
23 54 to 860 megahertz. Are you with me?

24 A Okay. So we are in a hypothetical where there
25 are two noncontiguous bands.

1 Q Correct.

2 A Okay.

3 Q Within the full 54 to 860 megahertz.

4 A Okay.

5 Q A set-top box would not have been designed to
6 demultiplex the channels between those noncontiguous
7 bands; correct?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: Well, I guess I don't understand
10 your question. The tuner -- the type of tuners that I
11 was familiar with back when I was designing cable
12 set-top boxes is only going to pull out one 6 megahertz
13 chunk of bandwidth at a time. So it's only going to, I
14 guess, use -- assuming that's what you mean by
15 "demultiplex," it's only going to demultiplex a single
16 6 megahertz channel at a time.

17 BY MR. KRONENTHAL:

18 Q Correct. And it's not going to demultiplex
19 every 6 megahertz piece of that full spectrum because
20 some parts of that full spectrum are not for
21 television; correct?

22 A Correct. It's not going to attempt to tune to
23 a 6 megahertz bandwidth that is not carrying a
24 television channel.

25 Q Thank you. So --

1 A Again, it's 6 megahertz at a time. So that's
2 a 6-megahertz window. Unless there's a bug or mistake
3 somewhere, it's only going to be aimed at a channel
4 that the cable operator is carrying.

5 So, again, under normal circumstances, you
6 know, barring some equipment failure or something, it's
7 going to be aimed at a channel where there is -- where
8 there is a television channel.

9 Q So we are in agreement that the cable set-top
10 box would only demultiplex a subset of the full band --

11 MR. HENDIFAR: Object to the form.

12 BY MR. KRONENTHAL:

13 Q -- in the cable network?

14 MR. HENDIFAR: Object to the form.

15 THE WITNESS: The boxes that I designed would
16 demultiplex a single channel at a time, and that
17 channel would be somewhere -- would be a channel that
18 was allocated by the cable operator. And I'm sorry.
19 To be clear, each tuner is going to demultiplex a
20 single channel at a time.

21 BY MR. KRONENTHAL:

22 Q Yes. But each tuner is not going to
23 demultiplex every 6 megahertz channel within the full
24 spectrum of the cable network; correct?

25 MR. HENDIFAR: Object to the form.

1 THE WITNESS: As I said, the tuner, as a
2 practical matter, would only be tuned to a location
3 where a cable operator had a channel.

4 BY MR. KRONENTHAL:

5 Q And the cable operator would not have a
6 channel at every frequency within that 54 to
7 860 megahertz?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: That would be up to the cable
10 operator.

11 BY MR. KRONENTHAL:

12 Q But you agree that cable operators were using
13 noncontiguous bands within those 54 to 860 megahertz
14 spectrum; correct?

15 MR. HENDIFAR: Object to the form.

16 THE WITNESS: It's up to each individual cable
17 operator, but it was possible.

18 MR. KRONENTHAL: Maybe now would be a good
19 time for a break.

20 MR. HENDIFAR: Sure.

21 MR. KRONENTHAL: Can we go off the record?

22 (Off the record.)

23 MR. KRONENTHAL: Back on the record.

24 BY MR. KRONENTHAL:

25 Q So, Dr. Russ, I think you have the '275 patent

1 in your stack of papers; correct?

2 A I do.

3 Q Okay. So, if you could, turn to Figure 2 of
4 the '275 patent.

5 A Okay.

6 Q Figure 2 shows a digital front end DFE 230
7 including a capital N mixers; correct?

8 A Yes.

9 Q The capital N there is a variable; correct?

10 A Yes.

11 Q A POSITA would have understood that the
12 capital N would have been an integer equal to one or
13 more; correct?

14 A Correct.

15 Q The digital front end DFE 230 includes a bank
16 of N complex mixers and N filters, one filter for each
17 mixer; right?

18 A Correct.

19 Q So there are N paths for the DFE in Figure 2;
20 correct?

21 A Correct.

22 Q If we turn to Figure 3, Figure 3 of the '275
23 patent shows one of those paths; correct?

24 A Yes, I believe that's correct.

25 Q The path shown in Figure 3 of the '275 patent

1 selects one desired channel; correct?

2 A "Desired" is a claim term. So I'm going to
3 have to look at the patent in more detail. I think
4 that's generally true, yes.

5 Q And another path from the N paths in Figure 2
6 would select another desired channel; correct?

7 A Again, with reference to the claim language,
8 to the extent that Figure 2 maps with the claim
9 language, that's correct.

10 Q Do you believe that Figure 2 of the patent
11 does not map to the claim language?

12 A I'm sorry. What I mean is the Figure 2 --
13 let's see. The outputs are to demodulators. So, yes,
14 each of the N signal paths is a desired channel.
15 That's right.

16 Q For clarity, each of the N paths in Figure 2
17 selects a separate desired channel; correct?

18 A Yes, I think that's correct.

19 Q So if there are two paths for the DFE in
20 Figure 2, those two paths would select two desired
21 channels; correct?

22 A Yes, I think that's correct.

23 Q Let's look at the background of the '275
24 patent starting in Column 1.

25 A Okay.

1 Q The first sentence says: "This invention
2 relates to wideband receiver systems and methods having
3 a wideband receiver that is capable of receiving
4 multiple radio frequency channels located in a broad
5 radio frequency spectrum."

6 Do you see that?

7 A I do.

8 Q A POSITA would have understood that the '275
9 patent relates to a receiver that relates to a wide
10 range of frequencies; correct?

11 A Right. Or that had a high bandwidth;
12 correct -- high-input bandwidth; correct.

13 Q And the next sentence says: "In particular,
14 the invention relates to wideband receiver systems that
15 are capable of receiving multiple desired television
16 channels that extend over multiple non-contiguous
17 portions of the broad frequency spectrum and grouping
18 them into a contiguous, or substantially-contiguous,
19 frequency spectrum."

20 Do you see that?

21 A I do.

22 Q A POSITA would have understood that the '275
23 patent is directed to the grouping of the noncontiguous
24 portion into a contiguous portion and doesn't allege to
25 have invented the concept of television channels being

1 in noncontiguous portions; correct?

2 A Well, first off, I think contiguous is --
3 noncontiguous is illustrated there in Figure 1, which
4 shows a swath of channels 110, occupies a bandwidth B1,
5 and it shows that there are four channels that are
6 highlighted there, and those are noncontiguous
7 channels. So that's what the -- so the noncontiguous
8 there can refer to, for example, where there's a one
9 swath of bandwidth that are contiguous, but the
10 individual channels that are desired are not
11 contiguous.

12 Q And Figure 1 there that you refer to is
13 labeled as "Prior Art"; correct?

14 A Yes.

15 Q So the patent, the '275 patent, doesn't allege
16 to have invented the concept of transmitting channels
17 in noncontiguous frequencies; correct?

18 A Correct. And the prior art, desired channels
19 may be at noncontiguous frequencies. There may be
20 channels in between, for example.

21 Q And the channels in between would be undesired
22 channels; correct?

23 A Yes.

24 Q Could we go to Column 1, lines 52 to 55.

25 A Certainly.

1 Q So that's Column 1, lines 52 to 55. This
2 portion admits that it was non- -- for television
3 channels to be noncontiguous; correct?

4 A Right. "The channel frequencies may not be
5 adjacent to each other." Continuing the quote, "In
6 certain applications such as DVR and
7 picture-in-picture, the receiver system may have to
8 concurrently receive several desired channels that may
9 or may not be contiguous." Yes.

10 Q All right. Let's look at Column 1, line 67,
11 to Column 2, line 2.

12 A Okay.

13 Q It says: "The RF signal may include one or
14 more television channels receiving from a cable network
15 via an RF connector or wirelessly via an antenna";
16 correct?

17 A Correct.

18 Q This explains that the RF input signal 102
19 from Figure 1 includes very high frequency channels and
20 ultra-high frequency channels; correct?

21 MR. HENDIFAR: Object to the form.

22 THE WITNESS: The next sentence further
23 explains: "The RF input signal may include the VHF and
24 UHF television channels in a terrestrial television
25 broadcasting system." So, yes, in the special case of

1 receiving channels via an antenna, that is correct.

2 BY MR. KRONENTHAL:

3 Q Okay. Let's look at Column 2, lines 16 to 18.

4 A Okay.

5 Q In Column 2, lines 16 to 18, the '275 patent
6 explains that the RF input signal would have desired
7 channels at noncontiguous portions of the RF spectrum;
8 correct?

9 A Correct. And this is illustrated in Figure 1.
10 Correct.

11 Q And this reflects the knowledge of a POSITA
12 who would have known that desired channels are at
13 noncontiguous portions of the RF spectrum; correct?

14 A That desired channels may be in noncontiguous
15 locations; correct.

16 Q And Figure 1 shows a single tuner 100;
17 correct?

18 A Correct.

19 Q Figure 1 shows the RF signal having a
20 bandwidth of 60 to 80 megahertz covering a swath of
21 10 channels; correct?

22 A Correct.

23 Q And using synthesizer S1, the tuner 100 is
24 able to tune to the center of the swath of frequencies;
25 correct?

1 A Correct.

2 Q The Figure 1 example shows that a single tuner
3 can be adjusted to capture a specific swath of
4 frequencies; correct?

5 A Correct.

6 Q Based on Figure 1, a POSITA would have
7 understood that it was known multiple tuners were not
8 needed for multiple desired channels; correct?

9 MR. HENDIFAR: Object to the form.

10 THE WITNESS: Well, in this architecture, I
11 mean, for example, all of the tuners I was talking
12 about in the set-top boxes I designed work differently;
13 but here in Figure 1, this tuner is tuning a swath of
14 ten channels at a time. And as long as all of the
15 desired channels are located in that swath of ten
16 channels, then that one tuner would not need to change
17 to a different frequency.

18 BY MR. KRONENTHAL:

19 Q So instead of using a separate tuner for each
20 desired channel in Figure 1, it was known that the same
21 tuner could be used and set to tune to a desired
22 channel; correct?

23 MR. HENDIFAR: Object to the form.

24 THE WITNESS: Well, in the example in
25 Figure 1, the tuner can bring in ten channels at the

1 same time spanning a bandwidth of 60 to 80 megahertz;
2 and in this example, that 60 to 80 megahertz swath
3 contains four desired channels. So, in this specific
4 instance -- right -- those four channels are inside the
5 output of the tuner.

6 BY MR. KRONENTHAL:

7 Q Let's look at Column 2, lines 33 to 39.

8 A Okay.

9 Q So in Column 2, lines 33 to 39, the '275
10 patent states [as read]: "It is noted that in other
11 applications where the desired RF channels are located
12 in the low band such as channels numbers 2 to 6," and
13 in parens, "(very high frequency in the terrestrial TV
14 broadcast or CATV), and in the high band such as
15 channels numbers 14 to 83 of the UHF TV broadcast or
16 channel numbers 63-158 of the CATV's ultra band, the
17 bandwidth BW1 can be 800 megahertz or higher"; correct?

18 A That is what the patent says in that column.
19 Yes, that is correct.

20 Q So the '275 patent also admits that it was
21 known for an RF's input signal to have a bandwidth of
22 800 megahertz or higher; correct?

23 A That is possible for desired channels to be
24 contained in a range as high as 800 megahertz. Yes.

25 Q And the desired channels could be

1 noncontiguous channels within that 800 megahertz range;
2 correct?

3 A Correct.

4 Q A POSITA would have understood that a receiver
5 would not include a tuner for each of the desired
6 channels in an RF signal with a bandwidth of 800
7 megahertz; correct?

8 A If, by "tuner," you mean the type of tuners
9 that were in the set-top boxes that I designed, that is
10 correct.

11 Q The '275 patent uses the term "desired
12 channels" in multiple places; correct?

13 A Yes.

14 Q The '275 patent does not define the term
15 "desired channels"; correct?

16 MR. HENDIFAR: Object to the form.

17 THE WITNESS: I think it's pretty clear. I
18 mean, first in Column 1, 52 through roughly 58, it
19 talks about how -- it says: "In certain applications
20 such as DVR and picture-in-picture, the receiver system
21 may have to concurrently receive several desired
22 channels that may or may not be contiguous."

23 And so a POSITA would understand that if you
24 are recording a channel or if you are viewing a channel
25 or if you are viewing a channel inside another, which

1 is what picture-in-picture is, every one of those
2 channels is being processed by the set-top box, and the
3 processing step necessarily includes demodulation.

4 So I think, for ease of understanding, that's
5 why I say that the desired channel is one that's being
6 demodulated. It's being passed through the
7 demodulator. So a POSITA would certainly understand
8 from that passage that that's what it means by "desired
9 channel," a channel that's being processed such as by
10 being demodulated.

11 Three, let's see. Yes, so that's an example
12 of a place where "desired channel" is defined.

13 BY MR. KRONENTHAL:

14 Q Okay.

15 A Where -- it is a place where -- excuse me --
16 the concept of a desired channel is clearly explained
17 to a person of ordinary skill.

18 Q Okay. So yes. So it describes the desired
19 channel there that a person of ordinary skill in the
20 art would understand is what you are saying?

21 A Yeah. A person of ordinary skill would
22 understand, and the desired channel is one that's being
23 processed as one that is being demodulated.

24 Q So a person skilled in the art would
25 understand that the ordinary meaning of a "desired

1 channel" would include a channel with content that a
2 user or subscriber wants to watch; correct?

3 A In the context of this patent specification,
4 the desired channel is one that is actually being put
5 to use such as that means demodulated.

6 Q And a POSITA would have understood that what
7 it means by a desired channel is an approved channel
8 that the subscriber selects; correct?

9 A Well, it would -- it would be a channel that
10 the set-top box would select for subsequent
11 demodulation.

12 Q And the set-top box selects that channel based
13 on a subscriber selection; correct?

14 A Well, there's a lot of reasons why it might be
15 doing it. One reason would be a subscriber.

16 Q Yes. So a POSITA would have understood that
17 the ordinary meaning of a desired channel to include a
18 channel that a subscriber selects; correct?

19 A If, by selecting a channel, you mean a
20 subscriber, like, for example, wishes to view a
21 channel, so that channel would have to be passed to a
22 demodulator, then, yes, that would be an example of a
23 desired channel.

24 Q A POSITA would have also understood that the
25 ordinary meaning of a "desired channel" includes a

1 channel that a subscriber accesses; correct?

2 MR. HENDIFAR: Object to the form.

3 THE WITNESS: In the context of the '275
4 patent specification, if by "desired" -- excuse me --
5 by "access," do you mean one that is processed such as
6 by demodulation? Then yes.

7 BY MR. KRONENTHAL:

8 Q And a POSITA would have understood that the
9 ordinary meaning of "desired channel" could also
10 include any channel that a subscriber subscribes to;
11 correct?

12 MR. HENDIFAR: Object to the form.

13 THE WITNESS: Well, I think that's unfairly
14 broadening the definition. I mean, the -- again, any
15 channel that's being processed such as by demodulation
16 is a desired channel. That's what the passage in
17 Column 1, starting at line 55, I think, pretty clearly
18 explains, I think pretty clearly explains to a POSITA.

19 BY MR. KRONENTHAL:

20 Q Okay. The '275 patent also uses the term
21 "undesired channel" several times; correct?

22 A Correct.

23 Q It doesn't define the undesired channels;
24 correct?

25 A Well, I don't think it needs to. If a desired

1 channel is one that's being processed such as by
2 demodulation, an undesired channel is not being
3 demodulated, for example.

4 Q So you would agree that a person of ordinary
5 skill in the art would have understood the ordinary
6 meaning of an undesired channel to include any channel
7 that is not a desired channel; correct?

8 A You know, I don't think I expressed that
9 opinion in my report. So I think I expressed opinions
10 about what a desired channel is. I'm going to stop
11 there.

12 Q So you have no opinion about what an undesired
13 channel is?

14 A Well, let me stop a second and ask. This is
15 why I don't understand your question. Is "undesired
16 channel" a claim term?

17 Q It is. If we look at Claim 1 of the '275
18 patent --

19 A Oh.

20 Q -- and receiving step.

21 A Yes. Thank you for refreshing my
22 recollection. So an undesired channel would be a
23 channel that is not a desired channel.

24 Q And your declaration did not aim to provide a
25 definition for "desired channel" or "undesired

1 channel"; correct?

2 A I don't know -- I don't recall at the moment
3 where there's an express definition; but I think the
4 opinions I express are consistent with what I just
5 said. Let me put it this way: If it's not in my
6 declaration, I believe my declaration to be consistent
7 with what I just said. I think what I said is the fair
8 distillation of the opinions I express in my
9 declaration.

10 Q The ordinary meaning of an "undesired channel"
11 would also include the channels in the parts of the
12 frequency spectrum that do not include the desired
13 channels; correct?

14 MR. HENDIFAR: Objection to form and scope.

15 THE WITNESS: I guess I don't understand your
16 question. I mean, there are -- a cable operator has
17 put certain channels on the plant. If they are being
18 demodulated, they are desired, and the remaining
19 channels on the plant at that moment in time are
20 undesired channels.

21 BY MR. KRONENTHAL:

22 Q And the channels and the frequencies between
23 the noncontiguous desired channels, those would be
24 undesired channels; correct?

25 MR. HENDIFAR: Object to the form and scope.

1 THE WITNESS: I don't understand by what you
2 mean channels in the noncontiguous portion. If they
3 don't contain -- I don't understand your question.

4 BY MR. KRONENTHAL:

5 Q Okay. Let's turn to Figure 2 of the '275
6 patent.

7 A Okay.

8 Q The RF input 102 to Figure 2 is the same
9 RF 102 from the prior art; correct?

10 A Correct. It is an 80-megahertz chunk of
11 bandwidth containing ten RF channels.

12 Q Each of the ten channels, is that a bandwidth
13 of 8 megahertz? Correct?

14 A In this example, yes, which would be, like, a
15 European channel.

16 Q In the U.S., that would be 6 megahertz;
17 correct?

18 A Correct.

19 Q Of the ten channels, the four shaded channels
20 are identified as being eight desired channels;
21 correct?

22 A I think that's correct, yes.

23 Q And the other six channels would be undesired
24 channels; correct?

25 A In this example, that's correct.

1 Q And those other six channels are in the
2 portions between the noncontiguous, desired channels;
3 correct?

4 A Correct.

5 Q The RF input is provided to the radio front
6 end 210; correct?

7 A Correct.

8 Q The radio front end separates the RF input
9 into I and Q components; correct?

10 A Correct.

11 Q Then the I and Q components are converted into
12 digital signals by the two ADCs; correct?

13 A Correct.

14 Q The digitized signals output from the ADCs go
15 to complex mixers 250; correct?

16 A Correct. Yes.

17 Q And each complex mixer 250 shifts the digital
18 signals down to a baseband by multiplying the digital
19 signals by a target frequency; correct?

