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

SIEMENS MOBILITY, INC., GROUND TRANSPORTATION SYSTEMS
USA, INC., HUMATICS CORP AND PIPER NETWORKS, INC.,
PETITIONERS,

vs.

METROM RAIL, LLC.,

PATENT OWNER

Case No. IPR2023-00468-470
Patent Nos. 9,043,131 and 8,812,227

This is the videotaped discovery
deposition of KURT GUNTHER, taken in the above-entitled
cause before GWENDOLYN BEDFORD, a Certified Shorthand
Reporter within and for the County of Cook, State of
Illinois taken at MCANDREWS HELD & MALLOY, LTD. 500
West Madison Street, Suite 3500, Chicago, Illinois
60666 held on the 15th day of November 2023 at the hour
of 10:15 a.m. pursuant to notice.



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E X H I B I T S

DOCUMENTS	DESCRIPTION	MARKED
Exhibit 2009	Declaration	13
Exhibit 2010	Resume	13
Exhibit 1050	List of Metro Rail Patents	177
Exhibit 2030	Summary of projects and solutions that Piper has for the rail industry	194
Exhibit 2031	Helix by Piper	196

Note: Exhibits retained by Counsels.



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1 THE VIDEOGRAPHER: This is the taped
2 deposition of Kurt Gunther in the matter of Siemens
3 Mobility, Inc. et. al vs. Metrom Rail, LLC, being heard
4 before the United States Patent and Trademark Office
5 before the Patent Trial and Appeal Board. Case Number
6 IPR 2023-00468 and IPR 2023-470. This deposition is
7 being held at 500 West Madison, Chicago, Illinois 60661
8 on November 15, 2023. The time is now 10:16 a.m. My
9 name is Joseph Salinas. I'm the videographer. The
10 Court Reporter is Gwen Bedford.

11 Counsel, will you please introduce yourselves
12 and affiliations and the witness will be sworn in?

13 MR. WISNIA: Good morning. Howard Wisnia on
14 behalf of the Petitioner, Piper Networks, Inc., and the
15 remaining petitioners.

16 MR. RAHMEIER: Thatcher Rahmeier, present for
17 Ground Transportation Systems USA, Inc.

18 MR. GALLUZZO: Vince Galluzzo from Crowell &
19 Moring on behalf of the Petitioners.

20 MR. SCHODDE: Greg Schodde for Patent Owner,
21 Metrom, and with me on the Zoom is Raj Chiplunkar.

22 MR. NIEBERG: And this is Gregory Nieberg for
23 the Humatics Petitioner.

24 THE VIDEOGRAPHER: Would the Court Reporter
25 please swear in the witness?



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(WITNESS SWORN)

KURT ALLEN GUNTHER,
called as a witness herein, after having been first
duly sworn was examined and testified as follows:.

EXAMINATION

BY MR. WISNIA:

Q Good morning, sir. I'm Howard Wisnia. Nice
to meet you.

A Nice to meet you.

Q Would you kindly state your full name, your
home address and your work address?

A Sure. The work address, I'll have to
probably look at something to make sure I got that
right. Kurt Allen Gunther. My home address is [REDACTED]
[REDACTED], [REDACTED], Illinois. Do you need the
zip code, too?

Q Please.

A [REDACTED]. The work address, I work from home
most of the time and it's a newer address.

Q What town is it in?

A It's in Lakemore, Route 120 in Lakemore. I
couldn't tell you the number of the address there. I'm
sorry.

Q Who is your employer?

A Metrom Rail, LLC.



1 Q And what is your title there, sir?

2 A Director of Engineering.

3 MR. SCHODDE: One moment, Mr. Wisnia, Miss
4 Court Reporter, in the transcript that we filed can we
5 have redacted the home address?

6 MR. WISNIA: It's fine with me.

7 BY MR. WISNIA:

8 Q I'm sorry. You said your title was what?

9 A Director of Engineering.

10 Q All right. And how long have you worked with
11 Metro?

12 A About twelve years.

13 Q And in that twelve years, have you worked
14 with anyone else?

15 A No.

16 Q Correct.

17 A Let me clarify that for complete accuracy.
18 There has been other affiliated companies with Metrom
19 Rail that on occasion I have done some work for, but
20 primarily it's been Metrom Rail.

21 Q And who are those affiliated companies?

22 A Wayclear was one of them. Another one is
23 some initials, associates. And I don't mean it was
24 irrelevant to me. Just doing what it was, but same
25 ownership or affiliated in that sense.



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1 THE COURT REPORTER: Could you spell the name
2 of that? Wayclear?

3 THE WITNESS: Wayclear, W-A-Y-C-L-E-A-R.
4 BY MR. WISNIA:

5 Q So there's Wayclear and there is some other
6 entity with initials and they're both owned by the same
7 people that own Metrom?

8 A When you talk with Mr. Markey, he could
9 clarify that for you, because he would know all of
10 those details of those companies. He is, I'm sure,
11 involved in all of those entities.

12 Q Okay. And was your work with those companies
13 related to the railroad industry?

14 A No.

15 Q Okay. What industry was it related to?

16 A One of them was Ultraviolet Treatment of Air
17 basically COVID type thing to basically sanitize the
18 air. Well, actually, some of those might have been
19 rail related. There was some other ventures like track
20 geometry related type work that was under the name I
21 can't remember. We even did early on a little medical
22 project. I come from a medical product development
23 background. And at the time, I had also another guy
24 working with me who was very well experienced in that.
25 And so it was kind of a natural fit.



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1 There also was a company at the
2 beginning called Metrom, not Metrom Rail, that worked
3 in the fuel pump industry. And so I worked on what's
4 called a pulser. It's the device that measure your
5 fuel delivery when you are pumping gas at the station.

6 Q Okay. So they know how much they charge you?

7 A Yes. And what I did for them was I helped
8 finalize the development of a device that is a secure
9 pulser. Basically, it had prevented people from
10 cheating, overcoming the metering of the gas meter.
11 Got it.

12 Q This is gas for like an automobile, not gas
13 for your house?

14 A Yeah. You would use the product. You've
15 used it probably, not knowingly, yes, when you're
16 pumping gas at your car.

17 Q Great. Anything else?

18 A I think that's it.

19 Q All right. And, sir, have you ever had your
20 deposition taken before?

21 A I have never had a deposition taken.

22 Q Have you ever given testimony in a court or
23 in other sort of proceedings?

24 A I've never given testimony in a court. I've
25 given a statement before. I was a witness to a car



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1 accident. So I gave a statement for that. And I also
2 gave a statement one time where I was injured in an
3 accident. And so those two times, I think, are the
4 ones I can think of that I have done anything.

5 Q And when you say a statement, you mean like a
6 written declaration, kind of like what you did in case?

7 A Sort of. Basically it was just -- one of
8 them was by phone and they told me it was being
9 recorded and I'm sure it was transcribed. Another
10 situation was actually taken at a fire station. And so
11 they were, I think, actually had me write out my
12 statement. So it was in writing, but I handwrote it
13 out. That's many years ago. Actually, that was a
14 third one. I witnessed a car fire. And they had
15 misassigned the start of the fire because the car that
16 burned the worst was not the car that started the fire.
17 So I witnessed an accident. I witnessed the car fire,
18 and I was injured in an accident.

19 Q Understood. All right. I'm sure you did a
20 little preparation for today, but I'll kind of go over
21 some of the ground rules. There will be a lot of
22 questions and answers today. I'll do my best to try to
23 ask clear questions. I'm sure sometimes I'm going to
24 fail. If I do, just please ask me to clarify the
25 question.



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1 A Okay.

2 Q If you don't ask me to clarify, I'll assume
3 you understood the question. Fair enough?

4 A Fair enough.

5 Q By the same token, it's important that only
6 one of us speak at a time so that we can have a clear
7 record. As you can see, our Reporter is taking down
8 everything that you and I are saying.

9 A Understood.

10 Q So I'll do my best not to speak on top of
11 you. I just ask you that you give me the same courtesy
12 and try not to speak on top of me, okay?

13 THE COURT REPORTER: Because you're facing
14 that way. I need you to keep your voice up.

15 MR. WISNIA: Okay.

16 BY MR. WISNIA:

17 Q Also, it's important that we speak in full
18 words as opposed to "uh-huhs" or "huh-huh" or
19 headshakes and things of that nature, so the Reporter
20 can keep the record full.

21 A Okay.

22 Q We'll try to take a break every hour or so as
23 we go through the day. If you need a break at any
24 time, just let me know and we'll get to a break as soon
25 as we're done with the question or two.



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1 A Okay.

2 Q Is there any time today that you need to do
3 phone calls or need to take a break at a certain time?

4 A No. Just the regular breaks is my only
5 request.

6 (WHEREUPON Exhibit 2009 was
7 previously marked for
8 identification)

9 BY MR. WISNIA:

10 Q Sure. Absolutely. I'm going to ask you to
11 take a look at what's been previously marked in this
12 case as Exhibit 2009. And that is the Declaration of
13 Kurt Gunther in support of patent owner?

14 A I have that in front of me.

15 Q All right. What is that, sir? You may read
16 the title. What is that document?

17 A It's my Statement of Facts that seemed
18 relevant to this case.

19 (WHEREUPON Exhibit 2010 was
20 previously marked for
21 identification)

22 BY MR. WISNIA:

23 Q All right. And also, if you take a look at
24 Exhibit 2010.

25 A I don't have 2010 or is it back here? Yes.



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1 Okay. My resume? Yes.

2 Q And is 2010 the most accurate and current
3 resume that you have?

4 A Yeah, probably. It's not an absolute
5 complete listing of everything that I have ever done.
6 It's a summary that was more tailored to the rail
7 industry that I prepared previously for my company when
8 we were talking to potential customers.

9 Q Okay. And so is it just that additional
10 positions are missing from it or what would we need --

11 A No. All the employers would be listed in
12 there in terms of full time employment. It's just
13 there may be things that I was involved in, product
14 types, industries that I worked with that may not be
15 reflected in here. And the reason why that is, is
16 because my previous employer, Bit 7, was a product
17 development company and we dealt with a wide variety of
18 product lines and things like that.

19 Q Understood. Okay. So I see from your resume
20 that you Graduated with a Bachelor's Degree in
21 electrical engineering?

22 A Yes.

23 Q From the Illinois Institute of Tech in 1984,
24 is that correct?

25 A That is correct.



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1 Q All right. And do you have any sort of formal
2 education beyond a Bachelor's?

3 A I've taken a couple of classes probably along
4 the way, but no other formal education, but just a
5 single class, like a programming class, for example.

6 Q Understood. And your first job out of
7 college was with Zenith, is that right?

8 A That is correct.

9 Q Zenith. And what was your role at Zenith?

10 A I was an engineer. I worked in the Switching
11 Power Supply Group at Zenith.

12 Q Okay. Was that for like industrial power
13 supplies or you're talking about your televisions or
14 something else?

15 A No. It was switching power supplies. At the
16 time the IBM PC, for example, was a big thing and
17 Zenith made the power supplies that were used in the
18 IBM PC. And also a lot of IBM PC compatibles. We also
19 made power supplies for them.

20 Q Okay.

21 A So that was the primary focus.

22 Q Fair enough to say that the Zenith work was
23 unrelated to the railroad industry?

24 A That would be a very fair statement, yes.

25 Q All right. Was it related to UWB in any



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1 sense?

2 A No.

3 Q Did it have to do with electronic
4 communication at all?

5 A No.

6 Q And your next position, I see, is with Sun
7 Electric?

8 A Yes.

9 Q Is that right? All right. And what was your
10 role at Sun Electric?

11 A So again, I was an engineer there. Although
12 I did some project management as well. And at Sun
13 Electric we developed automotive diagnostic test
14 equipment like your mechanic would use when you take
15 your car into the garage.

16 Q So this is like, I don't know, it was like in
17 1986 or '92, but these are like those dongles that you
18 plug in and it reads all the --

19 A This is pre that. This is more of a device
20 that would roll around in the shop and they would hook
21 up to the vehicle to all various types of the vehicles.
22 So you could essentially diagnose the engine's
23 performance automatically.

24 Q Okay. Did that relate to the railroad
25 industry at all?



1 A It did not.

2 Q Did it relate to UWB?

3 A It did not.

4 Q And did it relate to electronic
5 communication?

6 A It did not.

7 Q All right. Your next position, I believe, is
8 with Bit 7, is that right?

9 A That is correct.

10 Q And between each of these positions, you went
11 from one job to the other. There was no extended
12 period?

13 A That is correct.

14 THE COURT REPORTER: I need him to wait until
15 you finish asking your question. So give it like a
16 second.

17 THE WITNESS: My apologies.

18 BY MR. WISNIA:

19 Q So the question was, as you moved from job to
20 job, maybe you took short vacations, but there was no
21 extended period of you not working as you went from
22 these places, from one place to another?

23 A There is one exception to that, between Bit 7
24 and Metrom Rail --

25 Q Okay.



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1 A -- there was technically a several month gap,
2 but I actually continued working for Bit 7 on a
3 contract basis through most of that or at least a
4 portion of that. So there really wasn't really a break
5 to speak of.

6 Q Okay. And what was your role at Bit 7?

7 A Bit 7 was a product development company.

8 Q What does that mean?

9 A So other companies would hire us to do
10 product development. So we didn't develop products for
11 ourselves. We developed them for some other company.
12 And so we had multiple customers. And that meant that
13 we worked in multiple industries. There's a few
14 industries probably that we didn't work in. One of the
15 things that we did a lot of was medical product
16 development. But we also worked in things from the
17 Neutrino Observatory at the South Pole to a fly
18 catcher, zapper. Not really a zapper, but a fly --
19 insect control device that would mount on a restaurant
20 wall. A wide variety of things like that.