20 A They -- each signal path has a mixer, and the
21 mixer is programmed to pluck out the desired channel.
22 And so, then, the subsequent processing steps along
23 that signal path, then, are operating on that single
24 channel that was -- that the -- that that signal path
25 has been programmed to process.

1 Q And then the shifted signals are then filtered
2 by the low-pass filters; correct?

3 A Correct. Each shifted signal by its own
4 low-pass filter; correct.

5 Q Can we agree to refer to the combination of
6 one complex mixer 250 and one corresponding low-pass
7 filter as a "mixer-filter chain"?

8 A If you want to call it that, that's fine.

9 Q So each mixer-filter chain extracts a
10 particular channel from the digital signal; correct?

11 A It again isolates a specific channel from the
12 input. Yes.

13 Q And by isolating that specific channel, it is
14 extracting that specific channel; correct?

15 A I'm not sure why you insist on using the word
16 "extract," but it is -- the result of this step is a
17 single channel coming out of the low-pass filter.

18 Q So I used the term "extract" in my question,
19 and you switched the term to "isolate" in your answer.
20 So are you using "isolate" to be different than
21 "extracting"?

22 A I'm explaining how it works. I just
23 testified -- I just noted that you somehow -- I'm just
24 explaining how it works.

25 Q Well, do you think it's a fair

1 characterization to say that the mixer-filter chain
2 extracts a channel from the digital signal?

3 A I'm sorry. Is "extract" a claim term or found
4 in the specification? I'm not sure why you are focused
5 on that one word.

6 Q Let's go to Claim 1.

7 A Okay.

8 Q I'm looking towards the bottom. Claim 1 has a
9 selecting limitation; correct?

10 A Correct.

11 Q Claim 1 recites: "Selecting by a digital
12 front end DFE coupled to the ADC the plurality of the
13 desired channels from the digitized signal"; correct?

14 A Correct.

15 Q That claim-selecting step would include the
16 extracting or isolating a form by the mixer-filter
17 chains; correct?

18 A I mean, if you are -- the mixer-filter chain
19 in Figure 2 is an example of something that could carry
20 out the selecting step of the claim. Yes.

21 Q Okay. So a person of ordinary skill in the
22 art would understand that extracting or isolating is a
23 type of selecting within the scope of Claim 1; correct?

24 A I'm not sure why you are using the words
25 "isolating" or "extracting." Let me be clear. I

1 understand that I said "isolating," but all the claim
2 says is "selecting." So that's -- that's what I'm
3 going to go with, that that filter -- excuse me --
4 mixer-filter chain is an example of a circuit that
5 performs the selecting step in the claim.

6 Q Okay. And you agree that the mixing-filter
7 circuit performs isolated, to use your term; correct?

8 A In the sense that the output is a single
9 channel, yes.

10 Q It picks out a single channel; correct?

11 A The output is a single channel, and the
12 circuit as a whole is an example of a circuit that
13 performs the claim-selecting step. And, again, in the
14 context of the '275, that's because that is a desired
15 channel that's been passed through the modulator, which
16 is another -- sorry -- claim limitation coming up.

17 Q Okay. I want to -- you said, "The circuit as
18 a whole is an example of what performs the
19 claims-selecting step."

20 Did you mean the entire system from Figure 2,
21 or you would agree that it's not the entire system from
22 Figure 2 that performs the selecting step, it's the
23 multiplier-filter chain? Correct?

24 A The multiplier-filter chain and possibly the
25 optional decimator 270, yes.

1 Q Okay. For clarity, the multiplier-filter
2 chain and possibly the optional decimator is what
3 performs the claim-selecting step in Claim 1; correct?

4 A Well, the step requires selecting plurality of
5 desired channels. So it's the collection of those
6 circuits together that perform the claim step. An
7 example of a circuit that performs a single selecting
8 step is the mixer-filter chain and optional decimator.

9 Q Okay. Thank you.

10 A And, again, it's because it's performing the
11 selecting steps so it can output to a demodulator.

12 Q Okay. Let's look back at Figure 2.

13 A Okay.

14 Q We agree there's four channels that are
15 desired in Figure 2; correct?

16 A I'm sorry. Where does the number 4 come from?
17 if you don't mind refreshing my recollection.

18 Q The 4 -- Figure 2 of the '275 patent on the
19 bottom.

20 A Oh, yes. Thank you for refreshing my
21 recollection. In this example, in the lower left-hand
22 corner of the diagram, it shows that there are four
23 desired channels. Yes, that is correct.

24 Q It's the four shaded channels; correct?

25 A That's correct. Yes.

1 Q So there would be four mixer-filter chains for
2 demultiplexing these four desired channels; correct?

3 A If those four channels were desired at the
4 same time, the way I would put it is it would have to
5 be at least four filter-mixer chains -- excuse me --
6 mixer-filter chains. Yes.

7 Q Each one of the mixer-filter chains would have
8 an NCO that is programmed to extract one of the four
9 desired channels; correct?

10 A Well, it would have some circuit structure
11 that would drive the mixer, yes, an example of which
12 would be an NCO.

13 Q So if there are four desired channels, then
14 there are four mixer-filter chains in the DFE according
15 to the '275 patent; is that right?

16 A Yeah. The way I would put it, if at one
17 moment in time there were four channels that were
18 desired, there would need to be at least four
19 mixer-filter chains to output those four at the same
20 time. Yes.

21 Q So, in your opinion, the number of
22 mixer-filter chains in the DFE is the same as the
23 number of desired channels; is that right?

24 A It's the same as the number -- yes. It's the
25 same as the number of desired channels subject to the

1 constraint that a person of ordinary skill would be
2 designing this for some -- some -- some requirement for
3 the maximum number of desired channels. Yes.

4 Q In your opinion, the number of mixer-filter
5 chains in the '275 patent depends on the number of RF
6 channels to be demultiplexed; is that right?

7 A I'm sorry. Can you please repeat the
8 question.

9 Q It's your opinion that the number of
10 mixer-filter chains in the '275 patent depends on the
11 number of RF channels to be demultiplexed; is that
12 right?

13 A I would say it's dependent on the number of
14 channels that are desired at the same time.

15 Q And the number of channels that are desired
16 are the number of channels that are going to be
17 demultiplexed; correct?

18 A I guess as a practical matter. The point is
19 that there's as many signal chains as there are desired
20 channels.

21 Q Yes. So the number of mixer-filter chains in
22 the '275 patent depends on the number of desired
23 channels to be demultiplexed; correct?

24 A It's based on the number of desired channels.

25 Q So, in contrast, the number of mixer-filter

1 chains in the '275 patent does not depend on the total
2 number of RF channels within the input signal; is that
3 correct?

4 A I think that's correct. The number of
5 mixer-filter chains is driven by the number of desired
6 channels.

7 Q It is driven by the number of desired channels
8 that are to be demultiplexed for output; correct?

9 A It's driven by the number of desired channels.

10 Q The DFE in the '275 patent that is built with
11 four desired channels would still be able to handle an
12 input signal with only three desired channels; right?

13 THE REPORTER: I'm sorry. Can you repeat
14 that.

15 MR. KRONENTHAL: Sure.

16 BY MR. KRONENTHAL:

17 Q A DFE in the '275 patent that is built for
18 four desired channels would still be able to handle an
19 input signal with only three desired channels; right?

20 A I don't understand your question.

21 Q In the Figure 2 example of the '275 patent,
22 that system would be able to demultiplex only three
23 desired channels; right?

24 A I guess the way I would put it is if there are
25 four mixer-filter chains in the digital front end, it's

1 possible that only three of them are outputting a
2 desired channel at one moment. It's possible there may
3 be a situation where there's only three channels that
4 are desired at that moment.

5 Q Is it your opinion that the receiver system in
6 Figure 2 is built with a fixed number of
7 multiplier-filter chains based upon the number of
8 desired channels expected?

9 A Let's see. Let's see what the patent says.
10 Let's see. In Column 5, line 58, it says that, in this
11 example, "N is an integer value corresponding to the
12 number of desired RF channels located in the
13 non-contiguous portions of the frequency spectrum BW1."
14 That's, in this embodiment, how the capital N integer
15 is defined in this embodiment. Let's see.

16 [As read] "In the exemplary embodiment shown
17 in Figure 2" -- I'm now at the top of Column 6 -- "the
18 number of desired channels is 4. That is, each of the
19 4 complex mixers" carries out steps.

20 So, in this example, the system has been
21 designed for four desired channels, and therefore,
22 there are four signal chains in this example.

23 Q So, in this Figure 2 example, there would be
24 four multiplier-filter chains?

25 A Yes, because the number of desired chains is

1 four.

2 Q Would that same example work if the input had
3 only three desired channels?

4 MR. HENDIFAR: Objection. Form and scope.

5 THE WITNESS: I haven't considered what would
6 happen if there's three desired channels.

7 BY MR. KRONENTHAL:

8 Q You don't know what would happen if there were
9 only three desired channels?

10 A That's not what I said.

11 Q Well, you are an expert, and you are sitting
12 here today. Can you consider whether it would work for
13 three desired channels?

14 A I have not expressed an opinion on that. It
15 would take time and study for me to have an opinion.
16 So I don't -- I have not expressed an opinion on that,
17 nor am I willing to express one here.

18 Q Earlier, I believe you said that one of the
19 four multiplier chains would just not be used if there
20 were only three desired channels; is that correct?

21 A I do believe that I said that; but upon
22 further reflection, again, that is not an opinion I've
23 expressed in this report. So I have not -- I think I
24 would -- I think a more complete answer to the question
25 I answered earlier is -- a better answer is I have not

1 expressed an opinion on that in my report.

2 Q So are you backtracking on what you previously
3 said about not using the fourth multiplier-filter
4 chain?

5 A Yes.

6 Q So, sitting here today, you are not able to
7 tell me how a person of ordinary skill in the art would
8 understand a DFE to work if it had four
9 multiplier-filter chains, but only three desired
10 channels were to be output; is that correct?

11 MR. HENDIFAR: Object to the form. Beyond the
12 scope.

13 THE WITNESS: The way I would put it is I'm
14 not able at this moment to express an opinion on that.
15 It's not an issue that I've studied, and it's not an
16 issue that arises in the patent specification.

17 BY MR. KRONENTHAL:

18 Q A person of ordinary skill in the art would
19 understand that the benefit of using an NCO is that the
20 system has flexibility to choose from various desired
21 channels that may change over time; correct?

22 A Can you refresh my recollection where the '275
23 discusses NCO. Oh, I see. The bottom of Column 6, "In
24 an embodiment, a numerically --

25 THE REPORTER: I'm sorry. Can you read a

1 little slower.

2 THE WITNESS: Column 6, "In an embodiment, a
3 numerically controlled oscillator with quadrature
4 output generates the cosine and sine signals.
5 Numerically controlled oscillators (NCO) can be
6 implemented using a phase accumulator and a look-up
7 table. NCOs are known to those of skill in the art and
8 will not be described herein."

9 So the '275 expressly discloses the use of an
10 NCO, and it's clear that each chain is used for a
11 desired channel, and that desired channel may change
12 over time. So it makes sense that something like an
13 NCO would be used to give that chain the ability to
14 change which channel it is selecting.

15 BY MR. KRONENTHAL:

16 Q Thank you. So a person of ordinary skill in
17 the art would understand that the benefit of using an
18 NCO is that the system has flexibility to choose from
19 various desired channels that may change over time;
20 correct?

21 A In this specific case of the '275 patent,
22 that's correct where the NCO is going to change every
23 time the desired channel is changing. That is correct.
24 In an architecture where every chain is always tied to
25 a single channel, we would not necessarily need that

1 flexibility.

2 Q Are you aware of an architecture where there
3 is -- strike that.

4 A POSITA would understand that the DFE in the
5 '275 patent uses an NCO so that it has the flexibility
6 to use the same multiplier-filter chain to get
7 different channels from different input signals; right?

8 A Yes. For example, the first signal chain
9 could be tuned to one channel because it's a desired
10 channel. And if the circumstances change and a
11 different desired channel is selected, then that
12 signal-processing chain would change to the new desired
13 channel, yes, in the '275 patent.

14 Q Yeah. And you talked about circumstances
15 changing in your answer. So an example of a
16 circumstance changing would be a different input signal
17 from -- on the RF input; is that correct?

18 A No. What I was talking about is that, for
19 example, if the -- I mean, remember, the '275 patent
20 defines a desired channel over there in Column 1. And
21 so, for example, you know, if someone is watching
22 something picture-in-picture and they change the
23 channel, it means that there's a different desired
24 channel, and so the signal-processing chain, the
25 mixer-filter chain, would be switched to reflect the

1 fact that a different channel is now desired. So it's
2 not about a change --

3 Well, in this example it's not about a chain
4 in the RF input. It's a chain in what is desired.

5 Q You would agree that the Figure 2 embodiment
6 could work for different input signals; correct?

7 MR. HENDIFAR: Object to the form.

8 THE WITNESS: Well, I mean, the Figure 2
9 example is tied to a specific example of an RF input.
10 I mean, I guess I don't know what you mean by
11 "different RF input signals."

12 BY MR. KRONENTHAL:

13 Q So the Figure 2 example shows the bandwidth 1
14 equal to 80 megahertz; correct?

15 A Correct.

16 Q You would agree that the Figure 2 example
17 would work for a different RF signal with a greater
18 bandwidth; correct?

19 A I mean, I haven't considered the range of
20 what's possible. I'm just noting in this example it's
21 an 80-megahertz bandwidth.

22 Q So you don't know whether the Figure 2 system
23 would work for different RF input signals; is that
24 right?

25 MR. HENDIFAR: Object to the form.

1 THE WITNESS: That's not what I said. What I
2 said, I haven't considered other possible -- or the
3 range of possible RF inputs that might work. I do note
4 that, in this example, it's ten 8-megahertz channels.

5 BY MR. KRONENTHAL:

6 Q Do you believe the Figure 2 example is fixed
7 for working with only this 80-megahertz RF input
8 signal?

9 MR. HENDIFAR: Object to the form.

10 THE WITNESS: Well, in the specification,
11 that's the example that's used.

12 BY MR. KRONENTHAL:

13 Q Would a person of ordinary skill in the art
14 design a system that is fixed for a specific RF input
15 signal of 80 megahertz?

16 A It depends on the system that the designer is
17 designing for.

18 Q A DFE in the '275 patent that is built for
19 four desired channels would also be able to handle an
20 input signal with five desired channels, too; right?

21 MR. HENDIFAR: Objection to form and scope.

22 THE WITNESS: I haven't considered how it
23 would work in that circumstance. I don't have an
24 opinion to express on that.

25 ///

1 BY MR. KRONENTHAL:

2 Q Sitting here today as an expert in the '275
3 patent, you don't know how the Figure 2 example would
4 work if there were five desired channels?

5 MR. HENDIFAR: Objection. Form and scope.

6 THE WITNESS: I did not say that.

7 BY MR. KRONENTHAL:

8 Q So how would it work if there were five
9 desired channels?

10 MR. HENDIFAR: Object to the form and scope.

11 THE WITNESS: I thought what I said was clear.
12 I do not have an opinion to express. I do not have an
13 opinion to express at this moment, and I don't recall
14 expressing that opinion in my report.

15 BY MR. KRONENTHAL:

16 Q Are you not able to give an opinion at this
17 moment?

18 A It would require study, and I would have to
19 understand more about the exact line of inquiry because
20 it's not a situation that's discussed in the '275
21 patent. So I am not able at this time to give an
22 opinion.

23 Q Do you think a person of ordinary skill in the
24 art of the '275 patent would understand how this
25 circuit in Figure 2 demultiplexes five desired

1 channels?

2 MR. HENDIFAR: Object to the form and scope.

3 THE WITNESS: I think it's outside the scope
4 of what's in the '275 patent. I mean, it's not a --
5 it's not a hypothetical that the '275 patent addresses.

6 BY MR. KRONENTHAL:

7 Q So, in your view, the '275 patent, Figure 2,
8 specifically only discloses using four desired
9 channels; is that correct?

10 MR. HENDIFAR: Object to the form and scope.

11 THE WITNESS: The way that I would put it is
12 the specification -- the verbiage in the specification
13 that describes Figure 2 makes it clear that in the
14 example in this specification, in the embodiment of the
15 specification, N equals the number of desired channels,
16 and the number of desired channels equals 4. That's
17 the example that's in the specification.

18 BY MR. KRONENTHAL:

19 Q And a POSITA would not have been able to use
20 the same example, Figure 2, from the specification to
21 demultiplex five desired channels; is that right?

22 MR. HENDIFAR: Object to the form and scope.

23 THE WITNESS: Well, in the example, there are
24 four mixer-filter chains, and so, in the example in
25 Figure 2, it's designed to output four desired

1 channels, and that's the limit of the disclosure in the
2 specification.

3 BY MR. KRONENTHAL:

4 Q So it's your opinion that a person of ordinary
5 skill in the art would not understand how to adapt this
6 example to deal with five desired channels; is that
7 right?

8 MR. HENDIFAR: Object to the form and scope.

9 THE WITNESS: I'm saying that's not a question
10 that I've considered.

11 BY MR. KRONENTHAL:

12 Q And you are unable to consider it right now?

13 A I am unwilling to express my opinion at this
14 moment because it would require careful study at the
15 specification end of the issues in this case.

16 Q And you studied the specification yesterday
17 for hours when you were preparing for this deposition.
18 No?

19 A That is correct.

20 Q Despite the hours that you spent studying for
21 this -- studying this specification in preparation for
22 this deposition, you are unable to answer my question
23 about whether the Figure 2 embodiment would work for
24 five desired channels; is that right?

25 MR. HENDIFAR: Object to the form and scope.

1 THE WITNESS: I am unwilling to express an
2 opinion. It would require careful time and study, and
3 I believe this matter deserves serious treatment. I'm
4 not going to come up with an off-the-cuff answer as I
5 sit here today.

6 BY MR. KRONENTHAL:

7 Q A POSITA would consider cost when deciding how
8 many multiplier-filter chains to put in a system;
9 correct?

10 MR. HENDIFAR: Objection. Form and scope.

11 THE WITNESS: Well, I mean, a POSITA is going
12 to consider the cost of everything inside a cable
13 set-top box. I mean, maybe.

14 BY MR. KRONENTHAL:

15 Q So, then, a POSITA would consider the costs
16 associated with the multiplier-filter chains in the
17 '275 patent's DFE; correct?

18 MR. HENDIFAR: Objection. Form and scope.

19 THE WITNESS: The -- I mean, a POSITA would
20 consider the cost of whatever she or he is designing.
21 Now, with respect to the '275, I would simply point out
22 it was designed to handle four desired channels. So it
23 seems like, in some sense, the decision was already
24 made.

25 ///

1 BY MR. KRONENTHAL:

2 Q So, in your view, a POSITA would not put a
3 fifth multiplier-filter chain into the DFE because four
4 desired channels are to be demultiplexed; is that
5 right?

6 MR. HENDIFAR: Objection to form and scope.

7 THE WITNESS: I just simply point out that,
8 for whatever reason, the number was set to four in the
9 example.

10 BY MR. KRONENTHAL:

11 Q Do you know why? what reason four was chosen?

12 A Not at the moment.

13 Q It would not make sense to limit the receiver
14 to work with only input signals that have a fixed
15 number of desired channels; right?

16 MR. HENDIFAR: Objection to form and scope.

17 THE WITNESS: I don't understand your
18 question.

19 BY MR. KRONENTHAL:

20 Q It would not make sense to a POSITA that the
21 Figure 2 embodiment would be designed to work with a
22 specific number of desired channels; right?

23 MR. HENDIFAR: Object to the form and scope.

24 THE WITNESS: I mean, I guess I don't
25 understand your question because systems are designed

1 specifically for some required number of desired
2 channels. I think that's quite common.

3 BY MR. KRONENTHAL:

4 Q And the number of desired channels can change
5 depending on what the user selects for output to the
6 demodulator for watching or recording; correct?

7 A Well, this is why I don't understand your
8 question. Are you talking about -- asking me about
9 what the system is designed for, or are you talking
10 about how the system is actually used in the field?

11 Q So this Figure 2 example of the '275 patent is
12 meant to be inside a person's home, for example; right?

13 A I think that's fair, yes.

14 Q And the number of desired channels would
15 depend on the user accessing the television channels
16 using this Figure 2 example; correct?

17 A Again, are you asking about what the unit is
18 designed for or how the unit is actually being used in
19 the field?

20 Q I'm not sure there's a different way to -- I'm
21 not seeing your difference.

22 So the number of multiplier-filter chains put
23 into the DFE is not going to be specific to the user;
24 correct?

25 MR. HENDIFAR: Objection to form.

1 THE WITNESS: If, by that, you mean two
2 different set-top boxes using the Figure 2 architecture
3 will have the same number of signal chains, I think
4 that's probably true.

5 BY MR. KRONENTHAL:

6 Q Yes. So we agree that the set-top box built
7 according to this Figure 2 example would be the same in
8 two different subscribers' homes; correct?

9 A I think that's potentially true, yes.

10 Q And those two different subscribers would have
11 different desired channels in some situations; correct?

12 A Right. And that's why each chain is designed
13 to select a desired channel because the desired channel
14 may change over time.

15 Q So how do you choose the number of
16 multiplier-filter chains that go into the DFE?

17 Is it based on cost, for example?

18 MR. HENDIFAR: Objection. Scope and form.

19 THE WITNESS: Well, it might potentially be
20 based on a lot of things.

21 BY MR. KRONENTHAL:

22 Q Is cost one of those considerations?

23 MR. HENDIFAR: Object to the form and scope.

24 THE WITNESS: I mean, I guess I haven't really
25 expressed my opinion on what drive the design is shown

1 here. It sounds like you are asking me to speculate;
2 but a person of ordinary skill would understand what
3 might be driving designs like this.

4 BY MR. KRONENTHAL:

5 Q Well, you've designed set-top boxes; correct?

6 A Yes.

7 Q In designing set-top boxes, would you have
8 considered the number of multiplier-filter chains to
9 put into the set-top box based upon the cost?

10 MR. HENDIFAR: Objection. Form.

11 THE WITNESS: We selected the number of
12 6-megahertz tuners based on the requirements and
13 subject to the constraint. It might have been cost.

14 BY MR. KRONENTHAL:

15 Q And that same consideration that went into
16 selecting the number of tuners would be the
17 consideration a person of ordinary skill in the art
18 would give when selecting the number of
19 multiplier-filter chains to go into the DFE in Figure 2
20 of the '275 patent; correct?

21 MR. HENDIFAR: Objection. Form and scope.

22 THE WITNESS: I haven't considered all of the
23 possible considerations that might go to -- might go
24 into it. Cost might be one, but there might be others
25 as well.

1 MR. HENDIFAR: Is it a good time for a break?

2 MR. KRONENTHAL: If you don't mind --

3 MR. HENDIFAR: Sure.

4 MR. KRONENTHAL: -- we can go for a little bit
5 longer.

6 THE WITNESS: Okay.

7 BY MR. KRONENTHAL:

8 Q Are you okay with that?

9 A Yes. Yeah. Uh-huh.

10 Q Let's look at Figure 2. Do you see the label
11 digital front end 230?

12 A I do.

13 Q The DFE label applies to the large dashed box
14 that is drawn around the bank of multipliers, filters,
15 and decimators; correct?

16 A Yes, I believe that's correct and includes the
17 output of the ADCs. Yes.

18 Q The '275 patent does not require the decimator
19 270 to be part of the DFE, though; correct?

20 I think the answer might help if you look at
21 Column 6, lines 13 to 19.

22 A Yes, the decimators that are labeled 270 in
23 the figure are optional.

24 Q The '275 patent does not limit the DFE to any
25 particular structure; correct?

1 MR. HENDIFAR: Objection to form and scope.

2 THE WITNESS: Well, it has to be -- I think
3 the way I'll answer the question is that the claim
4 structure constrains the structure of the digital front
5 end.

6 BY MR. KRONENTHAL:

7 Q But the patent itself doesn't provide a
8 specific structure that has to be used for a, quote,
9 DFE?

10 MR. HENDIFAR: Objection to form and scope.

11 THE WITNESS: Well, I think -- like I said, I
12 think the claims do require a specific -- sorry. It's
13 a method claim. So the claims require that the DFE
14 carry out --

15 My understanding of how method claim works is
16 the claim DFE has to carry out every step in the
17 method. So there are definitely constraints on how the
18 DFE -- on the method the DFE uses to carry out its
19 claim function.

20 BY MR. KRONENTHAL:

21 Q You would agree that the term "DFE" could
22 entail different circuitry in different receivers;
23 right?

24 MR. HENDIFAR: Objection to form and scope.

25 THE WITNESS: Well, I think the way I'll

1 answer it is what's relevant here is what is the claim
2 DFE. What are the steps and the method carried out by
3 the claim DFE? And I think it has very specific steps.

4 BY MR. KRONENTHAL:

5 Q And so, to be clear, I'm not asking about the
6 claims at the moment. I'm just wanting to know your
7 understanding of the term "DFE." Does that --

8 That could entail different circuitry in
9 different receivers; correct?

10 MR. HENDIFAR: Object to the form and scope.

11 THE WITNESS: I guess I don't understand your
12 question because I was tasked with exploring the scope
13 of the claims of the '275 patent. "DFE" is a claim
14 term, and so I think I'm obligated to understand what
15 the claim term means, and it's clear that the claim
16 term is constrained by the structure of the claim.

17 BY MR. KRONENTHAL:

18 Q And what exactly is that structure?

19 A And I apologize. I shouldn't say "structure."
20 Wrong patent. I should say "method." The DFE -- let's
21 see. It says [as read] "Selecting by a digital front
22 end DFE coupled to the ADC, the plurality of desired
23 channels from the digitized signal and outputting by
24 the DFE the selected plurality of desired channels to
25 at least one demodulator," and the claim then

1 continues.

2 So the claimed digital front end, which, as I
3 understand it, is the relevant question in this matter,
4 is one that satisfies those steps, that carries out
5 those steps and the method.

6 Q The claim doesn't require a particular number
7 of multiplier-filter chains; correct?

8 MR. HENDIFAR: Objection. Scope.

9 THE WITNESS: I mean, it refers to desired
10 channels. So there must be enough circuitry in the
11 digital front end to output the plurality of desired
12 channels -- the selected plurality of desired channels.

13 BY MR. KRONENTHAL:

14 Q The term "DFE" is not a term of art that tells
15 a person of ordinary skill in the art with absolute
16 certainty what the structure is; correct?

17 MR. HENDIFAR: Objection. Form and scope.

18 THE WITNESS: I think the way I would put it
19 is, in connection with the '275 patent, the claim term
20 "digital front end" is made clear by the structure of
21 the claim.

22 BY MR. KRONENTHAL:

23 Q And outside of the claims, there's nothing in
24 the patent, the '275 patent, that defines the structure
25 that's required by a digital front end; is that

1 correct?

2 MR. HENDIFAR: Objection. Scope.

3 THE WITNESS: I guess I don't understand your
4 question because what matters is what the claim says.
5 That's what's relevant here. And so the claims specify
6 whether digital -- the steps of a method that the
7 digital front end is supposed to carry out. And, you
8 know, a nonlimiting example of one is there in
9 Figure 2. I mean --

10 BY MR. KRONENTHAL:

11 Q Okay. So you agree that Figure 2 is a
12 nonlimiting example of a digital front end?

13 A Again, what matters is the claim structure,
14 and the claim structure has specific steps and a method
15 that definitely constrained what the claim digital
16 front end is.

17 Q And that doesn't answer my question because my
18 question was that you agree that Figure 2 is a
19 nonlimiting example of the digital front end?

20 MR. HENDIFAR: Objection. Scope. Form.

21 THE WITNESS: I'm going to have to modify my
22 answer, and I'm sorry. I shouldn't have used
23 "nonlimiting." What I meant to say is Figure 2 is an
24 example of a digital front end. What the digital front
25 end actually does in the context of this matter is

1 what's found in the claim language.

2 BY MR. KRONENTHAL:

3 Q So are you backtracking on your description --
4 characterization of the digital front end in Figure 2
5 as a nonlimiting example?

6 A Yes. I'm saying that it is an example, and I
7 apologize for misspeaking earlier, but what I meant to
8 say is that it is an example.

9 Q And how is that different from it being a
10 nonlimiting example?

11 A It -- what matters is not what's in Figure 2
12 in this sense. What matters is what's in the claim.
13 By that, I mean what the properties a digital front end
14 has to have in this matter. What's relevant is the
15 properties that are found in the claims.

16 Q Okay. So the DFE in the Claim 1, that doesn't
17 have to require what we exactly see in Figure 2; is
18 that right?

19 MR. HENDIFAR: Objection. Scope.

20 THE WITNESS: I would say that the claim
21 language actually constrains more tightly what a
22 digital front end can do. So a digital front end has
23 to satisfy the properties ascribed to it in the claims.
24 I haven't considered whether that's narrower or broader
25 than what's in Figure 2. I just know that what matters

1 is what's in the claims.

2 BY MR. KRONENTHAL:

3 Q Does the DFE in the Claim 1 require a
4 decimator?

5 MR. HENDIFAR: Objection. Scope.

6 THE WITNESS: It doesn't say that it does.

7 BY MR. KRONENTHAL:

8 Q Does the DFE in Claim 1 require a low-pass
9 filter?

10 MR. HENDIFAR: Objection. Scope.

11 THE WITNESS: The DFE is performing a
12 selecting step, and what matters is that it perform the
13 selecting step. A low-pass filter is known by a POSITA
14 as one way to do that; but the important thing is that
15 it performs a selected step. And, in fact, actually,
16 to be clear, selecting a plurality in that channel is
17 actually what's required in the digital front end, and
18 it has to be coupled to the ADC.

19 BY MR. KRONENTHAL:

20 Q I'm not sure that answers my question.

21 My questions was does the DFE in Claim 1
22 require a low-pass filter?

23 MR. HENDIFAR: Objection. Scope.

24 THE WITNESS: The digital front end of the
25 claims requires a selecting step. It requires

1 selecting a plurality of desired channels. That's what
2 the claim requires.

3 BY MR. KRONENTHAL:

4 Q And that doesn't require a low-pass filter to
5 do selection; correct?

6 MR. HENDIFAR: Objection. Scope.

7 THE WITNESS: The words on the page don't
8 require it as a practical matter. Well, the words on
9 the page don't require it.

10 BY MR. KRONENTHAL:

11 Q Does the DFE in Claim 1 require a multiplier?

12 MR. HENDIFAR: Objection. Scope.

13 THE WITNESS: I guess I don't understand your
14 question because Claim 1 speaks for itself. Claim 1
15 claims a digital front end. There's an example of a
16 digital front end found in Figure 2. In the example of
17 digital front end, it has multipliers and low-pass
18 filters. The claim requires the claim digital front
19 end be coupled to the ADC and select a plurality of
20 desired channels.

21 BY MR. KRONENTHAL:

22 Q And none of that language you just stated
23 right now mentions a multiplier; correct?

24 A The word "multiplier" does not appear in the
25 claim. That is correct.

1 Q So the DFE in Claim 1 does not require a
2 multiplier, in your view; is that right?

3 MR. HENDIFAR: Objection. Scope.

4 THE WITNESS: The digital front end in Claim 1
5 has to carry out the claim steps.

6 BY MR. KRONENTHAL:

7 Q And it can carry out that claim step without
8 using a multiplier; is that your view?

9 MR. HENDIFAR: Objection. Scope.

10 THE WITNESS: I did not say that.

11 BY MR. KRONENTHAL:

12 Q I didn't say you said it. I'm asking you if
13 that was your view.

14 MR. HENDIFAR: Objection. Scope.

15 THE WITNESS: My view is that the digital
16 front end that is claimed carries out the claim steps.

17 BY MR. KRONENTHAL:

18 Q And you can't tell me sitting here today
19 whether that claim step requires using a multiplier?

20 MR. HENDIFAR: Objection. Scope.

21 THE WITNESS: That's not an opinion that I
22 expressed in my report. That's not one I'm able to
23 express here at the moment. I do know that the example
24 in Figure 2, it requires multipliers and low-pass
25 filters, but the digital front end in the claim carries

1 out the steps in the claim.

2 BY MR. KRONENTHAL:

3 Q Does the DFE in the claim require the exact
4 structure that's shown in Figure 2?

5 MR. HENDIFAR: Objection. Scope.

6 THE WITNESS: I haven't expressed an opinion
7 as to all of the possible front ends that can exist. I
8 just know that they have to satisfy the claim steps.

9 BY MR. KRONENTHAL:

10 Q It would be fair to say that the term "DFE" in
11 at least some examples of the '275 patent just refers
12 to the digital circuitry before the demodulator; is
13 that right?

14 MR. HENDIFAR: Objection. Scope. Form.

15 THE WITNESS: I mean, I guess I don't
16 understand your question because I think the patent
17 figures speak for themselves. So in Figure 2, for
18 example, the digital front end is basically the dash
19 box number 230.

20 BY MR. KRONENTHAL:

21 Q And that's before the demodulator; correct?

22 A In the example of Figure 2, yes. The output
23 of the digital front end is output to a demodulator,
24 which is also consistent with the claim language.

25 Q So the claim just requires the digital front

1 end to be before the demodulator; is that right?

2 MR. HENDIFAR: Objection. Scope and form.

3 THE WITNESS: Well, the claim language says
4 "outputting by the DFE the selected plurality of the
5 desired channels to at least one demodulator." So the
6 output of the DFE is outputted to at least one
7 demodulator. That's the claim limitation.

8 BY MR. KRONENTHAL:

9 Q Yes. And all that requires is the digital
10 front end to be before the demodulator; right?

11 MR. HENDIFAR: Objection to form and scope.

12 THE WITNESS: I mean, if by "before" you mean
13 the digital front end outputs to the demodulator, yes.

14 BY MR. KRONENTHAL:

15 Q Figure 2 shows a single line coming out of the
16 DFE that would go to one or more demodulators; correct?

17 A Well, it says in Figure 2 "Serial or parallel
18 data interface to demodulator." So it uses
19 "demodulator" in the single, not in the plural, but
20 yes.

21 Q But it also shows just a single line coming
22 out of that DFE; correct?

23 A Yes, a serial or parallel data interface.

24 Q So we don't see from Figure 2 the one or more
25 demodulators, but they would be off to the right; is

1 that right?

2 A So the paragraph in Column 7, lines 16 through
3 25, explains that "the N desired baseband channels will
4 be sent as a serial or parallel digital data stream to
5 a modulator using a serial or parallel data interface
6 according to commonly known methods" as shown in
7 Figure 2. So that's the extent of the disclosure in
8 Figure 2. So the outputs are going to a demodulator.
9 The output of the DFE is going to the demodulator.

10 Q Yes. Okay. And looking at Figure 2 -- I just
11 want to make sure we are in agreement -- we are not
12 saying the demodulator in Figure 2?

13 A Yes, the demodulator is not in Figure 2. It's
14 referenced in the specification.

15 Q That single line represents -- I'm sorry.
16 Strike that.

17 The single line coming from the DFE and going
18 off to the right, that single line represents the
19 serial or parallel data interface to the demodulator;
20 correct?

21 A Yes. That's what the figure says, and it
22 clarifies that the N filter and designated baseband
23 channels are what are flowing over that area.

24 MR. HENDIFAR: Is it a good time for a break
25 now?

1 MR. KRONENTHAL: If you don't mind, a couple
2 more questions.

3 MR. HENDIFAR: Okay.

4 BY MR. KRONENTHAL:

5 Q For the multiple channels selected by the DFE
6 to be serial-output to one or more demodulators, the
7 DFE would have to include a device for putting the
8 multiple channels onto a single data bus; correct?

9 MR. HENDIFAR: Objection. Form and scope.

10 THE WITNESS: I mean, there is -- it
11 references commonly known methods for serial or
12 parallel data interface. So, yes, there's some manner
13 by which the N filtered and decimated baseband channels
14 are being sent over the serial or parallel data
15 interface to a demodulator.

16 BY MR. KRONENTHAL:

17 Q Okay. So we agree there would be some manner
18 of putting those multiple channels on a single line to
19 send them to the demodulator; correct?