21 Q Okay. And it looks like through your years
22 at Bit 7 you had different titles and maybe had
23 different management responsibilities. Were you always
24 a hands on engineer throughout your time at Bit 7 or
25 were you managing projects at some point?



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1 A I was always a hands on engineer all the way
2 through. I always generated revenue, which was, if I
3 wasn't designing stuff. Project management could
4 generate revenue, but usually I was involved
5 technically.

6 Q Okay. And so you mentioned the medical
7 field. What other fields -- well, let me strike that
8 and ask you a question.

9 I understand the business was involved
10 in a lot of fields. I want to focus on what you
11 personally were involved in.

12 A Right.

13 Q So what technologies were you personally
14 involved in at Bit 7? I mean disciplines. I don't
15 mean specific products.

16 A I did some like switching power supply
17 development. There was all types of sensing devices
18 from pressure sensors. I'm having a hard time
19 remembering some of the devices, but explosive gas
20 sensors, oxygen sensors, nitrogen dioxide, various
21 chemical sensors, ultraviolet light generation to
22 sanitize medical fluids. If I think long enough, I
23 could think of a bunch more, but those are the things
24 that are coming to mind at the moment.

25 Q Okay. So medical was a field that you worked



1 in. It sounds like maybe industrial chemicals,
2 processing may have been another one, just from what
3 you're saying to me?

4 A Yeah. As an example, industrial processes.
5 I worked on a project that was essentially a laboratory
6 in a box that was at a metal machining facility. It
7 checked the integrity of the cooling fluids. So it was
8 continually checked so that rather than wait until it
9 caused a problem, you would know it's time to change
10 the fluid.

11 Q Understood. Was any of that work related to
12 the railroad industry?

13 A There was one project that you could say was
14 somewhat rail related.

15 Q What was that one?

16 A The O'Hare Airport transit system was having
17 difficulty with their supplier, the provider of the
18 transit system. And so I reverse engineered, I believe
19 seven assemblies on that system so that they could
20 continue receiving spare parts. So that consisted of
21 understanding how the existing device worked, sometimes
22 with no documentation or very limited documentation,
23 and then designing the replacement, and then actually
24 fabricating it, building it, and testing it and
25 delivering it.



1 Q Okay. And so you have an entry here on your
2 resume, which I assume is what you're talking about
3 that says, "Reverse engineered several short range 69
4 kilohertz to 120 kilohertz --

5 A Yes.

6 Q -- "...wireless communication transceivers
7 which mount under the vehicle."

8 A Yes.

9 Q That's the project we're talking about?

10 A Yes, that is the project.

11 Q Okay. Can you give me some more detail about
12 that? What specifically are you talking about with
13 respect to the vehicle? First of all, what vehicle are
14 we talking? We're talking about the thing that takes
15 you from terminal to terminal?

16 A Yes. And if you rented a car when you flew
17 in, if you flew into O'Hare, you might have taken that
18 to the rental facility.

19 Q Okay. Go ahead. Please continue.

20 A So the wireless communication transceivers --
21 underneath the vehicle there are multiple -- first, let
22 me clarify. The vehicle they have now is a
23 replacement. So it's not the one I worked on.

24 Q Okay.

25 A It was replaced several years ago. The



1 vehicle, when it traveled down the tracks, there is
2 actually multiple communication systems, short range,
3 less than a foot distance down to the track. And they
4 used various frequencies, but they're all low frequency
5 near field type systems. So that's like the 69
6 kilohertz, 120 kilohertz.

7 Q And what were they used for?

8 A When you came to a station, you would get an
9 announcement. "We are now approaching the station.
10 Please hold on." That actually was transmitted at the
11 station on the ground. And it came to the vehicle. So
12 rather than being recorded in the vehicle, that data
13 was transmitted to the vehicle that was appropriate to
14 where it was at.

15 Q I'm sorry, I didn't quite follow. Can you
16 just explain that again?

17 A So there are audio announcements in the
18 vehicle, and one of the communication paths was through
19 a near field system underneath the train that would
20 couple wirelessly to the train.

21 Q Okay. So when the train would pass over
22 this --

23 A You'd get an announcement appropriate to
24 where you're at, at the moment.

25 Q And that announcement was originating from



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1 where?

2 A The central control facility that controlled
3 the O'Hare Transit System.

4 Q And so some other company had built and
5 delivered the system to O'Hare, but for whatever
6 reason, O'Hare couldn't get the service they wanted
7 from them?

8 A Yes.

9 Q And so Bit 7 went and kind of reverse
10 engineered so they could make a copy of it for them?

11 A Correct. They needed replacement parts to
12 continue operating the system.

13 Q Okay.

14 A And so we helped them to maintain operation
15 of the system.

16 Q How did you go about reverse engineering so
17 you can make a copy of the system?

18 A First, I would talk with the individual who
19 was familiar with it. And there is generally one
20 individual who was quite familiar with the operation of
21 the system.

22 Q This is an O'Hare employee?

23 A Yes. The O'Hare Airport Transit System.

24 Q Okay.

25 A And so he would give me whatever technical



1 information he had, both in his mind as well as any
2 documents he may have. Sometimes he had limited
3 documentation, but never was there a schematic. The
4 schematic I reverse engineered by actually examining
5 the circuit, examining the components, and created a
6 schematic based upon that.

7 Q Okay. And so there's the part that was
8 embedded in the rail or near the rail. And then there
9 was the part that was on the vehicle. Which part are
10 you talking about?

11 A The vehicle. In the rail there is just a
12 tray that had coils in it. And so the train is moving
13 over coils that are zigzagging like Figure 8's --

14 Q Okay.

15 A -- underneath it. Everything I worked on was
16 mounted on the vehicle.

17 Q Okay. All right. And so you're saying these
18 things were transceivers. Were they communicating down
19 into the rail or were they actually --

20 A They were all unidirectional, as far as I can
21 recall. So it was all probably receiving. I think
22 they were all receivers, yes, on the vehicle.

23 Q All right. And so they would receive
24 basically just a notice that I'm at Spot X or
25 something. Is that really the data they're collecting?



1 A Well, it was either audio announcements or it
2 was the way the vehicle could tell how fast it was
3 going, because every crossover it passed there would be
4 a zero crossing on the signal, and by timing that, the
5 vehicle could determine how fast it was going.

6 Q Just like a ground speed?

7 A Yes. Ground speed. And that is how the
8 system determined how fast the vehicle could go. It
9 was actually programmed into the track by how often a
10 crossover occurred. So if a crossover in the wire
11 occurred every ten feet, the train would go a certain
12 speed. If it was every five speed, the train would go
13 at a different speed, a faster speed.

14 Q Okay. So basically that's how they regulated
15 the speed --

16 A Yes.

17 Q -- is by these crossovers that you're talking
18 about in the rail. Interesting. All right, how long
19 was that project?

20 A I believe there were seven projects that went
21 on for a few months each time over the course of
22 several years, I believe, until finally the supplier
23 realized they didn't have quite the control they had
24 and they decided maybe to cooperate more.

25 Q Understood. Now, you were with Bit 7 for



1 quite a period of time --

2 A Yes.

3 Q -- from '92 to 2011. This project for the
4 O'Hare vehicle is -- are what years?

5 A I don't recall. I would say it probably was
6 in -- more towards the first decade that I worked at
7 Bit 7.

8 Q Probably sometime in the '90s?

9 A Probably.

10 Q Okay. All right. So you reverse engineered
11 so that -- you're saying there were seven different
12 receivers that you had to make copies for?

13 A Yes. They weren't all receivers. Another
14 receiver was -- that vehicle was actually on rubber
15 tires.

16 Q Okay.

17 A And so there was a much older version of tire
18 pressure detection. And when the tires passed by
19 periodic sensors, there it was transmitting
20 essentially. Well, it really wasn't transmitting. It
21 was modifying a transmitted signal as it went by that
22 would allow you to determine that tire -- that pressure
23 was low. But there was two other things I worked on
24 that that was actually the HVAC control system in the
25 vehicle, the AC and the heater control.



1 Q Okay. All right. So you have another entry
2 here in your CV that says, "Created and manufactured a
3 sensor which detected low tire pressure and
4 communicated pressure faults via near field RF to the
5 system controller."

6 A Yes.

7 Q Is that what we're talking about?

8 A Yes.

9 Q Okay. So were you -- is that something from
10 scratch you worked on or again, there was the same
11 issue, that they had a recalcitrant supplier that you
12 needed to reverse engineer so that they could go on
13 with life?

14 A It was the same situation. They had actual
15 physical samples of the device. They had some
16 knowledge of how it operated, but I didn't have a bill
17 of material or a schematic. I had to reverse engineer
18 from actual physical samples.

19 Q Okay. And so I know now in my car and I
20 think most cars you have these things I think it's
21 called TPC, which are these low pressure sensors in the
22 car? Do you know what I'm talking about?

23 A Yes, I do.

24 Q Is it called "TPC", do you know?

25 A Tire Pressure Monitoring Systems, TPMS,



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1 maybe?

2 Q That sounds right.

3 A TPMS, Tire Pressure Monitoring System.

4 Q Okay. Did that exist at the time you were
5 working on these tire pressure monitors?

6 A I highly doubt it. I don't believe so.

7 Q Okay. All right. The Tire Pressure Monitor
8 we're talking about, was that again in this first
9 decade of your work at Bit 7 you think?

10 A Yes, that was actually the first project I
11 did for them.

12 Q Okay. And was that like a common issue that
13 you guys would work on at Bit 7 where you guys had to
14 come in and basically reverse engineer products for
15 customers because they were having difficulty with some
16 sort of other supplier?

17 A No, I wouldn't say that. Usually we were
18 actually starting more from scratch or we were helping
19 complete a project that had not gone well.

20 Q So in other words, the customer had done some
21 internal development or they had another contractor,
22 and they realized they weren't going to get there with
23 what they were doing, and you guys would step in, is
24 that what you're saying?

25 A That's correct. That was often the case. A



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1 project was in trouble and we would rescue the project.

2 Q All right. And at some point you left Bit 7
3 to join Metrom Rail. Why did you leave Bit 7?

4 A We actually shut down Bit 7.

5 Q Okay.

6 A There was a really tough economic time and
7 nobody was developing products. So we decided to stop
8 operations before we dug a deep hole.

9 Q Understood. At Bit 7, did you work on any
10 UWB projects?

11 A I did not.

12 Q Did you -- aside from this project with
13 O'Hare, did you work on any other sort of communication
14 projects at Bit 7?

15 A At Bit 7 there was -- I think I worked on
16 maybe two projects that had radio frequency devices in
17 them. My recollection is really foggy on those. And I
18 also worked on electromagnetic compatibility issues.
19 Any device that you have, a digital device, including
20 that mouse you have sitting in front of you, can emit,
21 because it has a processor in there, can emit energy
22 and you have to comply with regulations on that. So
23 working on those types of systems gave me some -- made
24 me have to be cognizant of radio frequency operation,
25 because even though it's not an intended receiver or



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1 transmitter, it is a transmitter. And so that
2 sensitized me to radio frequency type issues.

3 Q Okay. Crosstalk and --

4 A Yeah. Crosstalk would be one thing.

5 Q All right. I understand some of these
6 projects had RF components, but were you the RF
7 engineer on it or you just had to deal with the fact
8 that you may get some noise or crosstalk?

9 A On the electromagnetic compatibility issues I
10 was the engineer dealing with those issues.

11 Q Okay.

12 A Many of those times it was a company that had
13 a problem. They had failed miserably the testing. And
14 so my job was to get them to pass the testing. So
15 there was an existing design that I had to correct for
16 that issue.

17 Q When you say "the testing", are you talking
18 about some sort of government regulation or what do you
19 mean?

20 A Like FCC has regulations for electromagnetic
21 emissions unintended. And so you go to a test lab. UL
22 provides that. There's other test labs in the area.
23 And you go to them and they test against a published
24 standard. And if they don't pass the standard, then
25 they're not legally able to sell the product.



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1 Q Okay. And so you would realize they would
2 tell you, we're failing these tests? We have some sort
3 of -- it's effectively signal pollution, right --

4 A Correct.

5 Q Problem? And you would address it by what,
6 dealing with what the housing was made out of, how much
7 power was at stake, like how are you dealing with it?

8 A Usually the issue was actually in the circuit
9 design itself.

10 Q Okay.

11 A Things such as circuit board layout. You
12 could have a simple feature on the circuit board that
13 makes it a very effective transmitting antenna. So in
14 one situation, a customer was so far out of limits that
15 it was hard to imagine that could be even possible.
16 But the primary fix I found was a simple little feature
17 in the circuit board that contributed the majority of
18 that.

19 Q Okay.

20 A And that took an understanding of RF
21 transmission characteristics that a lot of people think
22 is black magic. But when you understand the physics,
23 it helps you know what to look for.

24 Q Understood. All right. So in a 2011 time
25 frame, Bit 7 decides that they're going to have to wind



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1 down the business. And you decide you're going to go
2 look for a new position. How did you come to interview
3 or meet the folks at Metrom Rail?

4 A I received a call from a recruiter that I had
5 really never dealt with, but I knew him, and he told me
6 he had a job for me that matched my abilities.

7 Q And that was an interview with Metrom?

8 A Yes.

9 Q All right. And what did you understand the
10 projects and the skill set they were looking for when
11 you joined Metrom?

12 A My charter for Metrom was to create the
13 engineering team to develop products to improve safety
14 in the rail industry.

15 Q So was Metrom existing when you joined?

16 A I was officially the first employee for
17 Metrom Rail.

18 Q Okay.

19 A There was another company called Metrom,
20 which was the fuel pump metering system. And there may
21 have been a couple other things going on. And I think
22 there was Metrom Performance, which made aftermarket
23 parts for the automotive industry. But I was the first
24 official employee of Metrom Rail.