20 A There would be some way to put them on the
21 serial or parallel data interface. It's drawn as one
22 line in the figure, but I don't think it's a constraint
23 of, like, one physical wire. It says "serial or
24 parallel data interface."

25 Q Yeah. So there will be some selection to put

1 the channels onto that one wire that we don't see in
2 this figure; is that right?

3 A I don't know what you mean by "selection."
4 There would be some contrivance by which the N filter
5 and decimated baseband channels would be put onto the
6 serial or parallel data interface to the demodulator.

7 Q And the circuitry that does that function of
8 putting the N filter and decimated baseband channels
9 onto a serial or parallel data interface could be
10 inside the DFE; is that correct?

11 MR. HENDIFAR: Objection. Scope.

12 THE WITNESS: I haven't considered whether
13 it's inside or outside the DFE. I just know that the
14 DFE has a serial or parallel data interface.

15 BY MR. KRONENTHAL:

16 Q And to put the multiple channels onto a serial
17 interface, there would have to be some type of selector
18 in the DFE; correct?

19 MR. HENDIFAR: Objection to form and scope.

20 THE WITNESS: I'm really not sure what you
21 mean by "selector." There would have to be a manner by
22 which the data was serialized.

23 BY MR. KRONENTHAL:

24 Q And that manner would have to be performed by
25 some circuitry in the DFE; correct?

1 MR. HENDIFAR: Objection. Scope and form.

2 THE WITNESS: It would have to be performed
3 somewhere.

4 BY MR. KRONENTHAL:

5 Q And that somewhere could be within the DFE;
6 correct?

7 MR. HENDIFAR: Objection. Scope and form.

8 THE WITNESS: I think the -- my -- I believe
9 the specification is silent on that subject.

10 BY MR. KRONENTHAL:

11 Q You would agree that a person of ordinary
12 skill in the art would see that as one option of this
13 Figure 2; correct?

14 MR. HENDIFAR: Objection. Scope and form.

15 THE WITNESS: It's not something I've
16 expressed an opinion on.

17 BY MR. KRONENTHAL:

18 Q I'm asking you to express an opinion now.

19 Would a person of ordinary skill in the art
20 understand that one option for selecting multiple
21 channels to put on a serial interface could be within
22 the DFE?

23 MR. HENDIFAR: Objection. Scope and form.

24 THE WITNESS: I am not prepared to create new
25 opinions on the fly during the deposition.

1 MR. KRONENTHAL: Okay. Why don't we take a
2 break now.

3 MR. HENDIFAR: Sure.

4 (Off the record.)

5 BY MR. KRONENTHAL:

6 Q So, in the Figure 2 example of the '275
7 patent, the RF input 102 includes ten channels;
8 correct?

9 A In the example in Figure 2, yes.

10 Q Four of those channels are desired channels,
11 as we spoke about before; correct?

12 A Correct.

13 Q It is the DFE that selects the four desired
14 channels from the RF input 102; correct?

15 A Well, it selects it -- selection is performed
16 by the DFE, and it's coupled to the ADC, so technically
17 selecting from the output of the ADCs.

18 Q And the digital signal output from the ADC is
19 from the RF input 102; correct?

20 A Ultimately, yes. Correct.

21 Q Can we please turn to Column 5, lines 56 to
22 60, of the '275 patent.

23 A Okay.

24 Q The '275 patent describes N as "an integer
25 value corresponding to the number of desired RF

1 channels"; correct?

2 A Yes. At line 58 and following, "N is an
3 integer value corresponding to the number of desired
4 RF channels located in the non-contiguous portions of
5 the frequency spectrum BW1."

6 Q And the '275 patent also states that it would
7 be any integer value; correct?

8 A Yes.

9 Q And that is a normal understanding a POSITA
10 would have when N is used; correct?

11 A Correct.

12 MR. HENDIFAR: Object to form.

13 BY MR. KRONENTHAL:

14 Q And beginning on Column 5, line 61, the patent
15 states: "In one embodiment, N can be equal to the
16 number of all available channels that exist in the
17 licensed frequency spectrum to provide system
18 flexibility."

19 Do you see that?

20 A Right. That is an ultimate embodiment that N
21 can be equal to a number of all available channels.
22 Yes.

23 Q But Claim 1 doesn't -- does not exclude this
24 embodiment; right?

25 A Well, Claim 1 talks about desired channels,

1 and so I would say that Claim 1 does include that
2 embodiment because the patent does talk about desired
3 channels and Claim 1 requires desired channels.

4 Q And N represents the number of desired RF
5 channels; is that right?

6 MR. HENDIFAR: Objection to form.

7 THE WITNESS: According to line 58, yes, "N is
8 an integer value corresponding to the number of desired
9 RF channels."

10 BY MR. KRONENTHAL:

11 Q And then that same -- what you said,
12 alternative embodiment starting on line 61, that uses
13 the same N; correct?

14 A Right. In one embodiment, so we are saying
15 that N is an integer value. In one embodiment, N is an
16 integer value corresponding to the number of desired RF
17 channels. In another embodiment, N can be equal to the
18 number of all available channels.

19 So we know which one is being discussed in
20 Claim 1 because of the specific reference to "desired
21 RF channels."

22 Q So is it your view that the N in line 62
23 doesn't represent desired channels?

24 A Yes, because of the definition of "desired
25 channels" found, for example, at Column 1, line 55.

1 Q So, in your view, the definition of N as an
2 integer value corresponding to the number of desired RF
3 channels located in the noncontiguous portions of the
4 RF -- I'm sorry. Strike that. I misspoke.

5 In your view, the definition of "N is an
6 integer value corresponding to the number of desired RF
7 channels located in the non-contiguous portions of the
8 frequency spectrum BW1" does not apply to the N that is
9 recited on line 62 where it says "N can be equal to the
10 number of all available channels that exist in the
11 licensed frequency spectrum"?

12 A I would say -- right -- that that is a
13 different embodiment because Column 1, line 55, talks
14 about desired channels as being channels -- well,
15 explain what desired channels are.

16 And so, clearly, what's being -- it's clear in
17 my mind, and I think it would be clear to a POSITA that
18 the definition starting at line 62 is talking about
19 something different, not desired channels, but all
20 available channels.

21 Q So, in your view, line 62 redefines N?

22 A I think it's fair to say that the patent
23 specification has different definitions of N and
24 different embodiments, and the one that is relevant
25 here is the one that calls out desired channels. The

1 clause "desired channels" is a claim term, and because
2 it's a claim term, it makes it clear that the scope of
3 the claim is the embodiment where N is an integer value
4 corresponding to the number of desired RF channels.

5 Q So to be clear, in your view, Claim 1 of the
6 '275 patent excludes the embodiment in Column 5, lines
7 61 through 66?

8 A Yes, because the claim requires desired
9 channels and those two definitions do not reference
10 desired channels. So those two definitions are at
11 least not necessarily relevant, and I believe that they
12 are not relevant. There's no internal indication in
13 the specification that they are relevant because they
14 lack any reference to the concept of desired. And so,
15 again, this is a limitation that arises from the claim
16 language.

17 Q Starting on line 64 of Column 5, it says "In
18 other embodiments, N can be equal to the number of all
19 receivable channels within a geographic area."

20 Do you see that?

21 A I think it says "less than the number of
22 receivable channels with the geographic area to reduce
23 system costs." Oh. Oh, I'm sorry. You are at the
24 sentence above that.

25 Q Yes.

1 A Let me start over. I apologize. So, starting
2 at line 64, the specification says "In other
3 embodiments, N can be equal to the number of all
4 receivable channels within a geographic area." It
5 continues to say "In yet another embodiment, N can be
6 an integer value less than the number of receivable
7 channels with the geographic area to reduce system
8 costs."

9 So the specification makes clear that N can be
10 defined several different ways, and the claims make
11 clear that it's the definition that includes the
12 concept of desire that is relevant.

13 Q Okay. So, in your opinion, the specification
14 is described in one, two, three, four different
15 embodiments?

16 A Let's see. "N is an integer value
17 corresponding to the number of desired RF channels" is
18 one embodiment. Another embodiment is "In one
19 embodiment, N can be equal to the number of all
20 receivable channels." And "In other embodiments, N can
21 be equal to the number of all receivable channels.

22 So, yes, I would say that there are four
23 embodiments.

24 Q And in your view, Claim 1 excludes all but the
25 first embodiment?

1 A The way I would put it is that only the
2 first -- the first embodiment is the only one that we
3 know that's covered by the claims because it is the
4 only definition that makes reference to "desired
5 channels."

6 Q Okay. So the claim covers the first
7 embodiment, but does it exclude the other three
8 embodiments?

9 A I believe that it does because of the
10 definition of "desired." Well, to be clear, the last
11 one talks about less than the number, but we don't
12 really know what that means. The point is the claims
13 require access to desired channels, and so I would
14 mistrust any definition of N that does not make
15 reference to desired channels because it is a claim
16 requirement.

17 The specifications can be broader than the
18 claims, and the claims can narrow the scope; and in
19 this case, they do because they reference desired
20 channels.

21 Q Is it your view that a user cannot desire all
22 receivable channels within a geographic area?

23 A I think the definition of "desired channels"
24 is simply made clear there in Column 1 that, you know,
25 you've got -- and so it's the channels that are being

1 demodulated.

2 Q And can those channels that are being
3 demodulated be all receivable channels?

4 A Well, I would say no. I mean, that's the
5 entire point of the patent is -- let me back up. Let
6 me start over.

7 I would say the answer is no.

8 Q So, in your view, a user cannot desire all
9 receivable channels; is that right?

10 MR. HENDIFAR: Object to the form.

11 THE WITNESS: I think the way I would put it
12 is the -- in the affirmative definition given in the
13 patent, it is -- desired channels are the ones that
14 were being demodulated, and in the example in the
15 patent, it is a -- RF channels located in the
16 noncontiguous portion. So these are a cell set of the
17 RF channels.

18 BY MR. KRONENTHAL:

19 Q So you read Claim 1 as excluding three of the
20 four embodiments in the '275 patent; is that right?

21 A Because they do not reference desired
22 channels, I would agree with that, yes, because Claim 1
23 requires desired and undesired channels and that is the
24 only definition of N in the specification that makes
25 reference to desired channels.

1 Q Okay. Do you have the Zhang reference in
2 front of you?

3 A I have it somewhere.

4 Q I can provide --

5 A I have it. I just have to dig it out. And to
6 be clear, Counselor, I assume you mean the patent
7 application Zhang, not the patent Zhang; right?

8 Q Yes. I'm talking about U.S. Patent
9 Publication No. 2003/0056221.

10 A Right.

11 Q Okay.

12 A And it's cut off, but I think that's marked
13 Comcast 1013.

14 Q Correct.

15 A That's what I have, yes.

16 (Deposition Exhibit 1013 was previously
17 marked and is attached hereto.)

18 BY MR. KRONENTHAL:

19 Q And if I refer to "Zhang" in this deposition,
20 you will understand that I'm referring to U.S. Patent
21 Publication No. 2003/0056221 --

22 A Yes.

23 Q -- which is Exhibit 1013?

24 A Right. Right.

25 Q So we will only call Exhibit 1013 "Zhang."

1 A Yes. There is a -- just to be clear for the
2 record, there is this later issue. There's a patent
3 that shows up later in the case; but unless we
4 specifically call it out, we'll be talking about the
5 patent application, not the patent. Yes, I understand
6 that.

7 Q Great. Okay. I don't have plans to talk
8 about the other Zhang patent.

9 A Okay. Again, I just wanted the record to be
10 clear. Thank you, Counselor.

11 Q If you could, turn to Figure 2 of Zhang.

12 A Okay.

13 Q In Figure 2, Zhang shows a block 210 receiving
14 an RF signal; correct?

15 A Yes.

16 Q Block 210 in Figure 2 is a frequency block
17 down-converter; correct?

18 A Yes. And bandpass filter, yes.

19 Q Yes. It shows the bandpass filter 212 inside
20 the box 210; correct?

21 A Correct.

22 Q The output of block 210 is input to a
23 high-speed analog-to-digital converter, 220; correct?

24 A Correct.

25 Q Is it okay if we refer to the 220 as an ADC?

1 A Yes.

2 Q The output of the ADC 220 is input to a
3 demultiplexer 230; correct?

4 A Correct. Digital channel demux 230. And
5 "demux" is short for "demultiplexer." That is correct.

6 Q And the demultiplexer 230 outputs to Channels
7 C1to Cn to a selector 240; correct?

8 A Correct.

9 Q And selector 240 outputs Channels D1 to Dm to
10 demodulators 250(1) to 250(m); correct?

11 A Correct.

12 Q Let's turn to Claim 1 of the '275 patent.

13 A Oh, yes. Let me get it back out. Okay. I
14 have it here.

15 Q Do you see the first receiving step?

16 A Yes.

17 Q And it mentions an input signal comprising
18 broadcast channels; correct?

19 A Correct.

20 Q Now referring back to Figure 2 of Zhang, you
21 do not dispute that the RF signal of the input of
22 Zhang's block 210 meets the input signal comprising
23 broadcast channels in Claim 1 of the '275 patent;
24 correct?

25 MR. HENDIFAR: Objection. Scope.

1 THE WITNESS: I don't think I expressed an
2 opinion as to whether it did or not, but I don't -- I
3 don't think I addressed it in the report, if that's
4 what you mean.

5 BY MR. KRONENTHAL:

6 Q So you didn't consider whether Zhang's RF
7 input signal in Figure 2 teaches the claimed input
8 signal comprising broadcast channels of Claim 1 of the
9 '275 patent?

10 MR. HENDIFAR: Objection. Scope.

11 THE WITNESS: I considered it. I just did not
12 express an opinion on it.

13 BY MR. KRONENTHAL:

14 Q Do you have an opinion now?

15 A No. And, again, that's based on my offhand
16 recollection of the report. If there is an opinion in
17 there, I don't recall, you know. I always have the
18 right to refresh my recollection, but my recollection
19 is I did not express an opinion on that.

20 Q That's my understanding, too, and that you
21 didn't -- since you didn't address it, you didn't
22 dispute it; is that right?

23 A I guess that's right. It sounds likely. You
24 are using legal terms; but I did not address it, and,
25 therefore, I think you are right. I think, for

1 reasons, I did not dispute it.

2 Q You would agree that Zhang's RF input signal
3 in Figure 2 is an RF signal that comprises broadcast
4 channels; correct?

5 MR. HENDIFAR: Objection. Scope.

6 THE WITNESS: Well, in the -- well, let's see.
7 Let's see what Zhang says. I mean, in the only example
8 in Zhang that we have -- let's see -- it's a
9 multichannel RF signal with 35 RF channels, C1 to C35.
10 So that's an example in Zhang is 35 contiguous RF
11 channels. That's the RF input shown there -- the RF
12 signal -- excuse me -- the RF signal in Figure 2. Yes.
13 BY MR. KRONENTHAL:

14 Q Are you referring to -- are you looking at
15 Figure 6?

16 A I'm referring to paragraph 42.

17 Q Oh, okay. I'll refer you to paragraph 23,
18 which describes the Figure 2 that we were looking at.

19 A Okay.

20 Q And in paragraph 23, it talks about "A
21 frequency-block down-converter 210 receives one or more
22 multi-channel analog RF signals which can be sourced by
23 a variety of systems such as satellite systems,
24 terrestrial TV systems, cable systems, etc."

25 Do you see that?

1 A I do.

2 Q So you would agree that Zhang's block 210
3 receives an RF signal that comprises broadcast
4 channels; correct?

5 A Yes. And, again, the example in paragraph 42,
6 I think, is echoing the same sentiment. Yes.

7 Q Okay. And the RF signal in Figure 2 of Zhang
8 would include multiple channels; correct?

9 A The -- it would contain multiple RF channels,
10 yes; for example, 6-megahertz RF channels, yes.

11 MR. HENDIFAR: Just FYI, in about five
12 minutes, lunch will be here, less than five.

13 MR. KRONENTHAL: Okay.

14 BY MR. KRONENTHAL:

15 Q If we could pull up the U.S. Frequency
16 Allocations chart and look at page 2.

17 A Okay.

18 Q A signal with the frequencies from
19 50 megahertz to 117.975 megahertz would be one example
20 of the RF signal in Figure 2; correct?

21 MR. HENDIFAR: Objection. Scope.

22 THE WITNESS: I guess I don't understand your
23 question because the only example that's in -- actually
24 in Zhang spans 540 through 750 megahertz. So that's
25 the only express example in Zhang. That's the only

1 expressly disclosed example in Zhang.

2 BY MR. KRONENTHAL:

3 Q Is it your view that Zhang is limited to that
4 one example?

5 A No. I'm just saying that that's the only
6 example found in Zhang.

7 Q And I'm asking if the RF signal in Figure 2 of
8 Zhang would include, as one example, the frequency
9 spectrum that we see on page 2 of Exhibit 1086.

10 A And to be clear, you said spanning 54 to
11 117.975?

12 Q Sure. Yes.

13 A I don't know. I haven't -- I don't -- I don't
14 know. I haven't speculated as to what might be an
15 input to Zhang. I'm working on what Zhang itself says.

16 Q And I'm -- if we could, go to paragraph 23 of
17 Zhang. He describes again that "The down-converter 210
18 receives one or more multi-channel RF signals which can
19 be sourced by a variety of systems," and that includes
20 terrestrial TV systems; correct?

21 A Yes. And I want to make clear, a POSITA would
22 understand any moment in time is connected to one of
23 those. It is connected to a satellite system or a
24 terrestrial TV system or in a cable system.

25 Q And in one system -- let's take a terrestrial

1 TV system, for example -- that system would include
2 receiving an RF signal from 54 megahertz to the
3 117.975 megahertz; is that right?

4 MR. HENDIFAR: Objection. Scope and form.

5 THE WITNESS: Well, I don't know. I haven't
6 expressed an opinion as to what Zhang might do,
7 although I would find it a little confusing that a
8 television design to receive terrestrial TV, I don't
9 know why -- I mean, it would be designed to access
10 channels in the range 54 to 88 megahertz because those
11 are the only channels -- that's the only frequency
12 range licensed for over-the-air, terrestrial
13 transmission.

14 BY MR. KRONENTHAL:

15 Q Okay. So you would agree, though, that one
16 example of Zhang's Figure 2 could receive an RF
17 signal with a signal from 54 megahertz to 88 megahertz;
18 correct?