25 Q Okay. How many people were at Metrom or the



1 other Metro entity that you mentioned?

2 A I would say about ten people at that time.

3 Q Okay. Between the two entities?

4 A Yes. Initially when I started. But then I
5 hired people pretty quickly because we had several
6 projects to pursue.

7 Q Sure. And so who were the owners or -- well,
8 who were the owners of Metrom when you joined?

9 A There were several investors that I really
10 wasn't acquainted with. Jim Markey, though, was
11 certainly one of the owners. I believe Rick Carlson
12 was also an owner. He was my direct boss. And there
13 was another individual who was the General Manager.
14 His name was Tony Scala, who also, I believe, was an
15 owner.

16 Q How do you spell Mr. Scala's name?

17 A S-C-A-L-A.

18 Q Okay. And this is my belief. I didn't have
19 documentation of this, but that's my understanding.

20 A Okay.

21 Q And was Mr. Scala an engineer?

22 A He was not.

23 Q Was he involved in product development?

24 A He was not.

25 Q What was his role?



1 A Finance.

2 Q Okay. And what about Mr. Carlson?

3 A Mr. Carlson was involved in development. So
4 he was managing me, but we also collaborated
5 significantly on development projects. And he has an
6 engineering background.

7 Q For example, who did the technical work on
8 this gas metering stuff before you joined?

9 A Some company in India.

10 Q Okay.

11 A And the project was lagging. It wasn't
12 working. So even though I was hired to work on rail
13 things, the day I walked in, I was asked if I could do
14 a little detour.

15 Q Understood. And so it sounds like, and tell
16 me if I'm wrong, before you joined, Metrom was not in
17 the railroad business, but they wanted to get into it
18 and part of getting into that was hiring you, is that
19 fair?

20 A There's a little more nuance to that.

21 Q Okay.

22 A There was another individual who was leading
23 the investigation of the products they wanted to
24 develop. It may have been only for a matter of a
25 couple of months, but this individual was having some



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1 challenges that was affecting his performance and so I
2 replaced him.

3 Q Okay. So there was a previous engineering
4 head or whatever the right term is?

5 A Brief effort. Yes.

6 Q And I'm not going to delve too deep into
7 this, but it was some sort of personal non-work
8 challenges is what you're saying?

9 A I don't know the nature of it, because I've
10 never worked with the individual. He interviewed me.
11 And then when I started, he was no longer there.

12 Q What did you understand at the time you were
13 interviewing was the vision of what Metrom wanted to do
14 in the rail business?

15 A At the time there was two products that they
16 had in mind that they wanted me to lead the development
17 of. One was what came to be known as Crossing Warning
18 Enhancement. And that consisted of an auxiliary system
19 to detect train approach to a railroad grade crossing
20 and initiate the gates if the existing system failed to
21 do that.

22 Q And what was the initial system?

23 A The initial system is, for example, GCPE, I
24 believe, is one of the initials for them, Great
25 Crossing Predictor. There's a couple of other devices,



1 but basically they detect the shorting of the rail by
2 the train.

3 Q Okay.

4 A And that triggers the gates. The problem is
5 that when you have light trains and dirty rails
6 sometimes they don't reliably detect the train
7 approach.

8 Q Okay.

9 A And the result can be disastrous.

10 Q All right. So you called that --

11 A CWE, Crossing Warning Enhancement.

12 Q All right. So that was the one area. What
13 was the second area?

14 A The second one was Collision Avoidance System
15 For Railway Maintenance Machines.

16 Q Okay. What was the -- what did you
17 understand was kind of the state of that work at the
18 time you joined?

19 A When I joined there was some, several
20 concepts that had been created by my predecessor. So I
21 had that sheet to look at. It was a one-page list of
22 some concepts that was to be presented to the
23 prospective customer.

24 Q And what were the concepts, if you recall?

25 A I don't remember very well, because I didn't



1 use any of those. But I do recall one of those was
2 using a narrowband radio for ranging. And I had
3 concerns about its performance in a terrestrial
4 application. So I didn't want to go down that path.

5 Q Okay. What was the name of your predecessor?

6 A I don't recall because I only met him once
7 and his name never really came up after that.

8 Q Okay. Why did this company, Metrom, if you
9 know, that was kind of in what appears to be an
10 unrelated area, decide that they wanted to work on
11 these projects and railway? What was the impetus, so
12 to speak, if you know?

13 A Somehow they knew of an opportunity on a
14 sales side of things perhaps. But I don't know for
15 certain how that came about. I just knew that we had
16 ability to meet with an interested railroad looking for
17 a solution.

18 Q Is that the Canada project?

19 A The Canadian National.

20 Q So had Canadian National asked for a
21 particular type of product or a particular solution to
22 some problem that they were having, as far as you know?

23 A I believe so. Again, I wasn't privy to the
24 original conversation with them. My first meeting with
25 them was presenting concepts for collision avoidance.



1 So that clearly was a felt need that they had because
2 they were giving us time to present that solution and
3 then they gave us an opportunity to demonstrate the
4 solution.

5 Q And so what is your understanding of the
6 scope? What did they want for collision avoidance?
7 What were you asked to do?

8 A What I found as I got to know them is that
9 they were having collisions of 15 to 20 railway
10 maintenance machines annually and they wanted to stop
11 it. And so they were looking for a solution to stop
12 that somehow. I don't know how they communicated that,
13 because, again, that predated my appearance on the
14 scene. I just knew that they were looking for a
15 solution because they were quite willing to listen to
16 the suggestions I had for creating the solution.

17 Q Understood. And so, how were they attempting
18 to avoid collisions at that time?

19 A They have operating rules and they generally
20 have two modes of operation. They call it work and
21 travel.

22 Q Okay.

23 A Work mode was under ten miles an hour.
24 Travel mode is above that. And the maintenance
25 machines generally are limited to 25 miles an hour.



1 When they're in work mode, they could be in close
2 proximity relative to travel mode because the speed
3 that they're moving at. So, for example, they might be
4 allowed to be within 50 feet of each other when they're
5 below ten miles an hour.

6 Q Okay.

7 A But if they're above ten miles an hour, they
8 need to be 300 or 400 or 500 feet apart. So they just
9 had spoken rules or written rules of operation.

10 Q Okay.

11 A The challenge, though, is that the operator
12 can be distracted, can be fatigued, and some of the
13 machines have horrible sight lines. So it's actually
14 hard to see ahead, but you can see the work that you're
15 doing really well because that's what they're focusing
16 on in terms of the design of the machine. So once I
17 saw the railway maintenance machines, it became obvious
18 to me why that was an issue, simply by the design of
19 the machines.

20 Q Okay. All right. So what month did you join
21 Metrom, if you recall?

22 A March.

23 Q March of 2011. And when did you first have
24 your first meeting with the folks at Canadian National
25 where you're kind of presenting ideas?



1 A Before I started.

2 Q Okay. So tell me a little bit of that story,
3 if you don't mind.

4 A So I interviewed and I was doing a little
5 consulting work for a former client of Bit 7.

6 Q Okay.

7 A That was just wrapping up. What ended up
8 happening was I interviewed. I accepted the position
9 and then I got a call from my boss saying could you
10 join us for a meeting the Thursday before I started? I
11 started on Monday. Asked me to join him at a customer
12 meeting on Thursday prior.

13 Q You're saying you got a call for your new
14 boss?

15 A For my new boss.

16 Q Okay, which is Carlson?

17 A Yes.

18 Q Okay.

19 A So he sent me the concept sheet that I told
20 you about and I studied that. And then I went in with
21 him on this meeting before I started officially.

22 Q All right. And just give me the days again?

23 A Thursday and then I started on Monday.

24 Q They called you when?

25 A Tuesday or Wednesday.



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1 Q In the same week. Hey, can you come with me?
2 A couple of days from now we're going to go have this
3 meeting?

4 A Yes. He was testing me.

5 Q All right. And so tell me a little bit about
6 that meeting, if you don't mind?

7 A It was a meeting with a single individual.
8 He was the man who managed the work group for Canadian
9 National, the Maintenance of Way work groups.

10 Q Okay.

11 A He was a seasoned railroad man, not a
12 conversationalist. Just give me the facts. I
13 perceived him as being skeptical, but interested and a
14 bit roughened over the years working for a railroad.

15 Q Okay. What's this gentleman's name?

16 A I can't recall at the moment. It may come to
17 me later, but I can't at the moment. Sorry.

18 Q And were you presenting concepts already at
19 this meeting or is this just a get to know you?

20 A No, I was presenting concepts.

21 Q Okay. And what concepts were you presenting?

22 A I was presenting initially the concepts that
23 my predecessor had prepared.

24 Q Okay. Which, well, you know, one of them was
25 this narrow bend ranging?



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1 A Correct.

2 Q What else, if you recall?

3 A I don't recall.

4 Q All right.

5 A The last time I looked at that was that
6 meeting, because I had a better idea.

7 Q And what was that?

8 A I had heard about Ultra-Wideband through my
9 technical investigations, and I surmised that these
10 machines would have issues in certain areas with GPS.
11 So we needed something to measure the separation
12 distance of machines in areas that you wouldn't have
13 GPS, as well as get high accuracy at short range, which
14 GPS was not particularly good at. So I immediately
15 thought of Ultra-Wideband as a solution for that. Not
16 having any experience with Ultra-Wideband, but just
17 some knowledge from my studies.

18 Q When you say your studies, you mean just kind
19 of like reading IEEE, talking to friends? Maybe just
20 kind of fill that out, if you wouldn't mind?

21 A Primarily trade magazines.

22 Q Okay. What kind of trade magazines?

23 A Electronic Design News. Electronic Design.

24 Q All right. And what did you understand that
25 UWB was being used for at that time? And how did you



1 think it was going to solve your problem here?

2 A I didn't know of it being used for anything
3 at that point.

4 Q Okay.

5 A I just knew that it was a concept, at least
6 as far as I knew, that would give you a very wide
7 bandwidth and that wide bandwidth I knew would address
8 multipath issues or would help lessen multipath issues,
9 reflections off of objects that can fool you into
10 thinking the distance is further than it really is.

11 Q Okay. You're talking about in a ranging
12 sense that what you're concerned about is that you're
13 going to send out your signal and it's not going to
14 just bounce off what you're trying to measure straight
15 back to you. It's going to go like an old cartoon,
16 like ding, ding, ding, and then it's going to come back
17 to you. Is that what you mean?

18 A Right. And you would measure an exaggerated
19 path as a result, which is problematic for collision
20 avoidance.

21 Q Sure. And this idea that it would be better
22 for addressing the multipath issue, I mean was that
23 known with UWB or is that something that maybe you just
24 thought, oh, geez, that could work well for it?

25 A I don't know for certain. I knew that



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1 Ultra-Wideband used very wide bandwidth, hence the
2 name. And I knew that multipath was due to the
3 wavelength of a signal being just right for a
4 constructive reflection. If you change the wavelength,
5 you may not have a constructive reflection and it's no
6 longer going to fool you. I knew that from the RF
7 theory that I had studied.

8 Q Okay. All right. So did you have this idea
9 even before you started the job?

10 A It's murky.

11 Q Okay.

12 A It's possible that when I first was presented
13 the issues that I thought of that or it came weeks
14 later. I don't recall the genesis of it.

15 Q All right.

16 A Working at Bit 7 I was faced with multiple
17 technical challenges and sometimes I had to deal with
18 them live with a customer. And so I'd become pretty
19 adept at coming up with ideas or solutions on the fly,
20 but ones that I was confident I could live with. It
21 was just kind of a skill that I had gained over nearly
22 20 years at Bit 7.

23 Q And so going back to the meeting, you're
24 presenting some concepts, doing your best, but you
25 already know in your head that this is not really what



1 you're going to go forward with.

2 A I wasn't thrilled with those ideas.

3 Q So how were they received? Give us a little
4 bit more color as to the meeting, if you could.

5 A Well, that was my first introduction to the
6 rail industry directly anyway. And I realized that
7 technology was not king in the rail industry. It
8 seemed to be a bit more seat of the pants old
9 technology, not real excited to accept new technologies
10 or not fast to accept them. And the sophistication
11 level from a technical standpoint was not like I'd
12 experienced in other industries.

13 Q Okay. And when you say "seat of the pants",
14 what do you mean by that?

15 A They could understand things they could see
16 and touch much better than more esoteric technical
17 concepts.

18 Q So in this meeting was this gentleman that
19 we're talking about that ran the Maintenance of Way
20 cruise at Canadian National it's you, I assume it's
21 Mr. Carlson?

22 A Yeah. It's just Carlson, myself and this
23 man.

24 Q Okay. So were you getting a sense of the
25 industry or just how this guy operated? This



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1 gentleman, I mean, by that's the Canadian National
2 person?

3 A Yeah. My memory is vague, but I think I met
4 some other individuals at that time. And one of the
5 things that I had to do in my role at Bit 7 because not
6 only did I develop products, I had to market our
7 services to people. And so I had a lot of experience
8 sizing up my audience. And so I remember having that
9 perception that day, and then I continued meeting with
10 other individuals on this project as well as the CWE
11 project. And so that perception was strengthened on
12 those subsequent meetings with these other individuals.
13 So it's not all based on this one individual in one
14 meeting. There was a number of people I met with.

15 Q Okay. And the gentleman that we're talking
16 about in this meeting, I understand you can't remember
17 his name?

18 A It's almost there.

19 Q I mean he managed the maintenance workers, is
20 that what we're saying?

21 A I believe he supervised basically the entire,
22 at least United States portion of work equipment. It
23 may have been in Canada as well.

24 Q So was he a technology guy or was he more
25 kind of a manager of people and projects?



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1 A I don't know his background with any
2 certainty at all. And we never had any offline
3 discussions about his background.