19 A I haven't -- I haven't speculated as to the
20 range of possible inputs to Zhang. I just know, in the
21 one example it has, it's 54 to 750 megahertz, and it's
22 35 6-megahertz channels.

23 Q There's nothing in paragraph 23 of Zhang that
24 limits what the RF signal to the down-converter 210 has
25 to be, is there?

1 A Well, it says it can be a satellite system,
2 terrestrial TV system, or cable system; but it doesn't
3 specify beyond that. And, again, the only actual
4 example that's expressly disclosed is the one I
5 mentioned earlier of 540 to 750.

6 Q And that one you are referencing is with
7 regard to Figure 6 -- correct? -- of Zhang.

8 A Well, it's in the context of Figure 6, but I
9 point out, it's the only example found in the entire
10 application.

11 MR. KRONENTHAL: Let's go off.

12 (Off the record.)

13 BY MR. KRONENTHAL:

14 Q Okay. So, before we went on the break, I was
15 referring to that page 2 of Exhibit 1086.

16 A Yes.

17 Q And we talked about -- so there are some
18 television Channels 2 through 4 and 5 through 6 that
19 are within that frequency band of 54 to 88 megahertz;
20 correct?

21 A Correct.

22 Q So, in a hypothetical, suppose an RF signal
23 input into Zhang's Figure 2 is, for example, this 54 to
24 88 megahertz. Are you with me?

25 A I am.

1 Q In that example, Zhang's C1 through Cn would be
2 a subset of the channels in the RF input signal;
3 correct?

4 MR. HENDIFAR: Objection. Form.

5 THE WITNESS: I don't understand your
6 question. I guess the answer is no because there
7 are -- let's see -- two, three, four -- there are five
8 channels in that band.

9 BY MR. KRONENTHAL:

10 Q There would be channels in the section of the
11 band between 72 and 76 megahertz; correct?

12 MR. HENDIFAR: Object to the form and scope.

13 THE WITNESS: The figure makes clear that
14 there are no channels in that band.

15 BY MR. KRONENTHAL:

16 Q You mean no television channels; is that
17 right?

18 A Well, I guess maybe I didn't understand your
19 question. What did you mean by "channel"?

20 I was assuming television channel. So what
21 did you mean when you said "channel"?

22 Q So I'm referring to, when I mean "channel,"
23 frequencies at which information would be communicated.
24 So let me ask a different question. Hold on.

25 In my hypothetical of Zhang having an RF input

1 signal from 54 megahertz to 88 megahertz, you would
2 agree that Zhang's C1 through Cn would include only the
3 channels between 54 and 72 megahertz and 76 and 88
4 megahertz; is that right?

5 A Well --

6 MR. HENDIFAR: Object to the form and scope.

7 THE WITNESS: -- first off, you are talking
8 about a hypothetical that Zhang does not address. So
9 you are skating past what Zhang discloses, and so the
10 hypothetical is forced to disclose about this
11 situation. Secondly, a person of ordinary skill,
12 picking up Zhang, would understand that a channel is a
13 television channel. There's just no basis for saying
14 that it's anything else.

15 I mean, I know that the term "channel" is used
16 in the art to mean a lot of different things; but, for
17 example, Zhang says a given RF channel carries one or
18 more content channels. RF channel can carry one or
19 more content channels. RF channel can provide a
20 variety of data streams.

21 So Zhang itself, when it talks about a
22 channel, it's talking about a television channel pretty
23 clearly, and I don't think a person of ordinary skill
24 in the art would say that Zhang is talking about both
25 television channels and CB radio channels, for example.

1 That just wouldn't make any sense. So that's why --
2 that's why I answered the question the way that I did.

3 BY MR. KRONENTHAL:

4 Q Okay. You would agree that, in my
5 hypothetical, Zhang's C1 through Cn would not include
6 the information on the frequencies that are not
7 allocated for television channels; correct?

8 A I don't know. I don't know how Zhang would
9 address that. Zhang doesn't say.

10 Q So, in your view, C1 through Cn would include
11 aeronautical navigation channels, possibly?

12 A No. I'm saying the exact opposite. I'm
13 saying I don't know how Zhang would handle that
14 situation. Zhang is silent on the subject. The only
15 example we have in Zhang is of 35 contiguous
16 6-megahertz TV channels. So saying what would happen
17 between 72 and 76 megahertz in the context of Zhang
18 would be speculation.

19 Q So, sitting here today, you are not sure how
20 Zhang would process an RF input signal from 54 to 88
21 megahertz?

22 A I am sure that Zhang does not discuss it. I
23 am sure that there's no basis for making any specific
24 conclusion about it because it is not discussed in
25 Zhang, and any opinion about that would be speculation

1 past the end of what Zhang discloses. As far as I
2 know, everything I have just said is a fact.

3 Q So, in your view, Zhang is silent on how the
4 demultiplexer processes the frequencies between 72 and
5 76 megahertz; is that right?

6 A Zhang is silent on the subject.

7 Q In my hypothetical example where Zhang's RF
8 input signal is from 54 to 88 megahertz, how many
9 C1 through Cn channels would Zhang produce?

10 MR. HENDIFAR: Object to the form.

11 THE WITNESS: I don't understand. What do you
12 mean by "channels"?

13 BY MR. KRONENTHAL:

14 Q How many television channels would Zhang's
15 demultiplexer produce when outputting C1 through Cn?

16 MR. HENDIFAR: Object to the form.

17 MR. KRONENTHAL: Let me strike the question.
18 Let me ask.

19 BY MR. KRONENTHAL:

20 Q You agree that Zhang's C1 through Cn channels
21 are television channels; correct?

22 A I think a person of ordinary skill would read
23 Zhang that way, yes, content channels that are used by
24 a subscriber, for example. That's paragraph 28. So,
25 yes, I think, generally speaking, the C's are

1 television channels -- I mean, 6-megahertz chunks of
2 bandwidth that contain television channels.

3 Q And you would agree that C1 through Cn do not
4 include aeronautical radio navigation channels;
5 correct?

6 A I would agree with that, yes, in the examples
7 of Zhang we know; right.

8 Q Let's turn to paragraph 23 of Zhang.

9 A Okay.

10 Q In paragraph 23 of Zhang, he mentions the
11 different variety of systems that his system in
12 Figure 2 works with; correct?

13 A Right. It's capable of receipt -- well, I
14 said literally "receives one or more multi-channel RF
15 signals which can be sourced by a variety of systems
16 such as satellite systems, terrestrial TV systems,
17 cable systems, etc."

18 Q So you would agree that Zhang's system would
19 be built for a variety of systems; correct?

20 A I think the way I would put it is that Zhang's
21 system would apply to a system built for satellite, it
22 would apply to a system built for terrestrial TV, and
23 it would apply to a system built for cable. Whether or
24 not it supported multiple of those at the same time,
25 Zhang doesn't really say.

1 Q You would agree that Zhang does not require a
2 system to be customized specifically for only one
3 geographical area; correct?

4 MR. HENDIFAR: Object to the form.

5 THE WITNESS: Well, no, I would not agree with
6 that.

7 BY MR. KRONENTHAL:

8 Q So, in your opinion, Zhang's Figure 2 example
9 would be customized for a specific geographical area;
10 is that right?

11 MR. HENDIFAR: Object to the form.

12 THE WITNESS: I mean, for example, you'd have
13 to decide whether to use the 6- or 8-megahertz channel,
14 which is geographically constrained. And the example
15 in Zhang is 6 megahertz. So the example in Zhang is
16 for North American channels.

17 BY MR. KRONENTHAL:

18 Q Okay. You would agree that Zhang would have
19 wanted his system to be deployed in multiple
20 geographical areas across the U.S.; correct?

21 MR. HENDIFAR: Objection. Foundation.

22 THE WITNESS: Zhang says what Zhang says. I
23 haven't considered all of the possible places where it
24 might be used.

25 ///

1 BY MR. KRONENTHAL:

2 Q A person of ordinary skill in the art,
3 building Zhang's system in example Figure 2, would have
4 built it so that it could be deployed in multiple
5 geographic areas across the U.S.; correct?

6 MR. HENDIFAR: Object to the form.

7 THE WITNESS: I mean, they might have. I
8 don't know.

9 BY MR. KRONENTHAL:

10 Q They would have wanted --

11 A They might have. I have not expressed an
12 opinion on that is what I meant to say.

13 Q Would you agree that they would have wanted
14 to, for example, to keep costs down?

15 MR. HENDIFAR: Object to the form.

16 THE WITNESS: I haven't expressed an opinion
17 on that. I haven't analyzed it. I don't know why it
18 would keep costs down.

19 BY MR. KRONENTHAL:

20 Q In your view, Zhang -- strike that.

21 In your view, a person of ordinary skill in
22 the art aiming to build the system in Figure 2 of Zhang
23 would build that system specifically for one city
24 within the U.S.; is that right?

25 MR. HENDIFAR: Objection to form.

1 THE WITNESS: No, I didn't say that.

2 BY MR. KRONENTHAL:

3 Q So you would agree that a person of ordinary
4 skill in the art aiming to build a system in Figure 2
5 of Zhang would build that system for multiple cities in
6 the U.S.; correct?

7 MR. HENDIFAR: Object to the form.

8 THE WITNESS: Again, this is -- I'm not sure
9 why this is -- I have not expressed an opinion on this.
10 I don't know -- I don't see where this question arises
11 from the matters that are in dispute here. So I have
12 not expressed an opinion on it.

13 BY MR. KRONENTHAL:

14 Q And you have no opinion sitting here today?

15 A I have no opinion sitting here today.

16 Q You are not able to answer that question, what
17 a person of ordinary skill in the art would believe
18 about how the system of Zhang would be built?

19 MR. HENDIFAR: Objection to the form.

20 THE WITNESS: If by how it would be built you
21 mean what geographic area it could be used in, again, I
22 am unwilling to express an opinion on that at this
23 moment.

24 BY MR. KRONENTHAL:

25 Q Nothing in Zhang requires its system to be

1 customized specifically for only one city; correct?

2 MR. HENDIFAR: Object to the form.

3 THE WITNESS: I haven't considered it. I
4 mean, I know the example in Zhang 5 -- well, I haven't
5 considered it. I don't know.

6 BY MR. KRONENTHAL:

7 Q Nothing in Zhang --

8 A Sorry. I didn't mean to say "I don't know."
9 What I meant to say is I didn't have an opinion on
10 that.

11 Q Nothing in Zhang requires its system to be
12 customized specifically for one cable network provider;
13 correct?

14 MR. HENDIFAR: Object to the form.

15 THE WITNESS: I don't know. I mean, I
16 don't -- sorry. I don't -- I misspoke. I do not have
17 an opinion on that.

18 BY MR. KRONENTHAL:

19 Q You can't point me to something in Zhang that
20 indicates customization for a specific cable network
21 provider, can you?

22 A Well, the example in Zhang is shown to work
23 between 540 and 750 megahertz. That's a specific
24 example, and that's, of course, 35 6-megahertz
25 channels. So, I mean, the example in Zhang seems

1 pretty specific.

2 Q And are all cable network providers required
3 to use the 540 to 750 megahertz bandwidth?

4 A I mean -- well, no, and that's my point.
5 Zhang has been built for this specific arrangement.

6 Q You agree Figure 6 is just one example of
7 Zhang; correct?

8 A Yes. All I'm saying is the only express
9 disclosure of the types of bandwidth Zhang contemplates
10 is in paragraph 41 and 42.

11 Q A person of ordinary skill in the art,
12 building Zhang's system, would have wanted a single
13 implementation of the system to be compatible with
14 multiple cable networks; correct?

15 MR. HENDIFAR: Object to the form.

16 THE WITNESS: I don't know.

17 BY MR. KRONENTHAL:

18 Q Let's look at paragraph 24 of Zhang.

19 A And, again, I'm sorry. I didn't mean to say
20 "I don't know." I meant to say I don't have an opinion
21 on that.

22 Q Okay. In paragraph 24, Zhang explains that
23 the input analog signal can have various frequencies
24 from very low frequencies to tremendously high
25 frequencies; correct?

1 A Yes. That's what it says in paragraph 24.

2 Q You would agree that Zhang's system is
3 intended to receive a wide range of frequencies at its
4 input signal; correct?

5 A Well, I think the way I would put it, it is
6 clearly designed to input a bounded set of frequencies
7 to its input where the bandwidth is limited by the end
8 lock digital converter. And so that's why, in the
9 example, there's a 210-megahertz example in the
10 specification. So, in that case, the high speed A to D
11 has been designed to work with 210 megahertz of
12 bandwidth.

13 Q Okay. Thank you. Let's turn to paragraph 25
14 of Zhang. This paragraph 25 of Zhang discusses the
15 down converter 210; correct?

16 A Yes.

17 Q And in paragraph 25, Zhang explains that the
18 down converter 210 downshifts frequencies in the analog
19 signal; correct?

20 A Yes.

21 Q Also in paragraph 25, Zhang explains that
22 "frequencies are lowered so that subsequent stages can
23 better process the signal"; correct?

24 A Correct.

25 Q Zhang then gives an example where he explains

1 that frequencies are lowered so that a pair of
2 300-megahertz ADCs can be used.

3 Do you see that?

4 A So it can be processed by a pair of 300
5 megahertz or by a single 600 megahertz of ADCs, yes.

6 Q And "ADC" stands for "analog-to-digital
7 converter"; correct?

8 A Correct.

9 Q And a POSITA would have been familiar with
10 analog-to-digital converters; correct?

11 A Correct.

12 Q Analog-to-digital converters would have been
13 available for off-the-shelf circuit components in 2001
14 when Zhang was filed; correct?

15 A Correct.

16 Q And analog-to-digital converters convert
17 analog signals to digital signals by sampling analog
18 signals; is that correct?

19 A That's correct.

20 Q And different analog-to-digital converters
21 have different sampling rates; correct?

22 A Correct.

23 Q And ADC that samples at a greater sampling
24 rate than another ADC would be considered to have a
25 higher speed; correct?

1 A That's correct. At this point, I've got to
2 put in, it sounds to me like you are asking me about
3 the opinions that I expressed in the Entropic
4 litigation. So I just wanted to make sure that's not
5 the case.

6 Q I'm actually not sure what you are talking
7 about, but --

8 A Okay. All right. So -- so the opinions I
9 expressed here are connected to this case and not to
10 the litigation. All right. So please continue.

11 Q Would your opinions be different if I was
12 asking about the litigation?

13 A No.

14 Q A POSITA would have been familiar with the
15 Nyquist rate; correct?

16 A Yes.

17 Q And the Nyquist rate is a value equal to twice
18 the highest frequency of a signal and is the minimum
19 sampling rate needed for an ADC to convert an analog
20 signal to a digital signal without distortion; is that
21 correct?

22 A It's twice the band limit of the signal and --
23 yes, I think it's -- yes. It's a good general
24 definition of Nyquist, yes.

25 Q Not all ADCs can convert any analog signal to

1 a digital signal; correct?

2 MR. HENDIFAR: Object to the form.

3 THE WITNESS: Well, if the goal is to be able
4 to reconstruct the original analog signal correctly,
5 that is correct.

6 BY MR. KRONENTHAL:

7 Q So an ADC must be specifically designed to
8 properly convert a certain range of frequencies to a
9 digital signal; correct?

10 A If the goal is to convert a certain range of
11 frequencies, yes, the ADC must be designed specifically
12 for that range of frequencies. That is correct.

13 Q And the wider the range of frequencies, the
14 higher the speed of sampling that is needed for the
15 ADC; correct?

16 A That is correct.

17 Q You agree that Zhang's system receives a wide
18 range of frequencies at its input signal and would
19 therefore be attempting to convert a wide range of
20 frequencies into a digital signal; correct?

21 MR. HENDIFAR: Objection to form and scope.

22 THE WITNESS: That's why, for example, they
23 have a 200- -- they have a 210-megahertz example in the
24 specification. So, in that example, the ADC would
25 be -- would have to be fast enough to convert the

1 210-megahertz signal, yes.

2 BY MR. KRONENTHAL:

3 Q You are referring again to the Figure 6
4 example; is that right?

5 A I'm referring to the paragraph 41 and 42
6 example.

7 Q Yes. Which discusses the Figure 6; correct?

8 A Well, I think that's the context. And, again,
9 I'm referring to it because it's the only example in
10 Zhang.

11 Q Paragraph 25 discusses a pair of 300-megahertz
12 analog-to-digital converters; correct?

13 A Right. Correct. Now, that's because the band
14 limit is 300 megahertz.

15 Q So Zhang would need an ADC design to have a
16 sufficiently high sampling speed in order to digitize
17 the input analog signal; correct?

18 A In order to process the desired subset of that
19 signal, yes. I'm sorry. "Desire" is not the right
20 word. "Desire" is a claim term. Zhang expressly
21 contemplates -- well, let's -- let me -- if we were
22 referring to Figure 2, the digital channel demux is
23 going to demultiplex the channels that are applied to
24 it. The ADC therefore has to output enough to supply
25 the demux with all of the channels that it needs, and

1 so that has to line up. The ADC has to be at least
2 fast enough to generate information that can be
3 demultiplexed into the n channels of Figure 2.

4 Q And so please turn to paragraph 27 of Zhang.
5 The second line of paragraph 27 of Zhang says "In this
6 specific embodiment, ADC 220 is a high-speed ADC so
7 that an entire signal band with n channels can be
8 converted"; correct?

9 A Correct.

10 Q And in this, Zhang is describing the need for
11 the ADC to digitally convert an analog signal that has
12 a wide range of frequencies; correct?

13 A For example, n can be equal to 35, and the
14 bandwidth can be equal to 210 megahertz as described
15 below.

16 Q Let's turn to paragraph 51 of your
17 declaration. In paragraph 51, you state "The letter
18 'n' in Zhang denotes the number of channels...in the
19 'entire signal band'; correct?

20 A Correct. And my basis for saying that is the
21 quote below.

22 Q And paragraph 27 is the only support that you
23 cited for that statement; correct?

24 A It is the only one cited there in the -- cited
25 there. It's the only support that I cite there in 51.

1 Q Zhang does not otherwise define n ; correct?

2 A I don't recall any other place that it does,
3 although I think that definition is sufficient.

4 Q You would agree that Zhang does not provide
5 any reason for demultiplexing more channels than it
6 outputs to demodulators; correct?

7 A For demultiplexing more channels than it
8 outputs to the demodulators?

9 Q Uh-huh.

10 A In general, Zhang demultiplexes far more
11 channels than it outputs to the demodulators. That's
12 made clear in the European patent application. The
13 whole idea is that it only outputs -- that coming out
14 of -- with respect to Figure 2 -- let's go back to
15 Figure 2 of Zhang because that's what's going to drive
16 this discussion. n channels come out of digital
17 channel demux 230. m channels are output to
18 demodulators. The purpose of the n by m selector, as
19 explained clearly in the office action that explains
20 the Zhang patent, is to reduce power consumption
21 because now you only need m demodulators. You don't
22 need n demodulators. And so the most sensible and
23 clearly obvious way to read Zhang based on not only
24 common sense, but also their own expressed disclosure
25 in the prosecution history, is that m is much less than

1 n. If m was equal to n, for example, the selector
2 would not even need to exist. So, clearly, m is less
3 than n, and in fact, I would say based on the
4 disclosure in the prosecution history, m is much less
5 than n.

6 Q Okay. And so I understand those are your
7 opinions in your declaration; correct?

8 A Yes, as informed by the prosecution history,
9 among other things. Yes.

10 Q And my question was does Zhang provide any
11 reason that C1 through Cn would have to be larger than
12 D1 through Dm?

13 A I'm sorry. By Zhang, are you including the
14 prosecution history, or are you referring to the Zhang
15 reference itself?

16 Q I'm referring to the Zhang reference itself.
17 Does the Zhang -- so my question is does the Zhang
18 reference provide a reason that C1 through Cn should be
19 greater than D1 through Dm?

20 A Yes.

21 Q What is that reason?

22 A The existence of the n by m selector. So the
23 selector -- the selector -- the person of ordinary
24 skill would understand that the selector is there
25 because it's outputting fewer -- it's outputting fewer

1 channels to the demodulator -- to the demodulators --
2 sorry -- and plural, the demodulators. And so this
3 architecture, a person of ordinary skill picking up
4 Figure 2 of Zhang would go "Aha, there must be" --
5 "There's this selector there. So it's got to be, like,
6 reducing the amount of work that it needs to do. So
7 'm' has got to be less than 'n.'" And the examples in
8 Zhang support that, of course.

9 Q So the --

10 A In the examples in Zhang, m is always less
11 than n.

12 Q So the existence of the selector is the reason
13 for concluding that C1 through Cn must be lower than D1
14 to Dm; is that right?

15 A The existence of the selector discloses to a
16 person of ordinary skill that n is greater than m, yes.

17 Q Let's turn to Figure 6 of Zhang. Figure 6
18 shows that the multichannel analog RF signal of the
19 input is between 540 and 750 megahertz; correct?

20 A Yes.

21 Q This means that the bandwidth input signal is
22 210 megahertz; correct?

23 A Correct. The bandwidth input signal is 210
24 megahertz; correct.

25 Q And in the Figure 6 example, Zhang splits this

1 210 megahertz into two signals and down-converts each
2 of them to a range of 20 to 130 megahertz; correct?

3 A Correct.

4 Q Splitting the signal up into these two signals
5 allows Zhang to use a 300-megahertz ADC for each
6 signal; correct?

7 A Correct.

8 Q And each of the 300-megahertz ADCs is capable
9 of processing a signal with a frequency up to 150
10 megahertz; correct?

11 A Correct.

12 Q Each of Zhang's ADCs is more than capable of
13 processing the signals having the 20 to 130 megahertz
14 bandwidth; correct?

15 A Correct. But, of course, that 20 to 130
16 megahertz -- yes, correct.

17 Q So, for example, each of Zhang's ADCs is
18 capable of processing a signal in the range of 10 to
19 140 megahertz; correct?

20 A Potentially, yes. Now, that's not what's
21 being put into it on the RF input, but -- and so Zhang
22 has a design margin; but the input is 210 megahertz,
23 and the ADCs are each capable of handling 150
24 megahertz.

25 Q So the two ADCs in Zhang's Figure 6 are

1 capable of handling a wider bandwidth than what's shown
2 in the signal RF bandwidth; correct?

3 A The way I would put it is Figure 6 is designed
4 with margin, and, therefore, the ADCs are capable of
5 doing slightly more than the RF input being implied.
6 But the clear intention here is to produce 35 channels.
7 That's expressly disclosed. There is the output of
8 block 630, and so the 210-megahertz input is being
9 demultiplexed into 35 individual channels.

10 Q Okay. Could we go to paragraph 41 of Zhang.
11 In paragraph 41, Zhang described the frequency range of
12 540 to 750 megahertz for the input signal; correct?

13 A Correct.

14 Q In the line immediately after that, Zhang
15 states that "In other embodiments, the signal can be
16 outside this range"; correct?

17 A Right. So, in other embodiments, they can be
18 designed for different ranges of frequencies.

19 Q So a signal with a range of 510 to 780
20 megahertz would be one example of a signal that is
21 outside the range of 540 to 750 megahertz; correct?

22 A I think the way I would read it is a signal of
23 600 to 810 would be outside of the range. It's just
24 simply saying that there are other embodiments that are
25 possible.

1 Q So do you disagree that 540 -- I'm sorry.

2 Strike that.

3 Do you disagree that 510 to 780 would be
4 outside the range of 540 to 750?

5 A I just think, at that point, you are
6 speculating. I mean, Zhang doesn't say -- there's a
7 harmony to the disclosure here; right? It's 210
8 megahertz of bandwidth and 35 channels. So the example
9 is consistent that you've got a contiguous chunk of 35
10 television channels spanning 210 megahertz, and that's
11 the only conclusion that we draw from Zhang. Anything
12 else is speculation not found in Zhang.

13 And so the reference to outside the range
14 could simply mean that the tuning range is different.
15 It doesn't say that the bandwidth is higher. It just
16 says that the signal can be outside this range.

17 Q You gave an example of 600 to 810 as being
18 outside the range; correct?

19 A I'm giving that as an example to what the
20 following sentence might mean; but I want to make clear
21 that everything that I'm talking about is with
22 reference to this specific example because this
23 specific example is the only one found in Zhang, and
24 any other example is speculation not found in Zhang.

25 Q Would the range of 600 to 810 megahertz on the

1 RF input signal work in the Figure 6 example?

2 A I haven't considered that. I'm just looking
3 at the Figure 6 example.

4 Q The Figure 6 example has two 300-megahertz
5 ADCs; correct?

6 A Yes. I haven't speculated as to what else it
7 might do.

8 Q Those two 300-megahertz ADCs would be able to
9 cover the bandwidth of 600 to 810 megahertz that you
10 described; correct?

11 A They might. I don't know. I haven't -- don't
12 have an opinion on that.

13 Q Well, 600 to 810 megahertz, that's a
14 210-megahertz bandwidth; correct?

15 A It is.

16 Q And --

17 A But, to be clear, I threw out that number as
18 an example, 210 megahertz; but I want to make clear
19 that the opinions that I've expressed and I'm talking
20 about today are in connection with this one specific
21 example in Zhang, 540 to 750. I have not expressed an
22 opinion about anything else.

23 Q So you have no opinion as to whether Zhang's
24 Figure 6 embodiment would work with your example, 600
25 to 810 megahertz range; correct?

1 A I have not expressed an opinion on that.

2 Q And you can't provide an opinion on that?

3 A No.

4 Q What details would you need to be able to
5 provide an opinion?

6 A More disclosure in Zhang. I mean, all Zhang
7 talks about is this one example, and so everything else
8 is just speculation.

9 Q You understand how Zhang would work for the
10 540 to 750 megahertz example; is that right?

11 A Yes.

12 Q But you don't understand how Zhang's Figure 6
13 embodiment would work if it was an RF input signal of
14 600 to 810 megahertz; is that right?

15 A That is not what I said.

16 Q You are not willing to opine on how Zhang's
17 Figure 6 embodiment will work with an RF signal of 600
18 to 810 megahertz?

19 A I am unable to, as I'm sitting in this
20 deposition, come up on the fly or to speculate as to
21 how that might work. It would require a steady review
22 and analysis.

23 Q Let's turn to Figure 2 of the '275 patent.

24 A Okay.

25 Q The patent.

1 A Oh, Figure 2 of the '275 patent.

2 Q Yeah. They are both Figure 2.

3 A Wrong Figure 2.

4 Q Keep your Zhang handy because we will be
5 flipping through these.

6 A Okay. I am now looking at Figure 2 of the
7 '275 patent.

8 Q Okay. Referring to Figure 2 of the '275
9 patent, there's a complex mixer 250; correct?

10 A Yes.

11 Q And there's a low-pass filter 260; correct?

12 A Yeah. Specifically 260a through 260n, yes.
13 So it's actually a bank of low-pass filters.

14 Q Each complex mixer 250 receives a frequency
15 signal from a programmable oscillator to shift the
16 digitized signal so that the desired frequency is at a
17 baseband, and then a low-pass filter 260 removes the
18 remaining parts of the signal to extract the desired
19 channel; is that correct?

20 A Let's see. The outputs of the digital front
21 end in the '275 patent are output to demodulators. So
22 those are desired channels. So, yes, the low-pass
23 filter is there as part of the signal chain that
24 outputs one desired channel.

25 Q Okay. And we agree to refer to the

1 combination of one complex mixer 250 and one low-pass
2 filter as a mixer-filter chain; right?

3 A Yes.

4 Q The '275 patent discloses that the number N
5 mixer-filter chain is equal to the number of desired
6 channels; correct?

7 A In the '275 patent, yes. The number N is the
8 number of desired channels.

9 Q So let's turn to Figure 3 of Zhang. Zhang
10 discloses a complex multiplier and a low-pass filter
11 for extracting a channel from the digital channel;
12 correct?

13 A Correct. For example, 320(1), 310(1), and
14 330(1) are an example of that, yes.

15 Q And that example would extract one channel C1;
16 correct?

17 A Correct.

18 Q And a POSITA would understand that a complex
19 multiplier is a complex mixer; correct?

20 A Yes. It depends on whether it's digital or
21 analog, but yes.

22 Q Zhang also discloses that the complex
23 multiplier received a frequency signal from a
24 numerically controlled oscillator; correct?

25 A Correct.

1 Q Can we agree to refer to this combination of
2 the complex multiplier 320 and one corresponding
3 low-pass filter 330 as a multiplier-filter chain?

4 A Yes.

5 Q So, in your opinion, the number of
6 multiplier-filter chains in Zhang is different from the
7 number of mixer-filter chains in the '275 patent;
8 correct?

9 A Correct. The Zhang reference expressly
10 discloses it is the number of channels in the band, and
11 the '275 expressly discloses this number of desired
12 channels.

13 Q You do not dispute that the one
14 multiplier-filter chain in Zhang operates in the same
15 way as the one mixer-filter chain in the '275 patent;
16 correct?

17 A Well, it does in the sense that, in Zhang,
18 it's not producing a desired channel. So, in that
19 sense, that chain does not read against the claim
20 language. So there is a distinction to be made.

21 Q That distinction, in your mind, has to do with
22 whether it reads on the claim.

23 My question was whether the one
24 multiplier-filter chain in Zhang operates the same way
25 as one mixer-filter chain in the '275 patent.

1 A Yes. The mixer -- the mixer-filter chain in
2 the '275 patent operates on a desired channel, and the
3 mixer-filter chain in Figure 3 of Zhang operates on
4 some channel in the band. So the operations are
5 different in that sense.

6 Q But both operations operate to select a single
7 channel; correct?

8 MR. HENDIFAR: Object to the form.

9 THE WITNESS: They operate to select the
10 channel. In one case, it's a desired channel. In
11 another case, it is not.

12 BY MR. KRONENTHAL:

13 Q Okay. But they do that operation in the same
14 way; correct?

15 A Yes. The manner by which the '275 patent
16 chain obtains a desired channel is the same as the
17 manner in which the Zhang reference obtains a channel.

18 Q You would agree that one multiplier-filter
19 chain in Zhang picks out a channel in the same way as
20 one mixer-filter chain in the '275 patent; correct?

21 MR. HENDIFAR: Objection to form.

22 THE WITNESS: The mixer-filter chain disclosed
23 in Zhang picks out a channel in the same way that the
24 mixer-filter chain in the '275 patent picks out a
25 desired channel. Yes.

1 BY MR. KRONENTHAL:

2 Q Let's turn to paragraph 6 of Zhang.

3 Paragraph 6 of Zhang discusses Figure 1 of Zhang;
4 correct?

5 A Yes.

6 Q And Zhang discloses that Figure 1 is a
7 prior-art example; correct?

8 A Yes.

9 Q Specifically, Zhang discloses that Figure 1 is
10 a "simplified high-level block diagram of a traditional
11 multi-channel cable and satellite demodulator 100 of a
12 type that is used in cable and satellite systems";
13 correct?

14 A Correct.

15 Q Zhang then states that the "input signal
16 typically includes a plurality of RF channels, each
17 characterized by a different carrier frequency";
18 correct?

19 A Yes, that is correct. Those are the words on
20 the page, yes.

21 Q And Zhang discloses that the carrier
22 frequencies may be in the UHF band, which he identifies
23 as 300 megahertz to 3 gigahertz; correct?

24 A Yes, correct.

25 Q That would be a bandwidth of 2,700 megahertz;

1 correct?

2 A If it spanned the entire band, yes. I'm not
3 aware of a system that does, but yes.

4 Q An RF channel for a television in
5 North America is typically 6 megahertz; correct?

6 A Yes, that's correct.

7 Q So for a bandwidth of 2,700 megahertz over a
8 hundred RF channels would be possible; correct?

9 A Sure. And I'm aware of no system that
10 operates that way; but, yes, it would be 2,700 divided
11 by 6, which would be a very high number of channels --

12 Q Overall?

13 A -- if it was using that entire band. Now, I
14 don't think Zhang is saying that; but if you use the
15 entire UHF band, yes, there would be a lot of RF --
16 6-megahertz RF channels.

17 Q Okay. And let's turn to paragraph 7 of Zhang.

18 A Okay.

19 Q This is still also within the background of
20 Zhang.

21 A Right.

22 Q In paragraph 7, Zhang describes "The function
23 of each tuner 110 in Figure 1 is to select an RF
24 channel...."

25 Do you see that?

1 A Yes.

2 Q In the second line of paragraph 7, Zhang says
3 "There is one tuner for each RF channel"; correct?

4 A Correct.

5 Q Let's turn to paragraph 8 of Zhang. In the
6 first line of paragraph 8, Zhang again states that
7 "Each RF channel requires one tuner"; correct?

8 A Yes. And they are talking about each selected
9 RF channel; but, yes, each RF channel requires one
10 analog tuner.

11 Q And in the second line of paragraph 8, Zhang
12 then states that "The problem with this approach is
13 that the cost, power consumption, and complexity go up
14 as the required number of RF channels goes up";
15 correct?

16 A That's correct.

17 Q So a POSITA would understand that Zhang is
18 criticizing the use of a separate tuner for selecting
19 each RF channel when there are a large number of RF
20 channels; correct?

21 A Right. And to be clear, it's talking about a
22 tuner as shown in Figure 1. Yes.

23 Q A POSITA would have understood from Zhang that
24 it is not desirable to have over a hundred tuners to
25 select each RF channel; correct?

1 A If, by "tuner," you mean the tuners of
2 Figure 1, that is correct.

3 Q And, likewise, a POSITA would have understood
4 that it is not desirable to have over 100
5 multiplier-filter chains in a television receiver;
6 correct?

7 MR. HENDIFAR: Objection to form and scope.

8 THE WITNESS: I don't know. I mean, Zhang has
9 35 of them in this one example, and I don't know -- I
10 don't see where Zhang -- other than their example of
11 35, I don't see where Zhang opines on what number above
12 35 would be unreasonable.

13 BY MR. KRONENTHAL:

14 Q And I was asking about whether you think a
15 POSITA would have found over 100 multiplier-filter
16 chains to be reasonable.

17 MR. HENDIFAR: Object to the form and scope.

18 THE WITNESS: I don't -- I have not expressed
19 an opinion on that.

20 BY MR. KRONENTHAL:

21 Q Do you have an opinion now?

22 A Not as I sit here, no.

23 Q So you have no opinion as to whether a person
24 of ordinary skill in the art would have found having
25 over 100 multiplier chains in a television receiver to

1 be reasonable?

2 MR. HENDIFAR: Objection to form and scope.

3 THE WITNESS: I have not expressed an opinion
4 on that.

5 MR. HENDIFAR: Whenever is it a good time for
6 a break?

7 MR. KRONENTHAL: Okay. Let's take a break
8 now.

9 (Off the record.)

10 BY MR. KRONENTHAL:

11 Q Right before the break, we were talking about
12 Zhang's multiplier-filter chains.

13 A Correct.

14 Q A POSITA would have understood that having a
15 number of multiplier-filter circuits less than all RF
16 channels in the input signal would lower cost; correct?

17 MR. HENDIFAR: Objection. Form.

18 THE WITNESS: Well, it might, but we are
19 also -- I mean, Zhang clearly expresses why it has so
20 many filter chains. They make the point that by
21 bringing out every television channel, C1 through Cn,
22 where in the example n is 35, channel change is
23 actually a lot faster because all of the channels are
24 always available. So there are other considerations
25 besides cost that drive the design of these appliances.

1 BY MR. KRONENTHAL:

2 Q But you would agree that reducing the number
3 of multiplier-filter circuits reduces cost; correct?

4 A Well, the most complete answer is not
5 necessarily. It depends on the chip fabrication
6 techniques that are being employed to make the circuit.

7 Q So, in your view, fewer multiplier-filter
8 circuits could have the same cost as a greater number
9 of multiplier-filter circuits?

10 A Well, under certain circumstances, yes.

11 Q What circumstances?

12 A For example, if all 35 filter --
13 multiplier-filter chains fit on a single chip, having a
14 smaller number of them is probably not going to make
15 the chip any less expensive. Chips are -- the cost of
16 a chip is mainly constrained to the physical size of
17 the chip and expresses an area, and the area of the
18 chip is constrained by the number of input/output
19 paths. So it's not necessarily true that reducing the
20 number saves cost.

21 Q Reducing the number of multiplier-filter
22 circuits could reduce the size of the chip; correct?

23 A That's not necessarily true. If the pad ring
24 is the same size, it would not reduce the size of the
25 chip.

1 Q I'm sorry. You said if the pad ring --

2 A If the pad ring -- if the number of inputs and
3 outputs to the chip does not change, the chip is going
4 to be of a certain size, and taking the Logi gauge off
5 of the chip is not necessarily going to make the chip
6 smaller.