4 MR. WISNIA: Okay. Well, we've been going
5 for about an hour. Would you like to take a break?

6 THE WITNESS: Sure. Yes.

7 MR. WISNIA: Go off the record.

8 THE VIDOGRAPHER: Going off the record at
9 11:14 a.m.

10	(BRIEF RECESS)
----	----------------

11	THE VIDOGRAPHER: Going on the record at
12	11:30 a.m.

13 BY MR. WISNIA:

14 Q Sir, you understand you're still under oath?

15	A	Yes, I do.
----	---	------------

16 Q All right. The information that you got
17 about what Canadian National wanted about the project
18 that came from Mr. Carlson?

19	A	I believe so.
----	---	---------------

20 Q Okay. I assume over time maybe you got some
21 further information or no?

22 A I don't believe there was any formal
23 communication that I recall, but I probably did from
24 conversations with various people I met with. It's far
25 enough back. I don't remember many specifics in that



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1 respect. But we probably visited a work site. I know
2 we went to the maintenance facility where they
3 maintained their maintenance machines and inspected a
4 number of machines to get familiar with the equipment
5 that we would be dealing with. And I'm sure I asked a
6 whole bunch of questions about the equipment and how
7 it's used, et cetera.

8 Q So all the folks that you spoke with, were
9 they Canadian National?

10 A Technically, they probably were Illinois
11 Central at that point, but it's Canadian National was
12 their owner.

13 Q Okay.

14 A We also along the way, and I can't remember
15 the exact timing, but we also were talking with people
16 at BNSF.

17 Q What is that?

18 A Burlington Northern Santa Fe.

19 Q Okay. When were you speaking to those folks?

20 A Sometime probably within six months of my
21 start, I would guess. I couldn't tell you that with
22 certainty. That's a vague idea.

23 Q Did you make a presentation to them?

24 A Yes, we did. So that was a situation where I
25 had the opportunity to be there from the start.



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1 Q Okay.

2 A And I do remember that meeting because I felt
3 empathy for the individual that we were meeting with.
4 Again, it was initially a single individual. And he
5 was talking about how he had 30 to 35 collisions
6 between railway maintenance machines each year, and it
7 seemed like no matter what he did, procedural
8 modifications, training, he couldn't get that to drop.
9 And so he's one I can say was definitely motivated for
10 a solution.

11 Q What was that gentleman's name, if you
12 recall?

13 A I don't think I'll even remember that one if
14 I try for a while, too.

15 Q Okay. Did you guys eventually do a project
16 for BNSF?

17 A We did not. We did a demonstration for them,
18 and that's when we met this gentleman's supervisor.
19 And he was not real enthusiastic about anything. So
20 that nothing happened with them that I'm aware of at
21 that point.

22 Q Okay. So you guys have a product that you
23 call "Aura"?

24 A Yes.

25 Q When did you guys first make Aura?



1 A I don't fully understand what you're asking.

2 Q It was a bad word question. Let me ask you
3 again.

4 The project that we're talking about
5 today that you talked to Canadian National about, is
6 that what became Aura?

7 A Yes.

8 Q And when did you first have a working
9 prototype of Aura?

10 A Do you mean a representative of production
11 working prototype or a proof of concept?

12 Q Let's start with proof of concept.

13 A Initially, most of my attention was on the
14 Crossing Warning Enhancement Project. So there wasn't
15 a lot of activity initially on the collision avoidance.
16 That was more background. And I can't remember the
17 timeline, but we put together a proof of concept
18 essentially using embedded touchscreen PCs and some of
19 our own electronics, probably early the following year.

20 Q Early 2012?

21 A 2012. And that was what we used for
22 demonstrations with CN and BNSF.

23 Q I think you've answered this, but I just want
24 to make sure. So the information that you got about
25 what Canadian National wanted for the project came from



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1 people that worked for Canadian National or this --
2 would you call it --

3 A Illinois, Central.

4 Q -- the legal corporation?

5 A I think that we actually were dealing with
6 owned by Canadian National.

7 Q Okay. And then I assume Mr. Carlson told you
8 before the meeting basically what it was going to be
9 about?

10 A Usually.

11 Q All right. And then you mentioned that they,
12 being Canadian National, and actually both them and
13 BNSF had these historic issues with Maintenance of Way
14 collisions?

15 A Yes.

16 Q Were they concerned about train to train
17 collisions? Was that a problem that they had
18 experienced?

19 A I was dealing with the maintenance
20 supervisor. So that wasn't in his purview. So that
21 was nothing. We never really discussed anything along
22 those lines. When I dealt with people on the Crossing
23 Warning Enhancement, for example, it was completely
24 different people.

25 Q All right. And do you have an employment



1 agreement with your employer?

2 A I believe so. It's been a long time since I
3 signed that, but, yes, I believe so.

4 Q Sure. Do you know when you signed it?

5 A I would assume I signed one in late March of
6 2011, and I probably signed a revised one sometime
7 several years later.

8 Q Okay. So the one in late March of 2011 is
9 after you started after the Monday that you started or
10 that Monday or something?

11 A Yes. Okay.

12 Q And then you said you signed a revised one.
13 Why did you sign a revised one?

14 A I don't know entirely. It could be that the
15 one individual that was no longer with Metrom Rail
16 didn't do a very good job of filing. So they maybe
17 couldn't locate it. So they needed to refresh it.

18 Q Okay. Understood. All right. So you've
19 made presentations to Canadian National and you made
20 presentations or multiple presentations to BNSF. Who
21 else have you made presentations to with respect to
22 Aura?

23 A Aura became a trademark for Ultra-wideband
24 Collision Avoidance and other related types of things.
25 So that would be a long list of entities. Because it



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1 was not just the Collision Avoidance Maintenance of Way
2 System. It became also pursuing opportunities in the
3 transit arena.

4 Q Transit being what, like trucks?

5 A No, transit as in rapid transit, subways,
6 entities like the CTA, the MBTA --

7 Q Okay.

8 A -- New York City Transit.

9 Q All right. So I don't want to get caught up
10 on the trademark thing. So I want to focus on what you
11 understand to be the invention. Let me back up for a
12 second.

13 You understand there's two patents at
14 stake in this case, right?

15 A You talking about the 131 and the 227, right?
16 Those are the patents you're speaking of?

17 Q The 131 and I believe you have the other one,
18 right, the 227?

19 A Yes.

20 Q All right. What do those patents have to do
21 with?

22 MR. SCHODDE: I'm sorry. Could you read that
23 back, please?

24 (WHEREUPON the record was read as
25 follows:



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1 "Q What do those patents have to
2 do with?"

3 MR. SCHODDE: Objection to form and
4 foundation.

5 BY MR. WISNIA:

6 Q What do those patents relate to?

7 A Well, that's the reason why when you asked
8 the Aura question, I was having some difficulty because
9 originally Aura was for the Collision Avoidance System,
10 but we realized that there was other applications for
11 it. And so we took that Collision Avoidance System and
12 applied it to other challenges.

13 Q Such as what?

14 A Precision berthing. So when a train car
15 comes into a station to make sure it stops at the
16 appropriate point. You don't open the doors and the
17 people step off into nothingness. Ultimately to train
18 control, keeping trains knowing where their position
19 is. So it all naturally flowed into those
20 applications. So I have a hard time delineating that
21 difference because it's just a continuum of
22 opportunities that we pursued.

23 Q And you're saying berthing, B-E-R-T-H-I-N-G,
24 right?

25 A Correct. Not childbirth, but positioning,



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1 which is called berthing in the industry, B-E-R-T-H.

2 Thank you for clarifying that for her.

3 Q So in your view, the 131 and 227 patents, in
4 addition to the Collision Avoidance relates to this
5 precision berthing and anything else?

6 MR. SCHODDE: Objection. Foundation. Form.

7 THE WITNESS: As I said, it's hard for me to
8 technically draw any line between those because I don't
9 see a strict demarcation point and I'm not an attorney.
10 So I couldn't tell you the scope of the patents in that
11 respect. That's outside my expertise.

12 BY MR. WISNIA:

13 Q Let's turn to your Declaration. Do you know
14 what a trip cock system is?

15 A I know a "trip stop".

16 Q You're probably using the right term and I'm
17 not.

18 A Okay.

19 Q What is a "trip stop system"?

20 A A trip stop is a way of causing a train to
21 stop if there is a hazardous situation. For example,
22 if there is a red signal and the train operator doesn't
23 stop the train, the trip stop can force the train to go
24 into emergency braking without the operator
25 intervening.



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1 Q How does that work?

2 A So I'm not an expert in these, but my
3 understanding is that you have a mechanical arm that
4 rotates alongside the track and it rotates up when you
5 want to stop the train. On the train there is an arm
6 hanging down in the proper location that if it hits
7 that arm it'll trigger the emergency brakes on the
8 train.

9 Q And do Maintenance of Way vehicles
10 historically use these trip stops or trip cock systems?

11 A Not that I know of. But I'm not -- I
12 couldn't say -- would say I don't know. I couldn't
13 really answer that authoritatively.

14 Q So again, I want to go back to when you're
15 starting a new job at Metro. It's not an industry you
16 work too much. I know you had this O'Hare project.
17 But what did you do to kind of bone up on the industry,
18 to kind of learn about this new area that you were
19 going to work in?

20 A I studied every opportunity I could.
21 Obviously, the Internet often is helpful for getting
22 some information. And there's a decent amount of
23 documentation available on the Internet. When I had
24 opportunities to meet with people in the rail industry.
25 I took advantage of that and asked numerous questions,



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1 visited a number of facilities, and talked with a lot
2 of people in various disciplines in the rail industry
3 and they gave me opportunity to get myself immersed
4 into that pretty significantly. So I just soaked up
5 everything I could find.

6 Q Okay. And is that in addition to these folks
7 at Canadian National and Illinois Transit and at BNSF?

8 MR. SCHODDE: I think you misspoke. Illinois
9 Central.

10 MR. WISNIA: Thank you. That's what I meant.

11 THE WITNESS: I mean. We've met with other
12 railroads. So I had a meeting with most of the Class 1
13 freight railroads I've met with. I met with a number
14 of transit agencies and had safety training in those
15 agencies which gets you exposed to some rules and
16 regulations, as well as some of their equipment. And
17 meeting individuals for presentations and to explore
18 opportunities.

19 BY MR. WISNIA:

20 Q So the first provisional application,
21 provisional patent application that's in the chain
22 that's related to the 131 and the 227 Patent that
23 appears to have been filed on May 19, 2011, okay?

24 A Uh-huh.

25 Q So I want to focus in on that date. First of



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1 all, do you think that you had your invention as it
2 relates to the 131 and 227 kind of developed and
3 disclosed in that provisional application in May of
4 2011?

5 MR. SCHODDE: Objection to foundation.

6 THE WITNESS: Invention is not a digital
7 thing. Today it's not invented, tomorrow it is.
8 There's a continuum of thought and development. So I'm
9 not able to delineate that historically.

10 BY MR. WISNIA:

11 Q Let me ask you a different question.

12 A It's just a whole series of -- so I can't.

13 Q It's a fair point because I didn't ask you a
14 clear enough question.

15 A Okay.

16 Q I understand that you continued to actually
17 do your work and build stuff. Okay. I'm going to
18 focus in on just the paper stuff now for a minute,
19 which is the filing of the patents?

20 A Uh-huh.

21 Q So you filed the provisional application, and
22 then it looks like there was another provisional
23 application that was filed in October, and then you
24 guys filed what became like the final application or
25 the finalized application in May of 2012?



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1 A Okay.

2 Q Do those dates make sense to you?

3 A I'll have to take your word for it.

4 Q I know you got all your exhibits there. So
5 if you want to pull out -- just pull out Exhibit 1001
6 in the 131 case. Is that the 131 Patent you got there?

7 A Yes.

8 Q Okay. So where I'm getting these dates from,
9 if you look on the left column there, there's something
10 that says "related Us Application date"?

11 A I see that.

12 Q And so under the heading "60" is where I got
13 those first two dates. Do you see that?

14 A Yes.

15 Q And then under "63" is where I got that May
16 2012 date.

17 A Yes.

18 Q So what I'm trying to determine, if you know,
19 is when did you first disclose in writing -- was it May
20 of 2011, was it October of 2011, was it May of 2012,
21 the invention that's claimed in the 131 Patent?

22 MR. SCHODDE: Objection. Foundation.

23 THE WITNESS: It's been a long time since
24 I've looked at that. So I couldn't answer that. I
25 just don't know the details of that. My focus at that



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1 time was on product development. And Rick and I worked
2 very collaboratively on that. And so he was -- one of
3 the things that was his focus at that time was
4 intellectual property. So he was more involved in that
5 than me. And I was much more involved in the final
6 real application in terms of identifying all those
7 details at that point and reviewing the application.

8 Q You mean the May 2012 application?

9 A Yeah. What you have in front of you with
10 this patent is what I'm more familiar with than the
11 prior filings.

12 Q Okay. So on this patent, you and Mr. Carlson
13 are listed as inventors and a gentleman named Mark
14 Cygnus is also listed?

15 A That's correct.

16 Q Who is Mr. Cygnus?

17 A Mr. Cygnus is a very integral part of what we
18 did at Metrom Rail. He was an individual who worked
19 for me previously that I have a great deal of esteem
20 for. And so he was also in need of work, and I was in
21 need of his services and so he began working for me.
22 And so he was very much a part of the realization of
23 the product. And he's a rather creative individual.
24 So what I can do is tell him what I need him to do, but
25 I don't tell him too much and he comes up with better



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1 than I could have asked for. And so he was also part
2 of the creative production of this system and that's
3 why he's part of the invention.

4 Q Understood. I don't know if you've ever
5 heard this famous story about Edison when he created
6 the light bulb, he made a picture and he left it in the
7 lab and he said to the guy, "Build this". Do you know
8 the story?