7 That's my point. That's kind of the irony of
8 consumer electronics. While it may be true that adding
9 circuitry makes something more expensive, it is not
10 true -- and even that's more debatable -- is not always
11 the case that taking circuitry out lowers the cost.

12 Q You would agree that --

13 A And, again, Zhang was clearly expressly
14 designed with rapid channel change in mind. So there's
15 other considerations that Zhang brings to the table
16 beyond cost.

17 Q But you would agree that cost is one
18 consideration; correct?

19 A Cost is one. Performance is another.

20 Q And a person of ordinary skill in the art
21 reading Zhang would consider cost when building Zhang's
22 system; correct?

23 A Cost and performance. And I can tell you that
24 in the television arts, channel-change time is of
25 paramount importance. So that really resonated with me

1 when I read Zhang. I understood "Okay. That's why
2 they are doing it. That makes sense to me."

3 Q And that is the purpose of the selector in
4 Zhang; correct?

5 A Well, the purpose is the fact that you have
6 fewer demodulators than you have channels coming out,
7 and so -- right -- the selector is there to route so
8 that each demodulator gets a channel. And because that
9 selector -- because the selector is in the digital
10 domain and because the signal chains in Figure 3 don't
11 ever have to change their frequencies, channel change
12 is very rapid.

13 Q Let's turn to paragraph 39 of Zhang. Do you
14 see where Zhang explains that "Because a bus clock is
15 much faster than the channel-sampling rate, each bus
16 can be used by multiple RF channels with the use of
17 time division multiplexing, which occurs before the
18 selected RF channels enter the data buses. Hence, each
19 data bus provides data to multiple demodulators and
20 each out RF signal from a channel multiplexer (not
21 shown) can be selected to use any data bus"?

22 A Okay.

23 Q Do you see that?

24 A I see that.

25 Q You would agree that a bus clock would be

1 faster than the sampling channel rate; right?

2 A I mean, I agree that's what Zhang discloses.
3 I don't think you can say that in general; but in here,
4 Zhang, the bus block that we are talking about is much
5 faster than the channel sampling rate.

6 Q You would agree that multiple RF channels can
7 be time-division multiplexed by the selector onto a
8 data bus for delivering multiple channels to a
9 demodulator at once; right?

10 A That is what Zhang discloses. Yes.

11 Q And you would agree that by delivering
12 multiple channels to a demodulator at once, the bus
13 selector makes it possible to deliver television
14 channels to a user or subscriber faster when a
15 subscriber flips between channels; correct?

16 A No. That's not the purpose of the high speed.
17 The purpose of the high speed is just there so that one
18 bus can carry more than one channel. That's a
19 completely different purpose. What makes the rapid
20 channel change possible is the fact that all 35
21 channels are in multiplex, and so you don't wait on the
22 NCO to change value. Every channel is instantly
23 accessible because the system of Zhang is
24 demultiplexing all channels.

25 Q Zhang's selector 240 can switch to different

1 data buses faster than you can change the frequency on
2 an NCO; correct?

3 A I'm sorry. What? I'm sorry. I don't
4 understand your question.

5 Q Okay.

6 A The -- maybe we should look at a figure of
7 Zhang to -- Figure 5 is --

8 Q I think Figure 2 would be the best.

9 A Okay. Well, I think we need to look at
10 Figure 5 and Figure 2, but that's fine. What -- please
11 repeat your question.

12 Q So my question is -- well, let's break it up a
13 little bit because it was -- let's look at Figure 3,
14 actually, because that shows the NCO for the
15 multiplier --

16 A Okay.

17 Q -- in Zhang.

18 A Uh-huh. Sure.

19 Q The NCO sets a target frequency for that
20 complex multiplier to shift the frequency down so that
21 the low-pass filter can select the frequency -- the
22 channel; correct?

23 A Right. So the NCO for C2 is going to have a
24 setting that brings that channel out. Yes.

25 Q And so let's just focus on the first NCO(1) --

1 310(1). Do you see that at the top?

2 A Sure, I see that.

3 Q And that provides the target frequency for
4 complex multiplier 320(1); correct?

5 A Correct.

6 Q Changing that target frequency -- you would
7 agree that Zhang could change that target frequency;
8 correct?

9 A I don't agree with that.

10 Q Do you agree that it's -- the NCO is a
11 programmable device that allows for changing a target
12 frequency; correct?

13 A It can be, but Zhang has a very specific
14 implementation. So, in this example, it brings in
15 210 megahertz and slices it into 35 RF channels. As
16 long as the cable operator is using 540 to 750
17 megahertz for those 35 channels, which is going to be
18 for, like, a decade, the system of Zhang does not need
19 to change the NCO settings.

20 It is a fixed function. It is a fixed
21 function because it's expressly designed to output all
22 channels, and so it's going to -- that NCO is going to
23 have one value for a really, really long time. In
24 fact, this is really possible for the life of the
25 product that the NCO value will never change.

1 Q And you are referring to the Figure 6 example
2 with the 35 channels; is that right?

3 A Well, I'm not referring to just the Figure 6
4 example. I'm referring to the entire underlying
5 philosophy of Zhang. Zhang is expressly bringing out
6 all channels so that it can rapidly channel-change. It
7 doesn't have to wait on the NCO to change and the
8 settling time that occurs. It programs each NCO with a
9 fixed number. It brings out all channels, and that's
10 how it accomplishes rapid channel change.

11 So the disclosure of rapid channel change
12 makes clear to a POSITA that figure -- the system in
13 Figure 3 is essentially a fixed function device. An
14 example of the fixed function is the paragraph 41 and
15 paragraph 42 example; but it is expressly designed to
16 bring out all of the channels so that it can rapidly
17 channel change between them.

18 Q Okay. Thank you. And you said that it takes
19 time for the NCOs to settle to new frequencies;
20 correct?

21 A Yeah. It takes -- if you are -- the added
22 time to reprogram the NCO and to have, like, the new
23 information pass directly through the mixer, it adds
24 latency.

25 Q And that's -- each NCO has that latency

1 correct?

2 A It would. Each NCO would. It's intrinsic to
3 the nature of the NCO and the mixer. Yes.

4 Q That the frequencies need time to settle
5 before you can actually output the channel to the
6 demodulators; correct?

7 A Well, before the output of the channel --
8 right -- is not some garbled thing; right? For it to
9 be correct, there's latency, and, you know -- yes.

10 Q And the latency you are talking about is the
11 time it takes to allow those frequencies to settle so
12 that you can demodulate that channel; correct?

13 A Well, in the case of '275, yes. Of course, in
14 the case of Zhang, not every channel is being passed
15 through a demodulator. But the way I would put it is
16 if Demodulator 3 wants to switch from Channel 4 to
17 Channel 8, if it had to reprogram the NCO to do that,
18 it would take longer.

19 So, instead, what they do in Zhang is they
20 bring out all of the channels, and the selector routes
21 the constantly streaming Channel 8 to the demodulator
22 instead of the constantly streaming Channel 4. And
23 that's how Zhang inventively eliminates that latency.
24 That's how Zhang inventively reduces channel-change
25 time by expressly bringing out all channels.

1 Q And you agree that it's the selector 240 that
2 provides that fast channel-switching; correct?

3 A Well, it's a combination of selector 240 and
4 the fact that the input to the selector is all
5 available channels. So, really, it's the architecture
6 that is providing the fast channel change.

7 Q You would agree that Zhang's selector 240 has
8 two different functions: one to provide fast
9 channel-changing and, two, to reduce the number of
10 channels that are output to demodulators; right?

11 A The function of the selector is to reduce the
12 number of channels that go out to the demodulator, and
13 because the channel demux 230 outputs all channels, the
14 selector is able to accomplish rapid channel change
15 because the NCOs and the demux do not need to be
16 reprogrammed every time a channel is changed. So the
17 rapid channel change is really a function of a
18 combination of 230 and 240.

19 Q Different subscribers would desire to watch
20 different television channels; correct?

21 A If, by "desired," you mean as described in the
22 '275 patent, yes.

23 Q A POSITA would have known that different
24 subscribers would be subscribed to different television
25 channels; correct?

1 MR. HENDIFAR: Objection. Form.

2 THE WITNESS: The way I would put it is the
3 digital box is designed so that a subscriber could
4 potentially subscribe to every single channel that the
5 cable operator offered. The box -- the box is designed
6 to access all possible content.

7 BY MR. KRONENTHAL:

8 Q And different subscribers could have different
9 subscriptions that would control how much or how little
10 of that content they could access; correct?

11 A Right. Also noting that the subscriber
12 subscriptions can change over time. Yes.

13 Q So, for example, a POSITA would have known
14 that one subscriber might be subscribed to HBO while
15 another subscriber is not subscribed to HBO?

16 A That is correct.

17 Q And a POSITA would have wanted to build
18 Zhang's receiver to work for both subscribers
19 regardless of their subscriptions; correct?

20 A Right. Correct. So that's why Zhang outputs
21 to all channels. It's ready for anything.

22 Q To build a receiver, according to Zhang, so
23 that it is operable for different subscribers with
24 different subscriptions, a POSITA would have chosen a
25 set number of multiplier-filter chains to be included;

1 correct?

2 A Well, I think it's pretty clear that Zhang is
3 expressly designed to just bring out all channels
4 because the expressed goal of Zhang is to reduce
5 channel-change time. And, in fact, that's the
6 advantage of Zhang over previous -- or an advantage of
7 Zhang over earlier art, and so it accomplishes what it
8 accomplishes by, in between 230 and 240, bringing out
9 all channels.

10 Q A POSITA would have understood that Zhang
11 would not have wanted to demultiplex channels that a
12 user is not even subscribed to; correct?

13 MR. HENDIFAR: Object to the form.

14 THE WITNESS: I mean, that's just not in Zhang
15 at all. That is not in Zhang. The whole goal in Zhang
16 was to bring out all channels. And further
17 complicating it, Channel 2, for example, might include
18 HBO and the Golf Channel, and maybe the Golf Channel
19 does not require a special subscription. So it's not
20 the case that every C either contains exclusively
21 subscribed content or not. It's finer-grained than
22 that. So that's the first problem, and the second
23 problem is it's just more likely Zhang was not designed
24 for that. Zhang is designed to take, for example, 210
25 megahertz and slice it out into 35 channels.

1 BY MR. KRONENTHAL:

2 Q You agree that television providers would have
3 wanted the flexibility to increase the number of
4 television channels available for selection by users;
5 correct?

6 MR. HENDIFAR: Object to the form.

7 THE WITNESS: I do not agree with that.

8 BY MR. KRONENTHAL:

9 Q So it's your opinion that television providers
10 were not interested in increasing the number of
11 available television channels in the earlier 2000s?

12 MR. HENDIFAR: Object to the form.

13 THE WITNESS: Cable operators were and are
14 today trading off their plant between the needs for
15 data and the need for television, and so often more
16 channels made the data-offering like cable modem speeds
17 slower. That would be -- that might be undesirable.
18 So it's not automatically the case that operators are
19 trying to add more broadcast channels to their plan.

20 BY MR. KRONENTHAL:

21 Q You would agree that in some situations a
22 cable television provider would have wanted to increase
23 the number of television channels available, though.
24 No?

25 A Again, in a world where cable providers, even

1 by 2000, were providing data services, that's just
2 not -- I guess my answer is it's much more complicated
3 than that.

4 Q Television providers would have wanted a
5 set-top box that is flexible to deal with the different
6 number of possible television channels; correct?

7 MR. HENDIFAR: Objection to form.

8 THE WITNESS: I don't know. I mean, the nice
9 thing about the system in Zhang is that it teaches that
10 by packing all of the broadcast channels together, you
11 can actually reduce the cost of the analog-digital
12 converter, for example. So Zhang again is designed for
13 this world where it's just -- it brings out the 35
14 channels that come in, and it's clearly designed that
15 way.

16 BY MR. KRONENTHAL:

17 Q Is it your view that Zhang discloses an input
18 signal that -- where the channels are all packed
19 together?

20 A Yes.

21 Q 35 6-megahertz channels?

22 A Absolutely.

23 Q Is it your view that that's the only -- strike
24 that.

25 Is it your view that Zhang does not disclose

1 noncontiguous channels at the RF input signal?

2 A By -- I'm sorry. What do you mean by
3 "noncontiguous"?

4 Q Earlier in the deposition, we discussed the
5 noncontiguous channels in the '275 patent; correct?

6 A Yes. In the '275 patent, they are
7 noncontiguous, but they all lie inside the same
8 80-megahertz frequency band. And so all of the
9 channels -- there's ten channels in 80 megahertz.
10 Those ten channels are contiguous inside that band.
11 The entire channels are not contiguous because only
12 certain channels are desired.

13 Q Is it your view that Zhang could not input the
14 same RF input that the '275 patent inputs in Figure 2?

15 A The -- I mean, the only difference between the
16 example in Figure 2 of the '275 and the example in
17 Zhang is that Figure 2 has ten 8-megahertz channels and
18 Zhang has 35 6-megahertz channels; but those -- inside
19 those bands, the 80-megahertz bands in the '275 and the
20 210-megahertz bands in Zhang, the channels are
21 contiguous.

22 Q Again, when you are talking about the 35
23 channels, you are talking about the Figure 6 example;
24 correct?

25 A Yeah. I'm talking about the only example in

1 Zhang in paragraph 41 and 42.

2 Q In Figure 2 of Zhang, it doesn't provide a
3 specific bandwidth for the RF input; correct?

4 A Correct. But it does not address the issue of
5 bands that are separate or one band and then nothing
6 and then another band. That is -- Zhang is completely
7 silent with respect to that scenario.

8 Q So, in your view, Zhang is completely silent
9 in respect to the scenario of the RF input signal to
10 Figure 2 having noncontiguous bands?

11 A It is silent that every example in Zhang is
12 drawn to a chunk of bandwidth containing contiguous
13 television channels, and so it's improper to say -- to
14 rely on Zhang for a teaching of anything other than
15 that.

16 Q When you say "every example," are you
17 referring to the Figure 6 example?

18 A Yes.

19 Q Can you point to any other example?

20 A No.

21 Q A cable provider would not have wanted to give
22 the subscriber a new set-top box each time it adds
23 television channels; correct?

24 MR. HENDIFAR: Object to the form.

25 THE WITNESS: It depends on how they add the

1 new channels. I mean, I know that, like, the -- it
2 depends on how they add the channels.

3 BY MR. KRONENTHAL:

4 Q They could add the channels by adding a new RF
5 channel; correct?

6 A They could.

7 Q In your view, if they added a new RF channel,
8 they would have to add a new multiplier-filter chain in
9 Zhang; is that right?

10 A I haven't speculated on what happens when a
11 channel -- when the cable plan changes. I mean,
12 Zhang's only example is a very specific range of
13 frequencies.

14 Q Are you able to give me an opinion right now?

15 A No.

16 Q Why not?

17 A It would require careful study and analysis,
18 and I would -- it would require careful study and
19 analysis, and I would have to be careful not to read
20 into Zhang something that's just not there.

21 Q If the cable provider added television
22 channels by increasing the RF channels, Zhang's
23 Figure 2 embodiment would still work; correct?

24 MR. HENDIFAR: Objection to form.

25 THE WITNESS: There's no way to answer that

1 question. It depends exclusively on how the cable
2 operator adds the channels and the limitations of the
3 disclosure in Zhang.

4 BY MR. KRONENTHAL:

5 Q So, in my question, I explained that the cable
6 operator was adding the channels by increasing the RF
7 channels. Strike that.

8 The NCOs in Zhang's demultiplexer would allow
9 it to target new channels added by a cable provider;
10 correct?

11 MR. HENDIFAR: Object to the form.

12 THE WITNESS: I don't know. There's not
13 enough information in Zhang for me to answer that
14 question.

15 BY MR. KRONENTHAL:

16 Q A person of ordinary skill in the art would
17 have understood that the NCOs allow Zhang's
18 demultiplexer to target new channels added by the cable
19 provider; correct?

20 A No, that's not correct. There's way more to
21 it than just that.

22 Q So a person of ordinary skill in the art would
23 not understand that?

24 A A person of ordinary skill would not be able
25 to answer your question because of the limited

1 disclosure of Zhang.

2 Q A person of ordinary skill in the art would
3 understand that NCOs could be reprogrammed; correct?

4 A They would. They could. Yes, they could
5 understand that. Of course, that defeats the entire
6 purpose of the rapid channel change in the express case
7 of Zhang, but yes.

8 Q Please turn to Claim 2 of Zhang. The first
9 limitation in Claim 2 recites: "A selector configured
10 to receive the separate digital RF channels and to
11 select one or more separate digital RF channels."

12 Do you see that?

13 A I do.

14 Q Selecting one or more of the separate digital
15 RF channels would include selecting all of the separate
16 digital RF channels; correct?

17 A Well, in the express embodiment of Zhang, no.
18 There's only 20 outputs, and there's 35 inputs. So it
19 cannot possibly do that. It's literally impossible.
20 So -- so there's an embodiment in Zhang that -- anyway,
21 continue.

22 Q My question was about Claim 2, and you are
23 referring back to the Figure 6 embodiment -- is that
24 right? -- in your answer.

25 A Yeah. Yes.

1 Q So, just looking at Claim 2, you would agree
2 that selecting one or more of the separate digital RF
3 channels would include selecting all of the separate
4 digital RF channels; correct?

5 A Well, I mean, each individual output of the
6 selector could be routed to one of all of the possible
7 RF channels; but this does not say that it's possible
8 for the selector to output all possible RF channels.
9 That is expressly not in the claim. And a POSITA
10 seeking to understand that or explore that would
11 instantly encounter the fact that in one embodiment in
12 Zhang -- I should say in the embodiment of Zhang, it
13 only outputs 20 even though it inputs 35, and so it's
14 literally impossible to output all channels.

15 Q You said the "embodiment of Zhang."

16 Is it your view that Zhang only describes one
17 embodiment?

18 A No. Zhang only has one example of n and m ,
19 and in that example, it is literally impossible for the
20 selector to output all channels at the same time, and
21 that's completely keeping with the philosophy of Zhang.
22 We were trying to reduce the amount of demodulators as
23 expressed by the European patent office action, for
24 example.

25 Q So your reading of that first limitation in

1 Claim 2 excludes the selection of all the separate
2 digital RF channels; is that right?

3 A I -- wait. Are you asking me if the scope of
4 Claim 2 of Zhang or the scope of the claims in the '275
5 patent or whether Zhang reads against the '275 patent?