9 A I don't think I have heard that.

10 Q Okay. All right. Is Mr. Cygnus still an
11 employee with Metrom?

12 A He's not.

13 Q Was he an employee at some point or was he a
14 consultant?

15 A He was an employee.

16 Q All right. If you know, where is Mr. Cygnus
17 now?

18 A He is a freelance development contractor. I
19 still use his services periodically. I talk to him at
20 least monthly.

21 Q Okay.

22 THE COURT REPORTER: Can you spell his name?

23 MR. WISNIA: It's C-Y-G-N-U-S.

24 THE WITNESS: Marc is M-A-R-C.

25



1 BY MR. WISNIA:

2 Q All right. If you grab one of the other
3 notebooks there, I want to take a look at the other
4 1001 which is the 227 Patent.

5 A I'm not finding -- what exhibit is that?

6 Q They have the same number. It's 1001.

7 A Or 2000. I see. I realized I got the wrong
8 one then.

9 MR. SCHODDE: I think he may only have one
10 set of the exhibits because --

11 Q Sure. They're almost all overlap except for
12 these, except for this one.

13 MR. SCHODDE: That one.

14 MR. WISNIA: Would you mind asking somebody
15 to print that out?

16 MR. SCHODDE: Sure.

17 BY MR. WISNIA:

18 Q We'll come back to that. Let's turn back to
19 your Declaration which is Exhibit 2019. By the way,
20 you had mentioned earlier that you guys had done some
21 medical development stuff at one of the Metrom entities
22 because you and another colleague had a lot of
23 experience in it. Was that Mr. Cygnus you were
24 referring to?

25 A No. Different individual.



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1 Q Was Mr. Cygnus an employee at Bit 7?

2 A Yes. Actually, I think he was a contractor
3 for Bit 7. I'm not sure if he was ever an employee of
4 Bit 7. I can't recall with certainty. He was a former
5 client that became a contractor for us.

6 Q I had asked you earlier about, you know,
7 certain technologies you worked with in these previous
8 companies. I forgot to ask you, did you work with GPS
9 in any of these previous companies?

10 A I don't believe so.

11 Q Have you ever looked or developed any
12 technology for Collision Avoidance for industries
13 outside of the railway industry?

14 A No.

15 Q Have you looked at, for example, expanding
16 the AURA system to cars or trucks or things of that
17 nature?

18 A There has been some consideration of that. I
19 don't believe I have been involved in anything
20 substantive at least in that.

21 Q Understood. And when you were kind of doing
22 your studying of industry and things of that nature,
23 did you look at how Collision Avoidance was done in
24 areas outside of railway?

25 A I don't recall if I did.



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1 Q Okay. Because some of the problems you're
2 mentioning, right, of human error and limited sight
3 lines, I mean I could see that being an issue in
4 warehouses, for example, I could see that being an
5 issue, in various trucking applications.

6 MR. SCHODDE: Objection to form.

7 MR. WISNIA: I didn't get to the question
8 part yet.

9 MR. SCHODDE: Okay. I just thought you were
10 done.

11 BY MR. WISNIA:

12 Q No question. Is that right?

13 A I suppose, yeah. Each industry has its own
14 issues that you have to deal with.

15 Q Did you look into those issues at all? Maybe
16 using it in trucking or in other sort of heavy
17 equipment?

18 A I have no recollection. I may have. I don't
19 know. I can't recall anything. I was laser focused on
20 the rail industry and that's the only recollection I
21 have at this point.

22 Q Okay. Did you guys build an Ultra-wideband
23 transmitter from scratch or did you guys use one off
24 the shelf?

25 A I initially thought I might be doing that.



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1 But I quickly discovered that literature that suggests
2 simplicity is clearly not written by anyone who
3 actually has done it. So it turned out to be more
4 complex of a challenge. And I didn't have time to do
5 that on my project timeline. And so went in search of
6 someone who'd already taken care of that for me.

7 Q And who was that?

8 A That was Time Domain Corporation.

9 Q And what did Time Domain Corporation do?

10 A T-I-M-E D-O-M-A-I-N. Time Domain is a
11 pioneer in Ultra-wideband. And fortunately for me,
12 they had just recently come out with a new version of
13 their Ultra-wideband Ranging System.

14 Q What was that called, if you remember?

15 A If you remember, it was the P400. P400.
16 They had earlier versions, but technology had not
17 advanced to the point that it was, what you would call
18 cost effective. So if I had tried to do this a year
19 earlier, maybe even 8, 9 months earlier, I don't think
20 it would have happened because it would have been too
21 cost prohibitive.

22 Q All right. And so what was the P400 system
23 like? What were the components of it?

24 A A P400 was an Ultra-wideband ranging radio.
25 Basically it was a single board assembly that had



1 Ultra-wideband transmitter receiver and processing
2 necessary to perform ranging operations.

3 Q And when we're saying "ranging operations",
4 that's the idea of figuring out the relative distance
5 between one object and another object, right?

6 A Correct. Using essentially a two-way time of
7 flight. Two-way time of flight measurement means.

8 Q And my understanding is radar operates in
9 kind of that same way, is that right?

10 A There's some similarities, but there are some
11 differences that can be rather stark. You'll find in
12 the application, I think, or the patent, a mention of
13 radar as well as the time of flight ranging. But there
14 are differences between them and some significant trade
15 offs.

16 Q Understood. And what was Time Domain selling
17 that P400 for? What sort of ranging applications were
18 they aiming at?

19 A I don't know what all they were pursuing at
20 that point. They didn't share that necessarily with
21 me. The only thing I was aware of was they were doing
22 some work with military applications because that they
23 were able to talk about. The other ones perhaps they
24 weren't willing to talk about.

25 Q Okay, like how were they using it in the



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1 military applications, if you recall?

2 A I believe they told me about the vehicle
3 convoy application.

4 Q And what would that be? Would that be like a
5 long line of tanks or trucks or something going
6 somewhere?

7 A Apparently.

8 Q And so you have these big heavy equipment
9 kind of going down a way and did they have an issue of
10 each of them bumping into the other or something?

11 A I don't know. I wasn't involved in that at
12 all.

13 Q Okay. How did you come to find the Time
14 Domain company in this product?

15 A They had a press release touting their P400.
16 And it was actually a second press release, I think,
17 that they had on the P400 I found out later that had
18 just come out within weeks prior, probably to when I
19 was looking for an off the shelf, more off the shelf
20 solution for Ultra-wideband.

21 Q Got it. When did you find it, this press
22 release?

23 A I would have to make an educated guess. Is
24 that acceptable to make an educated guess on this?

25 Q If you tell me it is. If you tell me it's an



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1 educated guess, then we'll take you at your word.

2 A My educated guess is in the fall of 2011, but
3 I would not be able to stand up to scrutiny on that if
4 I'm wrong.

5 Q Okay.

6 A It's a guess.

7 Q And so you saw the press release. What did
8 you do?

9 A Called them.

10 Q All right. And did you go out there and
11 visit them?

12 A Yes. Post haste.

13 Q Where were they or -- where were they?

14 A Huntsville, Alabama.

15 Q All right. And who did you meet with in
16 Huntsville, if you recall?

17 A Rachel Reinhardt another individual whose
18 name is just escaping me. That's the only two. Oh,
19 and then the individual who handled their sales
20 activity. Jon, as in J-O-N. And his last name is not
21 coming to me at the moment. That's the three
22 individuals I remember meeting.

23 Q I'm not sure I heard the third one. So I
24 heard -- you mentioned Jon and then Rachel.

25 A Rachel. And a third person. I cannot



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1 remember his name, but he showed up in a number of
2 pieces of literature that Time Domain published. That
3 unfortunately escapes me at the moment.

4 Q Did you meet Mark Roberts?

5 A That name isn't familiar to me.

6 Q How about William or Bill Grisham?

7 A No.

8 Q How many folks -- how big of an operation was
9 Time Domain when you went out there?

10 A It was a little unclear because there is
11 actually more than one company under the same roof.
12 There's at least two companies there, both
13 Ultra-wideband, but in different markets.

14 Q Okay.

15 A I would guess at the time there was 30 or so
16 people there.

17 Q You said both Ultra-wideband, but different
18 markets. So what were the two different markets, if
19 you recall?

20 A There are two major branches of
21 Ultra-wideband. Impulse, which is used for ranging and
22 data communications which is obviously used for sending
23 data. And they are very different from each other in
24 terms of how to use Ultra-wideband.

25 Q And fair to say that the Aura system and the



1 work that you guys did at Metrom was for ranging with
2 UWB, right?

3 A Yeah. Impulse. Ultra-wideband. Yeah.

4 Q And not for communications?

5 A Correct. Not for communications in the sense
6 of sending large quantities of data. You can still
7 send some communication data using impulse, just not
8 large quantities.

9 Q Okay. Was Ms. Reinhardt or Jon were they
10 technical people?

11 A Ms. Reinhardt was the President, but she is
12 pretty technical. She actually was instrumental in
13 getting the FCC to allow Ultra-wideband by regulation.
14 Jon, I didn't think was very technical, but subsequent
15 dealings with him, he's pretty experienced and
16 knowledgeable. He just doesn't show it all the time.
17 He plays the salesman role and he defers to the other
18 guys, but my respect for him has grown over the years.

19 Q And the third individual?

20 A The third individual was like their Chief
21 Technologist.

22 Q All right.

23 A And that's why I was talking to him. So he,
24 I think, was probably their go to guy to talk with
25 people with prospective applications to help them learn



1 how to apply their radios for that application.

2 Q And I mean, working with Time Domain, is that
3 your first kind of hands on experience with UWB?

4 A Yes.

5 Q You went out there. Let me ask you, how long
6 were you out there for?

7 A It may have been a two-day visit. I'm not
8 sure. It was at least a solid one-day visit.

9 Q And did you go solo or did somebody come with
10 you?

11 A Rick Carlson was there with me. I don't
12 recall anyone else that could have been, but I don't
13 recall anyone else. But Rick and I were very
14 frequently working in close collaboration on these
15 types of things.

16 Q Understood. So I assume you told them that
17 you're thinking about using this in the railroad
18 industry?

19 A Uh-huh.

20 Q What were their thoughts on that?

21 A I don't recall exactly. It's all a blur.
22 They provided technical guidance in terms of what the
23 radios were capable of doing and how to best take
24 advantage of that. But I couldn't tell you any more
25 detail at this point because unfortunately, I've kind



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1 of adopted a lot of that knowledge, and I can't tell
2 you the genesis of where it came from.

3 Q Understood. I mean, did they mention to you
4 that other folks or that they had worked in using UWB
5 in the railway industry?

6 A They did not. The only mention I recall was
7 military. They'd done some military research or
8 demonstration or something like that.

9 Q Okay. So did they show you -- let me ask
10 you. Aside from having meetings in a conference room
11 like we're in now, what else did you see when you were
12 out there?

13 A They did a demonstration, a tabletop
14 demonstration of their Ultra-wideband system. And I'm
15 sure I went and saw their lab because that's a must for
16 me. And so I saw some of the equipment they had there
17 for testing and calibrating radios and evaluating
18 things like that.

19 Q Okay.

20 A We may have done something outside, too, but
21 I don't recall that with any certainty.

22 Q And so when you do this ranging stuff. You
23 need at least two of these units, right?

24 A That's correct.

25 Q So you need one on. We'll make it a simple



1 case if you want to get the range between Object A and
2 Object B. Object A needs to have some sort of module,
3 and then Object B has to have some module, right?

4 A Correct. Unless you're using radar. And I
5 think they had demonstrated the Ultra-wideband radar
6 capability then, too. I think it was that visit. If
7 not, it was a subsequent one.

8 Q But they showed you one where they had a unit
9 on one object and a different unit on a different
10 object?

11 A That's correct.

12 Q What kind of objects were they?

13 A It may have been just boards on standoffs so
14 you could see everything.

15 Q Okay.

16 A I don't recall details.

17 Q So in these situations, the object, A module
18 does some sort of -- sends out some signal to the
19 Object B. It gets a bounce back. And doing this time
20 of flight calculation, it figures out the relative
21 distance between A and B, right?

22 A Yes.

23 Q How is that, in this demonstration you saw,
24 how was that presented to the user? What I mean is,
25 how is that data presented to the user?



1 A They have -- so in their demonstration --

2 Q Yes.

3 A -- of what they did? They had a laptop that
4 they connected via USB cable to their board. So you
5 had one board sitting solo, just power, another board
6 with USB cable power, as well as USB cable to a laptop.
7 And they have a development tool that allows you to see
8 live ranging results. And so you basically have a
9 number that's showing you constantly the updates.

10 Q Okay. And so you see some sort of distance.
11 And I assume in the demonstration, they take the other
12 object and they move it back and forth and you say,
13 "Look, it changes"?

14 A Yeah. Walk out of the room, maybe, and show
15 you if it would go through walls or things like that,
16 perhaps.

17 Q All right. Did they have some sort of system
18 or some sort of software that allowed you to set, let's
19 say alarms if things got too close or far away from
20 each other?

21 A No.

22 Q Is that something that they understood that
23 people would use their device with?

24 MR. SCHODDE: Objection to foundation and
25 form.



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1 THE WITNESS: I have no idea.

2 BY MR. WISNIA:

3 Q Okay. All right. Aside from that one time
4 that we're talking about you going out there and visit
5 them, did you ever go out and see them again?

6 A Yes.

7 Q How many times?

8 A More than three. I couldn't tell you the
9 number, but I got to know them pretty well.

10 Q All right. And did you get to meet any other
11 folks in any of the later meetings?

12 A I met an individual named Alan Petroff, who
13 ended up being my prime. Petroff, P-E-T-R-O-F-F.
14 Alan, A-L-A-N. He ended up becoming a prime contact
15 for me. Alan was a longtime employee apparently of
16 Time Domain and had witnessed the rise and the fall and
17 the rise and the fall and then the rise again of
18 Ultra-wideband apparently.