6 Q Sure. I'm asking about -- we are on Claim 2
7 of Zhang.

8 A Right.

9 Q And I'm asking you the scope of that first
10 limitation, that the -- "a selector configured to
11 receive the separate digital RF channels and to select
12 one or more separate digital RF channels."

13 So the scope of that, that would include
14 selecting all of the one or more digital RF channels;
15 correct?

16 MR. HENDIFAR: Object to the scope.

17 THE WITNESS: Well, first off, it's
18 necessarily true that if the number of outputs of the
19 selector is less than the number of inputs, then the
20 selector is not possible. And this claim is silent --
21 is specifically silent on that; but in view of the
22 specification, it is clear to a POSITA that the number
23 of outputs is substantially less than the number of
24 inputs. Otherwise, the presence of the selector makes
25 no sense.

1 BY MR. KRONENTHAL:

2 Q That doesn't answer my question because my
3 question is about the scope of what it says right here
4 in Claim 2 of Zhang.

5 Does that not disclose selecting all of the
6 separate digital RF channels?

7 A Not to a POSITA for all of the reasons I just
8 explained.

9 Q And your reasoning is based upon that Figure 6
10 example of Zhang; is that correct?

11 A Well, it's actually based on the existence of
12 the selector in the first place. If the whole goal of
13 Zhang was every demodulator demodulate every channel --
14 first off, according to the European patent
15 application, the entire purpose of Zhang is to not do
16 that. And, secondly, why would the selector even exist
17 in the first place?

18 The (inaudible) selector is because there's
19 fewer demodulators than there are channels. That's
20 clear to a person of ordinary skill.

21 Q So, in your view, the limitation in Claim 2
22 that says "A selector configured to receive the
23 separate digital RF channels and to select one or more
24 separate digital RF channels" does not disclose
25 selecting all of the separate digital RF channels; is

1 that right?

2 A I believe that the claim read in light of the
3 specification does not disclose that to a person of
4 ordinary skill.

5 Q Okay. Let's turn to paragraph 28 of Zhang.
6 Do you see where Zhang -- it's paragraph 28 -- refers
7 to the n by m digital selector 240?

8 A Yes.

9 Q And the variable m cannot be more than the
10 variable n because you can't output more than you
11 input; correct?

12 A I think that's true.

13 Q Zhang does not define m; correct?

14 A Well, I think Figure 2 defines m. There's m
15 outputs and m demodulators. So m is the number of
16 demodulators. Figure 2 makes that clear.

17 Q A POSITA would have understood that the letter
18 m is a variable that is an integer from 1 to n;
19 correct?

20 A Yes.

21 Q So, if n equals 10, m denotes any integer from
22 1 to 10; correct?

23 A I have a two-part answer to that. Correct,
24 except the entire -- if n was even close to m, there
25 just would be no need for the selector. You would just

1 throw in the towel and use the -- give in the selector
2 and use the extra dates to make the number of
3 demodulators to match the number of channels.

4 Q Does Zhang ever expressly disclose n being
5 less than m?

6 A No. It doesn't need to. The selector makes
7 it clear to a POSITA. Yeah.

8 Q By disclosing n by m selector, Zhang is
9 disclosing a variety of selectors. Do you agree?

10 MR. HENDIFAR: Objection. Form.

11 THE WITNESS: In the sense that n and m can
12 have different values, yes.

13 BY MR. KRONENTHAL:

14 Q So n's -- strike that.

15 Zhang's n by m selector would cover a 10-by-4
16 selector; right?

17 A You mean 10 inputs and 4 outputs, yes.

18 Q Zhang's n by m selector would cover a 20-by-5
19 selector; correct?

20 A If you mean by that 20 inputs and 5 outputs,
21 yes.

22 Q Okay. Let's look at Figure 2 of Zhang.
23 Figure 2 shows the demultiplexer 230 outputting
24 channels C1 through Cn; correct?

25 A Correct.

1 Q Figure 2 shows all channels C1 to Cn going to
2 the selector 240; correct?

3 A Correct.

4 Q Figure 2 shows channels D1 to Dm going out of
5 selector 240; correct?

6 A Correct. And each going to a demodulator --
7 to a different demodulator.

8 Q And now let's go to Figure 5. The circuit in
9 Figure 5 is an example of selector 240 of Figure 2;
10 correct?

11 A Correct.

12 Q In Figure 5, channels C1 through Cn are
13 illustrated entering the bus selector 510 on the left
14 side of the circuit; is that right?

15 A That's right.

16 Q And the bus selector 510 passes at least one
17 of the channels C1 to Cn through data buses C1to Ck;
18 correct?

19 A Yes. And the figure makes it clear that the
20 Data Bus 1, for example, contains at least D1 through
21 Dm. Yes.

22 Q So the bus selector 510 may choose to pass
23 multiple channels from C1to Cn on Data Bus 1 serially;
24 correct?

25 A Yes, in this case D1 through Dm.

1 Q Or the bus selector 510 may choose to pass
2 some of channels C1 to Cn on Data Bus 1 and some other
3 channels of Channels C1 to Cn on Data Bus 2; correct?

4 A That's not shown on Figure 5, and it's clear
5 from Figure 2 that you have 1 through n going in and 1
6 through m going out.

7 Q The bus selector 510 may choose to pass C1 on
8 Data Bus 1 and C2 on Data Bus 2; correct?

9 A I -- that's not clear from Figure 5. What's
10 clear from Figure 5 read in light of Figure 2, and keep
11 in mind that Figure 5 is an implementation of the
12 selector in Figure 2, is that D1 through Dm are a subset
13 of the channels being passed into it. As drawn in
14 Figure 5, every data bus contains the same information.

15 Q You would agree that the bus selector 510 does
16 not modify the channels C1 to Cn when it puts it on the
17 data buses; correct?

18 A There's no evidence that it does.

19 Q And the time division demultiplexer on the
20 right-hand side does not modify the data of the channel
21 it receives; correct?

22 A I would assume that it does not, and so it
23 demultiplexed D1 through Dm in this example, Figure 5.

24 Q A POSITA would have understood that there is
25 some logic or control for controlling the bus selector

1 510 even though it's not shown here; correct?

2 A I think that's correct, yes.

3 Q And that logic or controller would control
4 which data buses are used to pass the channels C1 to Cn;
5 correct?

6 A You mean Figure 5?

7 Q Yes.

8 A Well, I don't know because, in Figure 5, all
9 data buses contain the same data.

10 Q There would be some logic controller to make
11 that logic; correct?

12 A I don't know. Figure 5 is unclear.

13 Q Please turn to paragraph 50 of your
14 declaration. Are you there?

15 A Yes.

16 Q In the first line, you state that Zhang and
17 its prosecution history confirm that channels C1 to Cn
18 are all the channels in the entire signal band that are
19 indiscriminately demultiplexed without any
20 discrimination"; correct?

21 A Correct.

22 Q And this challenges Zhang's C1to Cn; right?

23 A I don't want to limit myself; but in that
24 section, yes, that's the opinion that I expressed.

25 Q And the way this first sentence is written, it

1 indicates that the channels are demultiplexed, but you
2 meant that the signal band would be demultiplexed to
3 get the channels; right?

4 A I don't understand the distinction. C1 through
5 Cn are channels in the entire signal band, and they've
6 been demultiplexed out into their separate C1, C2, C3,
7 et cetera.

8 Q Yes. All right. Let's turn to Claim 1 of the
9 '275 patent. If you could, read the "selecting" step.

10 A "Selecting, by a digital frontend (DFE)
11 coupled to the ADC, the plurality of desired channels
12 from the digitized signal...."

13 Q Thank you. And your opinions are based on
14 reading the selecting step such that it excludes
15 selecting undesired channels; is that correct?

16 A No. The claim simply says "selecting desired
17 channels."

18 Q You did not construe the word "selecting";
19 correct?

20 A Other than observing that it has its plain and
21 ordinary meaning, no, I did not; or maybe what I'm
22 saying is, because I did not construe it, I believe it
23 has its plain and ordinary meaning.

24 Q And you didn't cite any dictionary definition
25 for the plain and ordinary meaning of "selector";

1 correct?

2 A I don't believe I did. That's correct. I
3 believe that's correct.

4 Q Please turn to paragraph 75 of your
5 declaration.

6 A Okay.

7 Q In the second sentence, you said that "Zhang
8 does not state that channels C1 to Cn contain 'only'
9 desired channels, as the claims require."

10 Do you see that?

11 A Yes.

12 Q So is it your opinion that Claim 1 of the
13 patent requires selecting only desired channels?

14 A No. I'm saying that's what channels --
15 channels C1 to Cn? Zhang contains both desired and
16 undesired channels, but that's not -- but the claims
17 don't require not selecting undesired channels. Claims
18 1 and 2 of the '275 do not require not selecting
19 undesired channels.

20 Q Okay. You stated earlier that you did not
21 review the D1 and D2 references that were cited during
22 the AP prosecution; is that correct?

23 A I don't recall if I did. I mean, I might
24 have, but I don't recall at the moment.

25 Q Then you don't recall whether D1 or D2 include

1 a selector like Zhang selector 240, then; correct?

2 A Well, I think the whole point of the -- well,
3 let me hold on a second. Well, the office action makes
4 it clear that Zhang is distinct over the art because it
5 has a selector, and the selector allows only selected
6 channels or later demodulated unlike systems which
7 demodulate all of the RF channels. And so this passage
8 makes it clear that prior-art systems don't have a
9 selector, basically.

10 MR. KRONENTHAL: If we take a short
11 five-minute break, I might be done.

12 MR. HENDIFAR: Yes.

13 MR. KRONENTHAL: Go off the record.

14 (Off the record.)

15 BY MR. KRONENTHAL:

16 Q Dr. Russ, please turn to paragraph 57 of your
17 declaration.

18 A Okay.

19 Q In the last sentence, you said "This comports
20 with my understanding of a typical cable plant in the
21 US, such as those that the set-top box designs that I
22 managed were designed to attach to."

23 Do you see that?

24 A Yes.

25 Q You have not designed a set-top box that

1 demultiplexes all channels in the input signal from a
2 cable plant; correct?

3 A No. But I'm talking about my understanding of
4 a typical cable plant, not the set-top boxes that I
5 designed. The sentence is drawn to the typical cable
6 plant.

7 Q And you have not designed a set-top box with
8 35 multiplier-filter chains to demultiplex 35 RF
9 channels; correct?

10 A Correct. The tuners in those boxes worked in
11 a completely different way.

12 Q Do you consider the claims of Zhang to be part
13 of Zhang's disclosure?

14 A I think they are, yes.

15 Q Is it fair to say that you gave less weight to
16 Zhang's claims than to the detailed description in
17 Zhang?

18 A No.

19 Q You would agree that one of the issues in this
20 case is whether or not Zhang's demultiplexer 230
21 indiscriminately demultiplexed all channels to get C1 to
22 Cn; correct?

23 A Yeah, I think, as paragraph 50 explains,
24 Zhang, in its prosecution history, confirms that
25 channels C1 through Cn are all channels in the entire

1 signal band that are indiscriminately demultiplexed
2 without any selected. Yes, that is my opinion.

3 Q And that's one of the issues in this case is
4 whether that's true or not; correct?

5 A I suppose you could word it that way, yes.

6 Q That is the same issue as the issue in the
7 prior IPRs for the '362, '866, and '206 patents;
8 correct?

9 MR. HENDIFAR: Object to form.

10 THE WITNESS: It's one of the issues, and I'll
11 also note that, of course, the claim language is
12 different between those four -- in these four cases.

13 BY MR. KRONENTHAL:

14 Q One more question. Did you discuss this case
15 with your attorneys during any of the breaks today?

16 A Absolutely not.

17 MR. KRONENTHAL: Okay. Thank you for your
18 time, Dr. Russ.

19 THE WITNESS: Thank you.

20 MR. KRONENTHAL: I have no further questions.

21 MR. HENDIFAR: Can I have a five-minute break
22 to decide if we are going to have any or not? So, if
23 you could, give us a five-minute break, please.

24 MR. KRONENTHAL: Let's go off the record.

25 (Off the record.)

1 MR. HENDIFAR: Back on the record.

2 EXAMINATION

3 BY MR. HENDIFAR:

4 Q Dr. Russ, do you recall that counsel asked you
5 about Comcast Exhibit 1086, the colorful frequency map?

6 A Yes, right.

7 Q Will you refresh our memory about what this
8 document is.

9 A This is how the over-the-air radio spectrum
10 was used in the U.S. as of October 2003.

11 Q Okay. And do you recall when counsel was
12 asking you about Zhang getting that input from parts of
13 this frequency, pictures shown in Exhibit 1086?

14 A Yes.

15 Q Did you have time to review Zhang's
16 embodiments and think whether Zhang's embodiments can
17 be used for the inputs for the broadcast shown in
18 Exhibit 1086?

19 A I believe that the signals that are described
20 in this chart -- again the October 2003 date is
21 important -- would not work with the embodiment in
22 Zhang. So what I mean by that is, in October 2003,
23 television broadcasts were in analog format. So, for
24 example, with reference to -- it must be page 2. It
25 shows 54 megahertz to 72 megahertz. Over the air,

1 those would have been analog television channels.

2 The embodiment in Figure 2, the output of the
3 selector goes to a demodulator and FEC. Demodulator
4 and FEC are used for digital channels. If Zhang had
5 one of the embodiments in Figure 2 to accept
6 over-the-air antenna television in 2003, it would have
7 used a decoder, and there would have been no need for
8 FEC.

9 And for the record, FEC is spelled F-E-C.

10 And so the embodiments shown here in Zhang
11 would not work because they don't contain any decoders
12 that would work with analog television.

13 Q Thank you. And for a layperson like me,
14 Zhang's figures to input is still an analog signal that
15 is digitized. How is that use of the word "analog"
16 compared to when you state that television was analog
17 in 2003?

18 A Yeah. Literally, it's confusing. Over the
19 air or even over the coaxial cable, all of the signals
20 are analog. A 6-megahertz television channel in
21 North America is -- in North America over cable is
22 formatted one of two ways, either an analog format like
23 NTSC or digital format like 256-QAM.

24 Demodulator and FEC is for television that has
25 a digital format. If a television signal has analog

1 format, that is not what you would use to turn it into
2 a viewable signal.

3 Q I see. So you could still, in Figure 12,
4 Zhang, the RF signal -- when there's an analog signal,
5 the information can be coded in digital form as opposed
6 to analog form and vice versa?

7 A Right. The 6-megahertz channel contains a
8 digital data stream. You need the demodulator to
9 reconstruct that digital data stream. If the
10 6-megahertz channel contained an analog television
11 broadcast, you would need a decoder, and there would be
12 no FEC.

13 MR. HENDIFAR: I have no further questions.

14 FURTHER EXAMINATION

15 BY MR. KRONENTHAL:

16 Q Okay. I just have a few questions. Dr. Russ,
17 could you go to paragraph 23 of Zhang.

18 A Okay.

19 Q In paragraph 23 of Zhang, Zhang describes how
20 its system's frequency block down-converter 210 can
21 receive one or more multichannel analog RF signals,
22 which can be sourced from terrestrial TV systems;
23 correct?

24 A That's what it says. Now, Figure 2 does not
25 enable that; but, yes, that's what it says.

1 Q And the television broadcasting channels that
2 are in the Exhibit 1086 that we were just discussing,
3 those are the television broadcast channels that would
4 be used for terrestrial TV systems; correct?

5 A Right. Over the air, like, over an antenna.

6 MR. KRONENTHAL: I have no further questions.

7 MR. HENDIFAR: I have one more.

8 FURTHER EXAMINATION

9 BY MR. HENDIFAR:

10 Q In 2000 -- so is it correct to believe to have
11 a --

12 MR. KRONENTHAL: Objection. Sorry. You can't
13 ask questions after I do a redirect.

14 MR. HENDIFAR: I believe I can.

15 MR. KRONENTHAL: No. There's a cross- -- I'm
16 doing cross.

17 MR. HENDIFAR: Right.

18 MR. KRONENTHAL: Then you do your --

19 MR. HENDIFAR: I'm sorry. Because I'm sure we
20 have done this. We can go off the record.

21 MR. KRONENTHAL: Let's go off the record.

22 (Off the record.)

23 MR. HENDIFAR: So this is counsel for the
24 patent owner. We did attempt to ask the question from
25 Dr. Russ within the scope of the questions that my

1 colleague had asked on recross, and petitioner
2 objected. So we were not able to ask that question.

3 MR. KRONENTHAL: And I have -- yeah. I think
4 we are done. Thank you, Dr. Russ.

5 THE WITNESS: Thank you.

6 THE REPORTER: Counsel, did you need a copy of
7 the transcript?

8 MR. HENDIFAR: No.

9 (Deposition session concluded at 3:11 p.m.)

10 -oOo-

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12

13 I certify (or declare) under penalty of
14 perjury under the laws of the State of California that
15 the foregoing is true and correct.

16

17 Executed at _____ on _____.
(Place) (Date)

18

19 _____
(Signature of Deponent)

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) ss.

3 COUNTY OF ORANGE)

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5 I, Joanna B. Brown, hereby certify:

6 I am a duly qualified Certified Shorthand

7 Reporter in the State of California, holder of

8 Certificate Number CSR 8570 issued by the Court

9 Reporters Board of California and which is in full

10 force and effect. (Fed. R. Civ. P. 28(a)).

11 I am authorized to administer oaths or

12 affirmations pursuant to California Code of Civil

13 Procedure, Section 2093(b) and prior to being examined,

14 the witness was first duly sworn by me.

15 (Fed R. Civ. P. 28(a), 30(f)(1)).

16 I am not a relative or employee or attorney or

17 counsel of any of the parties, nor am I a relative or

18 employee of such attorney or counsel, nor am I

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20 (Fed R. Civ. P. 28).

21 I am the deposition officer that

22 stenographically recorded the testimony in the

23 foregoing deposition, and the foregoing transcript is a

24 true record of the testimony given by the witness.

25 (Fed. R. Civ. P. 30(f)(1)).

1 Before completion of the deposition, review of
2 the transcript [] was [] was not requested. If
3 requested, any changes made by the deponent (and
4 provided to the reporter) during the period allowed,
5 are appended hereto. (Fed. R. Civ. P. 30(e)).

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8 Dated: _____

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