19 Q And was he a technical person or a
20 salesperson or what was his role?

21 A He was a technical person.

22 Q And was he -- what sort of help -- let me
23 strike that and ask a new question.

24 What sort of help, if any, did the folks
25 at Time Domain give you in addressing the problems of



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1 ranging as they would be specific to the railway, if
2 any?

3 A I don't know if there was anything specific
4 to railway. It was just a matter of -- Alan was very
5 good at being very frank about what Ultra-wideband
6 ranging can do and what it can't do as opposed to
7 someone giving you a sales spiel that makes it sound
8 like you can do anything with it. He was very good
9 with helping me understand limitations.

10 Q Did you have to make any sort of adjustments
11 or changes to the Time Domain P400 for it to work for
12 your purposes?

13 A Yes.

14 Q What did you need to do?

15 A The P400 was not really industrial ready. So
16 they created a special version of the P400 for our
17 purposes, which they called the P412.

18 Q And what was different between the 412 and
19 the 400?

20 A It was more robust thermally. It didn't need
21 active cooling. I believe its power supply was more
22 tolerant of an industrial environment. And what I mean
23 by "more tolerant", wider voltage range, better
24 transient handling or noise handling, electrical noise.
25 It might have been some differences in packaging and



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1 IO. That's all I can remember at the moment. Again,
2 that's quite some time ago.

3 Q Okay. And they made that P412 to your specs,
4 or you told them the problem and they said, okay, we'll
5 make you a version that could work in a hotter, dirtier
6 environment?

7 A It was a cooperative specification process,
8 but essentially we created specifications for it in
9 collaboration with them. It wasn't just done in a
10 vacuum.

11 Q Okay. And is that what you still use? Do
12 you still use the P412?

13 A No. Then they came out with another version,
14 which they worked with us to make sure that it was
15 customized for our needs and that became the P440.

16 Q Okay. That's what you all use today?

17 A Yes.

18 Q All right. I want you to take a look at Page
19 6 of your Declaration.

20 A I am there.

21 Q All right. So above Paragraph 18, you have
22 some pictures. Where do these pictures come from?

23 A These are photographs that I took on field
24 visits with Maintenance of Way gangs.

25 Q Okay. Is this a field visit with CN or



1 someplace else?

2 A It's more than one entity.

3 Q So going clockwise starting at the top.

4 A Top is a rail grinder, G-R-I-N-D-E-R.

5 MR. SCHODDE: Okay. Are we top left?

6 MR. WISNIA: Yes, please. Top left.

7 THE WITNESS: The name of the company. It's
8 right there. Loram, L-O-R-A-M.

9 BY MR. WISNIA:

10 Q Okay.

11 A Top right. That is called a Tripp.

12 T-R-I-P-P. And that is probably Union Pacific.

13 Q All right. Bottom right?

14 A Bottom right. That looks something like a
15 spiker or something similar to that. But I think
16 that's a spiker, a rail spiker. And that looks like
17 Canadian -- could be Canadian Pacific. I cannot tell
18 for sure. And then bottom left, that is Canadian
19 National. That's a Mark IV tamper, T-A-M-P-E-R. Mark
20 IV, as in Roman numerals, M-A-R-K-I-V.

21 Q All right. And these are just examples of
22 Maintenance of Way devices, right?

23 A Yes.

24 Q There are other ones?

25 A Yes. There are a number of different types



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1 of pieces of rail maintenance equipment.

2 Q Okay. And are there certain Maintenance of
3 Way vehicles that can be driven on the road and on the
4 rail?

5 A Yes. High rail vehicles.

6 Q They're called what?

7 A Hi-Rail, H-I-R-A-I-L. Sometimes people spell
8 it differently. H-Y sometimes R-A-I-L. It might be a
9 trademark.

10 Q And those kind of look like what, like pickup
11 trucks?

12 A Generally looks like a pickup truck with some
13 additional apparatus mounted on the front and the rear
14 so that you've got rail wheels in addition to the
15 rubber wheels.

16 Q Okay. All right. If you turn to your next
17 page, this is Paragraph 19. You say "In 2011, we were
18 aware of no reliable and accurate mechanism for
19 collision avoidance between MOW vehicles, all caps
20 operating on railroad tracks." You see that?

21 A Uh-huh. Yes, I do.

22 Q All right. Who did you mean by "we"?

23 A I was talking collectively "we", as in those
24 of us at Metrom Rail.

25 Q So that would be you and pretty much



1 everybody in the company?

2 A Yeah, pretty much everyone. I mean I'm
3 speaking probably more corporately in terms of people
4 in leadership positions who were interacting with
5 customers and had found that there was a need for
6 something expressed by several railroads, but anything
7 they had tried had apparently failed to meet their
8 needs.

9 Q Do you know what people had tried in the
10 past?

11 A I don't have explicit direct knowledge of
12 that. So I could only speculate.

13 Q And in 2011, had you done like a search of
14 the field to see who's out there, who are the
15 competitors, what are people making, how are people
16 trying to address this problem?

17 A This may be shocking to you, but I didn't
18 concern myself with that. I just concerned myself with
19 just the solution. And clearly what was out there
20 wasn't working. So I just thought about what was
21 needed for the application.

22 Q Okay. So people go about things in different
23 ways. I mean I get it. Some people say I just want to
24 think what I think is best and I'll just go ahead and
25 put my head down and work on it, which I think is what



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1 you're telling me you did. And then there's other
2 people that say, okay, let me see what everybody else
3 has tried to do, and make sure that -- figure out where
4 they succeeded, where they failed, and kind of build a
5 path for myself from that. Do you fall into one of
6 those camps or the other?

7 A You couldn't categorize me in either camp
8 because it depends on the circumstances.

9 Q I mean specifically for this work?

10 A In this particular situation, I didn't
11 concern myself with looking at what other people had
12 done. I just knew from conversations with that first
13 individual at CN or Illinois Central that what they had
14 seen was not satisfactory.

15 Q But you don't know what, in fact, they had
16 seen?

17 A Not that I would be willing to testify
18 because I don't know for certain. I would be totally
19 speculating based on some possibly even secondhand
20 speculation or knowledge.

21 Q Okay. All right. And the second sentence of
22 Paragraph 19 says, "The existing method used to avoid
23 MOW collisions was visual separation based on operating
24 rules, which is the approach historically used prior to
25 our invention." Do you see that?



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1 A Yes.

2 Q And you mentioned that earlier, I think, when
3 we're talking about that they had these rules when
4 you're going --

5 A Correct.

6 Q -- when you're in travel mode or work mode,
7 you'd have certain separation distances and these were
8 the written and unwritten rules you're talking about?

9 A Yes.

10 Q Okay. All right. Paragraph 20, you write,
11 "To address this void upon my hire by Metrom in 2011, I
12 was test with the design and development of a Collision
13 Avoidance System, CAS, all caps, for MOW vehicles."

14 A Correct.

15 Q When you were hired in 2011, you had no
16 experience in that area?

17 A That is correct.

18 Q Paragraph 21 says, "I, along with other
19 engineers, developed what would be called the Aura,
20 A-U-R-A, all caps, Collision Avoidance System or simply
21 the AURA CAS." See that?

22 A Yes.

23 Q Who are the other engineers that you're
24 referring to?

25 A Cygnus is one of them, obviously. He goes by



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1 his last name basically.

2 Q Okay.

3 A You want me to tell you all the names of all
4 the development staff?

5 Q Before you do it? I mean, how many people
6 are we talking about, roughly?

7 A There was at least five other technical staff
8 that collaborated on the development of this system, on
9 the implementation of the system.

10 Q Give me the names to the extent you can?

11 A Maybe six, actually. So Rick Carlson was
12 definitely involved in this process. As I said before,
13 Cygnus. A guy named John DeVos, J-O-H-N D-E-V-O-S, a
14 guy named John Plutt, J-O-H-N P-L-U-T-T. A guy named
15 Rick Moeller, R-I-C-K M-O-E-L-L-E-R, a guy named Robert
16 R-O-B-E-R-T, Lagowski, L-A-G-O-W-S-K-I. I also had a
17 couple of contract people that I used, and I can't
18 think of their names at the moment for various things.
19 One of them was an RF engineer. Capital R, Capital F.
20 And I apologize to anyone that I forgot and didn't
21 mention here, won't be offended.

22 Q All right. By the way, do you pronounce CAS,
23 do you say CAS or do you say C-A-S?

24 A C-A-S.

25 Q So in Paragraph 22, you say, "The AURA CAS



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1 used Ultra-wideband, UWB, radio technology to provide
2 an accurate time of flight ranging system. And that's
3 the UWB technology you got from Time Domain." Correct?

4 A That is correct.

5 Q In the next sentence you say, "The system
6 offered the flexibility of operator defined detection
7 and alarm criteria with integrated expandable hardware
8 options and the ability to function in all environments
9 and terrain even tunnels." Do you see that?

10 A Uh-huh.

11 Q Let me break that down a little bit.

12 A Yes, I see that.

13 Q What did you mean by "operator defined
14 detection"?

15 A By "operator" what I mean there is the
16 railroad operator defined that. So each railroad can
17 customize the limits, speed, what constitutes a work
18 mode or travel mode, what constitutes an alert. We
19 actually have two levels of alerts, and then we have an
20 alarm condition. And there's various other factors
21 that also can be manipulated by the railroad operator
22 for their liking.

23 Q All right.

24 A Not the driver of the vehicle, because the
25 driver is just subject to whatever the operating rules



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1 that the railroad has defined.

2 Q Okay. So like, for example, you were kind
3 of -- just be a way to incorporate these rules that the
4 guy from CN had told you about earlier. In other
5 words, when you're in a work mode, I don't want you
6 going faster than ten miles. I don't want you -- let
7 me strike that answer again.

8 In other words, if you're in a work
9 mode, that means you have to have a spacing of "x" and
10 you can't go faster than "y". And if you're in a
11 travel mode, then you have to have a spacing of x' and
12 you can't go faster than y'?

13 A Yes, but we didn't actually do anything to
14 limit the speed. It's just whatever speed they're
15 going, we determined what mode they would be in.

16 Q Okay.

17 A And if they chose to speed, none of the
18 railroads asked us to prevent them from over speeding.
19 It was sometimes discussed, but there may be reasons
20 why they didn't want to do that.

21 Q Okay. And so the detection and alarm
22 criteria basically says that, look, if you're violating
23 this rule, in other words, you're going at a certain
24 speed, but you're too close, we're going to throw off
25 an alarm, is that right?



1 A That's correct. First we'll alert you at a
2 greater distance so you have the knowledge that you're
3 getting into proximity of another vehicle, and if you
4 continue closing and violate the rule, then you get an
5 alarm condition.

6 MR. SCHODDE: Howard, when my secretary stuck
7 her head in, that was to tell us lunch was ready and
8 it's been about an hour. Are you at a good spot for a
9 break?

10 MR. WISNIA: Just give me two minutes and
11 we'll take a break.

12 BY MR. WISNIA:

13 Q All right. So just to finish up on this
14 point, do you have one of these cars with a backup
15 camera?

16 A Yes, I do.

17 Q All right. So, you know, when you back up in
18 the car, first it kind of gives you a light beep and
19 then as you're getting closer to closer to maybe
20 hitting something, it beeps louder and louder. You
21 follow what I'm saying?

22 A Yes. Actually, my car doesn't do any
23 beeping. Mine just gives you a visual. But I think
24 I've seen people have the audio as well.

25 Q And even in the visual one, right, it gives



1 you, like a green and then goes yellow and then it goes
2 red?

3 A Yeah.

4 Q That's kind of the idea we're talking about
5 which is if you're coming up on a collision, potential
6 collision, and then if you get even closer, you go from
7 an alert to an alarm. Is that what we're saying?

8 A It's a graduated alarm or alert type system.
9 Obviously, we're dealing at much greater ranges than
10 the radar that's used for backing up.

11 MR. WISNIA: Okay. All right. Why don't we
12 take a break?

13 THE VIDEOGRAPHER: Going off the record at
14 12:33 p.m.?

15 (LUNCH RECESS)

16 THE VIDEOGRAPHER: Going on the record at
17 01:22 p.m.

18 BY MR. WISNIA:

19 Q Sir, you understand you're still under oath?

20 A Yes, I do.

21 Q All right. Before the break, we were talking
22 about various meetings that you had had. So I know you
23 met with Canadian National and you met with BNSF. Who
24 else in the railway industry did you meet and present
25 your system to? I'm talking about Collision Avoidance.



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1 A Yeah. And Freight Rail you're talking about?

2 Q Let's start there. Sure.

3 A Union Pacific, I think you said BNSF, CNCP,
4 Union Pacific, Norfolk Southern. I can't recall if I
5 met with them or I just did something field wise with
6 them. Am I missing someone? I think that's people I
7 met with in the Freight Rail run, Class 1 Freight Rail

8 Q So that's four of them?

9 A Right.

10 Q So you got BNSF --

11 A Seems like there was more. It seems like
12 there's five, but go ahead, please.

13 Q I have BNSF. I have CN. I have UP and I
14 have Norfolk Southern.

15 A Southern. And CP, Canadian Pacific.

16 Q All right. Which of those entities ended up
17 buying any product from you guys?

18 A I think Burlington Northern is the only one
19 that didn't.

20 Q Okay. So the other four, did they all buy
21 the Collision Avoidance System?

22 A Yes.

23 Q Okay. And did they all buy it for
24 Maintenance of Way?

25 A I believe so.



1 Q All right. And what year did Union Pacific
2 first start ordering from you guys?

3 A It's a blur. Can't remember when that was.
4 It was later than CN and CP. I can't remember the
5 year.

6 Q Okay. Can you give us a range? For example,
7 was it before or after 2020, if you know?

8 A That was before.

9 Q Okay. Are you able to close it in any better
10 than that or not really?

11 A I'm not.

12 Q Okay. And what about CP?

13 A Somewhere between 2013 and 2015 probably. I
14 can't recall.

15 Q And what about Norfolk Southern?

16 A I'm real hazy on that because that one was
17 strictly a field interaction that I had. So I've had a
18 lot of field interactions and so they all blur into
19 obscurity.

20 Q What is a "field interaction"?

21 A Where I actually went out to where -- seeing
22 our product in the field or helping with installations
23 in the field or demonstrations in the field all were --
24 I didn't go to an office. I went to an actual work
25 location.



1 Q Okay. All right. So of these four entities,
2 are they all still customers?

3 A As far as I know, yes.

4 Q Now I asked you and you limited your answer
5 to freight vehicles. I think that's how you said it.

6 A Yes.

7 Q What other areas have you guys sold the
8 Collision Avoidance System to?

9 A So I separated off, for example, contractors
10 to the Freight Rail company because they're not
11 actually Freight Rail operators. They're contractors
12 to them.

13 Q Okay.

14 A So there's several of those that I may not be
15 able to recall the name, but Loram was one of those.

16 Q And is Loram a customer?

17 A Yes, they are a customer.

18 Q Okay.

19 A There's several contractor companies that I
20 don't know their names. I don't deal with them
21 directly. So I'm struggling to even remember one of
22 the other names.

23 Q Okay. Any other areas that we haven't talked
24 about?

25 A Amtrak.



1 Q Okay. Is Amtrak a customer?

2 A Not currently. They've purchased stuff from
3 us before, but I don't know of any recent activity.

4 Q I think earlier you talked about -- if you
5 are still thinking, I didn't want to stop you.

6 A Go ahead.

7 Q All right. Earlier you mentioned "transit"
8 as a field?

9 A Yes.

10 Q Okay. Do you have any customers in transit
11 specific to this Collision Avoidance stuff?

12 A Not that I can think of, but I wasn't always
13 privy to anything in that arena.

14 Q All right. Have you made presentations or
15 are you aware of you guys presenting the Collision
16 Avoidance System to various customers that didn't
17 purchase it? Obviously BNSF is one. Anyone else?

18 A I suspect that we made it part of our
19 presentation to anyone who is in the rapid transit
20 arena as well, because they usually have maintenance
21 equipment. I'm just a little foggy on if anything
22 happened with those. But there's a handful of rapid
23 transit customers that we did present to.

24 Q Who did not purchase from you? Is that
25 right? You got to say that loud.



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1 A Yes, I believe who did not purchase.

2 Q Okay. All right. So you know that this
3 lawsuit started originally about some contract related
4 to New York or do you know that?

5 A I thought it was broader than that.

6 Q I don't mean to limit it. I'm just saying
7 the Complaint in this case talks about a particular
8 contract with New York. I mean, are you aware of that?

9 A Yeah. I'm aware of that contract, but I
10 thought it was broader than that. I thought it was --
11 the genesis of this was actually patent infringement.
12 That I guess in terms of deployment it would have been
13 New York, I guess. But I guess the reason why I'm kind
14 of confused by your question is because it wasn't just
15 a particular customer per se. It was an infringement
16 in a broader sense I would have thought of.

17 Q Okay. Were you part of any presentation of
18 the AURA System to New Yorker Mass Transit?

19 A Yes.

20 Q Okay. Did you guys win that contract?

21 A What are you referring to as "that contract"?

22 Q Well, is New Yorker or authority or mass
23 transit a customer of you guys?

24 A We did business with New York City Transit.

25 Q In the past?



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1 A In the past.

2 Q Are they a current customer?

3 A Not currently, no.

4 Q Okay. You did a proof of concept for them?
5 Is that what you mean?

6 A We did a proof of concept? We did actually
7 multiple proof of concepts with New York City Transit.

8 Q Specific to Collision Avoidance.

9 A Collision avoidance and train control. But
10 train control, part of train control is essentially
11 Collision Avoidance.

12 Q So I want to focus now on you mentioned, for
13 example, that BNSF, when you presented particular
14 individual you presented to, wasn't all that
15 enthusiastic?

16 A The individual that we initially worked with
17 was rather enthusiastic. His boss was not very
18 friendly to technology.

19 Q As far as you know, did they go with a
20 different solution?

21 A I don't know. I'm doubtful.

22 Q Okay. Do you know for any of the customers
23 that you've made presentations to that didn't hire you
24 if they've gone with different solutions?

25 A Could you repeat the question, please?



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1 Q Sure. I'm asking now -- you've answered now
2 for BNSF and talking about some of these other ones.
3 So the question now is for any of the customers that
4 you presented to, but didn't actually get hired or
5 stopped working with you, do you know if they went with
6 a different supplier or some other sort of solution?

7 A So we did make a presentation with Amtrak and
8 we did sell some systems to them that were installed on
9 certain equipment. And my understanding at this point
10 now is that Piper has installed on at least the East
11 Coast corridor a number of Collision Avoidance Systems.
12 In fact, at the Next-Gen conference that I attended
13 last month, Robert Hanczor, I believe is his name, how
14 you pronounce it, said that they had about 500
15 installed, I think, on that corridor and expected to
16 have 1000 installed by the end of the year. So I would
17 say that would be a yes to your question, if I'm
18 understanding it properly.

19 Q Okay. So, Mr. Hanczor, by the way.

20 A Hanczor? So it's a completely different
21 pronunciation. I'm sorry.

22 Q It's an unusual spelling. So that's for
23 Amtrak. Any other customers where you've presented and
24 you did not get the work or they stopped working with
25 you and they went with a different solution as far as



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1 you know?

2 MR. SCHODDE: Objection to foundation.

3 THE WITNESS: I don't know, but I wouldn't
4 necessarily be privy to that. I'm only involved in a
5 certain portion of the process.

6 BY MR. WISNIA:

7 Q Okay. All Right. We talked a little bit
8 about Mark Cygnus or Cygnus --

9 A Cygnus.

10 Q -- Cygnus before. And when did he leave the
11 company?

12 A We had a layoff.

13 Q Okay. But I think you mentioned earlier that
14 you still used him on a contract basis?

15 A Yes. I use him on a contract basis
16 periodically as well as he has a great deal of history.
17 So sometimes he provides me with information that I
18 need to understand something.

19 Q I want to go back now to 2011/2012 time
20 frame. We were talking about proof of concept that you
21 guys were working on, and I assume eventually you had a
22 more commercial prototype at some point. I just want
23 to kind of drill down on that a little bit. So when do
24 you think you had your first proof of concept as it
25 related to the Collision Avoidance System?



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1 A First quarter of 2012, 2012.

2 Q Okay. And when did you have your first
3 prototype?

4 A By "prototype" you mean a production
5 representative product version?

6 Q Well, I want to make sure I understand how
7 you think about these things. So I think based on what
8 you said earlier, and you tell me if I'm wrong, because
9 really I just want to adopt the way you think about
10 this, is you did some sort of proof of concept. Then
11 you made like a one off prototype or a couple of
12 prototypes for how it actually would be deployed. And
13 then when you got it finished, then you went to a
14 production model, is that right?

15 A Actually, no. One would think that. You
16 have to understand that I came from a background of
17 rapid product development. And on numerous occasions,
18 my first prototype actually went into production.

19 Q Okay.

20 A And that came from years of experience with
21 product development, and I've been able to have a
22 pretty good success rate of not having to have multiple
23 iterations.

24 Q Okay.

25 A And so that was part of probably the



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1 attraction of hiring me. And so I didn't have really a
2 prototype phase to go through with the Collision
3 Avoidance System. We did a proof of concept, and that
4 was sufficient to get enough confidence that the first
5 prototypes we built was the first production build.

6 Q Okay.

7 A Which was installed on customer machines and
8 went into service.

9 Q All right. So that first production was
10 when?

11 A When you say "when", you mean started or
12 rolling off the line?

13 Q Let's start with when it was actually
14 delivered to the customer and put on the equipment.

15 A Delivered to the customer, December of --
16 December of 2012, I believe. I'm feeling a little bit
17 nervous that I might have something off, because I
18 can't check anything, but I believe it was December of
19 2012.

20 Q Okay. I mean if you're off, are you off by a
21 matter of months or are you worried that you're --

22 A It was December. It's the year, but it's
23 2012. I'm almost positive it is. But I'm feeling a
24 little nervous because I don't index these dates in my
25 brain, because I'm always in the present and not



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1 dwelling what I did a decade or more ago.

2 Q Okay. So it sounds like you finished this
3 proof of concept sometime Q1 of 2012. And then later
4 that year towards the end of that year, you went into
5 actual production?

6 A Yes.

7 Q And so at what point -- I assume you went
8 right from your proof of concept right into your
9 production build, is that right?

10 A We did our design, built a number of units
11 and installed them on actual customer machines.

12 Q Okay. And the one that you actually
13 deployed, what were the components?

14 A So the three major components was what we
15 called the "TSM", which stands for Transponder Sensor
16 Module, although sometimes maybe the marketing
17 literature, the marketing guy might have said it was
18 something else, but TSM. And that was essentially the
19 radio portion of the device where the ranging
20 communication happened in an RF or radio sense. And
21 then there was the CEM. We called it the Control
22 Electronics Module, which was the brains of the unit,
23 where the power supply was and the IO, the interface
24 with the devices. And then there was a user interface.
25 And the user interface was mounted within view in reach



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1 of the operator of the machine.

2 Q Okay. And so the TSM module, is that
3 basically the product you got from Time Domain?

4 A It uses the product we got from Time Domain,
5 but there's also our own board in there as well.

6 Q And what does your additional board do?

7 A Our additional board provides a GPS receiver
8 and it provides power conditioning, some power holdup,
9 interfacing, translating the Ultra-wideband radio data
10 communication into a more robust interface to travel
11 some distance, because in some cases, the TSM could be
12 a considerable distance away from the CEM.

13 Q You're talking on the DMOD side?

14 A I'm talking about the board that's in --

15 Q Yeah, but I'm saying -- I think what you're
16 telling me is you're not talking about on the transmit
17 side. You're talking --

18 A On the cabling interface.

19 Q That's internal to whatever that system is?

20 A And then goes -- connects to the CEM
21 interfaces to the CEM.

22 Q All right.

23 A Depending on which version it is, in some
24 cases the A data communications radio is part of that
25 external assembly. In some cases it's not. It depends



1 on which version of packaging.

2 Q Okay. So you have your own board and it's
3 got a GPS receiver on it, correct?

4 A Yes.

5 Q I assume that's an off the shelf component
6 you buy?

7 A It is a commercially available device.

8 Q I didn't catch all of it, but it sounds like
9 you have some sort of power conditioning. Just repeat
10 what you said about that.

11 A There's power conditioning. There's like
12 hold up so that if there's a brief power interruption
13 you don't interrupt operations.

14 Q Like a run capacitor?

15 A Essentially, it's a capacitor to hold the
16 energy so that a brief interruption won't disrupt
17 normal operation.

18 Q Okay. All right. Anything else?

19 A There's actually power converters on that
20 board to change the -- because the vehicle power is
21 sent up there and we step it down to filter condition
22 it for the various uses in the TSM.

23 Q Okay. All right. And then you said, explain
24 to me now what you do to basically -- it sounds like
25 you're doing some sort of boosting of the signal as it



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1 goes from the TSM to the CME. Is that what you're
2 talking about?

3 A Actually -- so the Time Domain Ultra-wideband
4 transceiver, the interface that we use to it, the
5 interfaces they provided originally didn't have enough
6 industrial robustness for our liking. So we do a local
7 translation of those signals into a more robust wired
8 interface so that it's noise immune and can handle some
9 distance of travel over the vehicle, because in some
10 situations that TSM could be 50 feet away from our
11 control module.

12 Q Okay. All right. And what unit does the
13 time of flight calculation?

14 A So the time of flight calculation is
15 performed by the Ultra-wideband radio from Time Domain.
16 So what we get from that is the range result and
17 various data about that range and that goes into our
18 control module.

19 Q And how do you calculate or what calculates
20 the ground speed?

21 A The ground speed we use GPS course over
22 ground data. If we're in situations that we don't have
23 GPS, we just default to travel speed. That was a cost
24 savings measure for customers who didn't want to spend,
25 generally wanted to keep costs as minimal because other



1 ground speed monitoring would add additional equipment
2 and installation and maintenance expense.

3 Q Okay. But when you're using the GPS, again
4 that's an off the shelf module that's giving you that
5 ground speed information?

6 A It's a commercially available module, yes.

7 Q Okay. All right. And then the user
8 interface, that's the push button screen, right?

9 A Yes. There is an LED display as well as a
10 vacuum fluorescent display as well as keypads for user
11 input.

12 Q Okay.

13 A And audio.

14 Q And are you making those units? Are those
15 off the shelf units? What's happening there?

16 A So we actually manufacture the user
17 interface. We have a circuit board in there that we
18 assemble. The package is a custom design package. The
19 keyboard is a custom designed keyboard.

20 Q So you buy the LCD as a component and the
21 rest you kind of put together?

22 A The displays are purchased components, but
23 then everything else is a design of our own production.

24 Q And then earlier when we were talking about
25 the two basic uses of UWB, ranging and data



1 communication, again, as it's used in your AURA System,
2 this Collision Avoidance System, UWB is not used for
3 data communication. It's used for ranging, correct?

4 A There is data communication, but it's not
5 high volume data communication, which is what the other
6 leg of Ultra-wideband is used for. So to clarify, to
7 make sure this is clear, the one leg of Ultra-wideband
8 that's used for data communication, the promise that it
9 had was a tremendous amount of data could be
10 communicated because it's such a wide bandwidth. And
11 so what creators were doing was coming up with a
12 modulation scheme that created multiple channels of
13 communication in that bandwidth of Ultra-wideband. So
14 instead of having a single channel of communication,
15 there was multiple ones. And so you could get a
16 tremendous amount of data. But for regulatory reasons,
17 that's limited in how much distance you're talking, the
18 length of this table at best, usually, and still being
19 within the realm of regulatory allowances. So it's
20 impractical to use that version of Ultra-wideband for
21 ranging for anything outside of on your table.

22 Q So what type of data are you communicating
23 with UWB aside from just the ranging signal?

24 A There's identification so you know in that
25 data package, you know who sent the request for ranging



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1 and who is the intended recipient. It's targeted
2 ranging. So there's that data in there. There is also
3 a data packet for a few other parameters that I can't
4 remember details of. So there's small amounts of data
5 that are shared in that.

6 Q Okay. All right, let's turn back to your --
7 I'm sorry. Let's take a look at the 227 Patent, which
8 you should have now. It was marked as Exhibit 1001 in
9 the 470 IPR. Okay, I want you to turn to Claim 1 of
10 the patent. If I look at the claim, right, it talks
11 about having a vehicle mounted, a rail -- excuse me.
12 One or more vehicle mounted modules. It has a
13 transponder sensor module, an electronic control,
14 electronics module, and a user interface module. Do
15 you see that?

16 A Yes, I do.

17 Q Do those roughly correspond to what you call
18 the TSM, the CME and the UE?

19 A CEM. Yes. More than roughly they simply do
20 correspond to that. This patent application was
21 written with that system in mind because that's what we
22 had developed.

23 Q Okay. And so, as we noted, there's three
24 inventors on the patent, yourself, Mr. Carlson, and
25 Mr. Cygnus. Can you tell me which portion of these



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1 claims -- let's say Mr. Carlson was responsible for?

2 MR. SCHODDE: Objection. Beyond the scope.

3 THE WITNESS: It's easier to tell you Cygnus'
4 involvement because I can quantify that separately.

5 BY MR. WISNIA:

6 Q Okay. Why don't we start there.

7 A So Cygnus was involved in making the system
8 operate from a conceptual as well as implementation
9 standpoint, i.e., software. So he came up with the
10 ways of getting cooperative results of GPS measurements
11 and ranging measurements, determining when to use what,
12 how often to do this or that, and doing all the
13 intermodule communications. So that was a major part
14 of his contribution. But he came up with essentially
15 the operational sauce. I and Rick provided him with a
16 hardware platform to do that.

17 Q Okay.

18 A It's harder to distinguish Rick and my
19 contribution, because one of the things I actually
20 enjoyed working with Rick is that we didn't fight in
21 design. We worked very cooperatively in design. And
22 we often had similar thoughts. And so it was kind of
23 like doing design with your twin brother in that sense
24 of there's almost an uncanny cooperative mindset.

25 Q Okay.



1 A So it's very hard for me to actually
2 delineate to any detail. I know that I just found it
3 remarkable that we were able to think similarly, yet
4 enough differences to make it useful to be able to
5 complement each other in areas that we are weak.

6 Q Okay. So if I look at Claim 1, and based on
7 what you were telling me about earlier, which at either
8 this first meeting or shortly thereafter, you had this
9 idea of we could probably apply UWB to this problem. I
10 mean isn't that the whole concept of Claim 1? Is there
11 something in Claim 1 that's beyond what your initial
12 idea was?

13 MR. SCHODDE: Objection to foundation.

14 THE WITNESS: I'm not really understanding
15 the question.

16 BY MR. WISNIA:

17 Q Sure. Let me try to ask it a little bit
18 different.

19 A Right.

20 Q Which is, I mean, it seems to me that you
21 knew that you were going to have to, whatever system
22 you had, you need to have some sort of vehicle mounted
23 thing, right?

24 A Uh-huh.

25 Q And that if you're going to do it with a UWB,



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1 you need to have some sort of transponder, right?

2 A Uh-huh.

3 Q And if you're going to use UWB, right, you
4 need to have some sort of display for the user to know
5 that somebody's close or not close, right?

6 A Uh-huh.

7 Q And in any such system, right, you're going
8 to need some sort of IO control. And so you're going
9 to need some sort of control module, right?

10 A Yes.

11 Q So it seems to me like when I look at Claim
12 1, the general elements have to be kind of in your
13 original idea that you're going to have some sort of
14 transponder sensor module, you're going to have some
15 sort of control electronics module, and you're going to
16 have some sort of user interface module, right?

17 MR. SCHODDE: Objection. foundation.

18 THE WITNESS: I wouldn't entirely agree with
19 you. And the reason is that I recall having to battle
20 for that demarcation of devices, because for business
21 purposes people like to have as few a pieces as
22 possible because it's cheaper that way.

23 BY MR. WISNIA:

24 Q Okay.

25 A So you could have combined the control



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1 electronics module with the user interface, for
2 example, or if you really were aggressive, you could
3 put them all into one package. The problem is, as I
4 saw implementation wise, I was the champion to split it
5 into these three, because that way I could have the
6 TSM, the transponder, at a high location with a clear
7 line of sight for RF communications, had the user
8 interface where it needed to be for the operator's
9 reach and ability to give attention. But then the
10 control module, to put that where it was convenient,
11 out of the way, where all the IO and all the cabling
12 would go, any other solution would have made it a bit
13 of a rat's nest. So it's not quite that cut and dry.
14 And I know it isn't because I've fought that battle
15 continually for the last decade in terms of how we
16 package this. Did I answer your question?

17 Q You did. But again, that was your idea to
18 break these up into three different things. I'm kind
19 of thinking of it like, you know, it used to be the old
20 fight between did you want some sort of integrated
21 stereo or did you want to have a bunch of components?

22 MR. SCHODDE: Objection to foundation.
23 Argumentative.

24 BY MR. WISNIA:

25 Q I don't mean to argue with you. Please don't



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1 take offense. I was not trying to argue with you.

2 A I'm not offended.

3 MR. SCHODDE: And speculation.

4 BY MR. WISNIA:

5 Q All right. So let me ask you a fresh
6 question. I think what you're telling me is that it
7 was your idea to break them up into these three
8 different components?

9 A I'm not sure if it was my idea, but it
10 certainly was my -- what would be the correct word? I
11 carried the torch for that.

12 Q Okay. So in this patent, in this 227 Patent,
13 Claim 1, it's specific to UWB, correct?

14 A It mentions Ultra-wideband in the claim.

15 Q The idea that your predecessor had, which I
16 assume you haven't remembered his name, is that fair?

17 A It is true. I cannot remember his name.
18 Again I met him once at an interview and never had any
19 interaction with him after that.

20 Q I just don't want to be rude to the gentleman
21 by saying "that person" or "that predecessor". That's
22 it. I understand you haven't talked to him in a long
23 time. The idea that your predecessor had was to use a
24 narrowband ranging option, right?

25 A That's my recollection, yes.



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1 Q And that idea also would require time of
2 flight calculation, right?

3 A I don't recall if he went into even that
4 detail. It was a concept that he had. It was just
5 concepts for consideration by the customer. And I
6 think the idea was if they liked a certain concept,
7 then he would go forward with that concept. I don't
8 recall it having any detail other than the conceptual
9 level of what it was. I think that's an implementation
10 detail that wasn't included in his concept.

11 Q Were you familiar at the time, was there a
12 different way to do ranging in such an arrangement
13 without time of flight calculation?

14 At that time, were you aware of a
15 different ranging option besides time of flight for
16 such an arrangement?

17 A I believe I was probably clueless at the
18 time, and I was learning what I could do at that time.

19 Q I mean, if I took Claim 1 of the 227 Patent,
20 and I said, you don't have to use UWB, you can use any
21 sort of frequency that you wanted, would that be your
22 invention or would that be your predecessor's
23 invention?

24 MR. SCHODDE: Objection. Foundation. Form.

25 THE WITNESS: My predecessor didn't develop



1 enough to consider anything in invention. It was just
2 a concept of what to use. And like I said, I don't
3 remember any implementation detail in what he said.
4 Like I said, the first thing I did after that meeting
5 was I never looked at it again. And I don't mean that
6 as disrespectful as it sounds. It's just that my
7 experience told me I needed a better solution.

8 BY MR. WISNIA:

9 Q So do you believe that you invented basically
10 what we have in Claim 1, if it's not limited to UWB, in
11 other words, you'd use something else besides UWB?

12 MR. SCHODDE: Objection to form. Foundation.
13 Incomplete hypothetical.

14 THE WITNESS: Yeah. I don't know if I know
15 enough to give you a confident answer in that respect.
16 Ask your question again for me. I want to make sure
17 I'm giving your question a fair consideration.

18 BY MR. WISNIA:

19 Q Sure. Do you believe that you invented Claim
20 1 of the 227 Patent if we broadened it by saying it
21 doesn't have to be limited to the UWB, you could use
22 any sort of communication that you wanted or different
23 communication besides UWB?

24 MR. SCHODDE: Hold on. Objection. Form.
25 Foundation. Incomplete hypothetical.



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1 THE WITNESS: To answer that, I would have to
2 know of the whole body of what has been done out there,
3 and I don't pretend to know that. So I would have to
4 say I don't really know.

5 BY MR. WISNIA:

6 Q Okay. Let's take a look back at your
7 Declaration, which is Exhibit 2009. And let's turn to
8 Paragraph 22.

9 A I am there. Paragraph 22.

10 Q Before the break, we talked a little bit
11 about this second sentence in Paragraph 22. You just
12 want to reread it, get yourself, have it in mind when I
13 start asking some new questions.

14 A Okay.

15 Q So we talked about operated defined detection
16 and alarm criteria. One of the other items you talked
17 about was "integrated expandable hardware options".
18 What does that mean?

19 A Before I answer that, can I go back? I want
20 to clarify a statement I made previously on the
21 operator defined.

22 Q Sure. What would you like to say?

23 A Before what I said was operator defined, as
24 in the rail operator, the railroad, for example. But
25 to be perfectly clear, there actually were some user,



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1 as in the driver of the vehicle also had a few things
2 that they could adjust as well for completeness.

3 Q Sure.

4 A For example, if they had a trailer attached
5 to their vehicle, that's not a full time event. And so
6 they could actually configure the device to add the
7 trailer onto their length. So that the rear of their
8 vehicle, or if it was in front they're pushing it was
9 still known appropriately, because if you didn't do
10 that, you could have a collision before you thought you
11 were going to collide.

12 Q Okay.

13 A So there's actually both user and the
14 railroad operator configurable aspects to this.

15 Q Okay.

16 A I wanted to do that for completeness. All
17 right, so your question again --

18 Q Well, before we move on. I just want to make
19 sure. Do you now feel your answer is complete with
20 respect to that?

21 A Yes, I do, and thank you.

22 Q Let's talk about "integrated expandable
23 hardware options". What did you mean by that, sir?

24 A We built parts of the system to allow for
25 expansion. As an example, there is interface, unused



1 interfaces in the basic system that we ended up using
2 later when machines had particular characteristics to
3 them. So we didn't just build it for the first five
4 machines that we saw. We tried to take into account
5 the possibility that there would be some additional
6 features interfacing that we might need. And turned
7 out that paid off very well, because we have made use
8 of a number of those features in certain installations.

9 Q Okay. Are you familiar personally with the
10 Piper systems?

11 A I am only familiar with the Piper systems
12 from the documentation that's publicly available either
13 on their website or, for example, I looked at their
14 brochures at the Next-Gen Rail Conference that I was at
15 in October. Yeah, that was October.

16 Q Okay.

17 A I have not had the ability to personally see
18 one firsthand. That would require me to go to a
19 customer site or go on customer equipment, which I
20 think they probably wouldn't appreciate because I'd be
21 trespassing.

22 Q Was the inclusion of this expandable hardware
23 options, as far as you know, was that important to
24 customers in the decision of whether or not to buy the
25 AURA CAS system?



1 A I doubt it, because they weren't really
2 necessarily aware of that. They were looking for a
3 Collision Avoidance capability. The importance of
4 those was more to us because it allowed us to deal with
5 variations in equipment that we experienced. So, as an
6 example, we had already installed a number of systems
7 when we found out there was another machine that had
8 some characteristics that we had to accommodate, and we
9 ended up using that interfacing. The customer was not
10 at all involved in anticipating that, specifying that
11 they weren't even aware of it. It's just a special
12 consideration for installation that we created.

13 Q All right. The next portion you have here in
14 22 "is the ability to function in all environments, in
15 terrain, even tunnels." Do you see that?

16 A Yes, I do.

17 Q All right. So tunnels, I think is pretty
18 self-explanatory. What other environments and terrain
19 were you concerned about?

20 A So in the rail environment, obviously, you
21 have to have a pathway for the track. And as you
22 mentioned, you could have a tunnel. You also have
23 things like, I'll call them a rock cut, essentially a
24 valley that you're going through that can also impede
25 your ability to make range measurements with some



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1 technologies. You also can be in some heavily forested
2 areas. You can be in an urban canyon with buildings.
3 That's all that comes to immediate mind at the moment
4 there. Obviously, in terms of environments, we're
5 talking about cold and heat and rain, snow, dust.

6 Q All right. Take a look at Paragraph 25.
7 Well, I'm sorry, I skipped. Read 24. It spans Pages 7
8 and 8.

9 A Okay. I have read Paragraph 24.

10 Q Okay. Does the AURA system require the use
11 of both time of flight measurement and GPS data to
12 determine a separation distance between two MOW
13 vehicles?

14 A I think the answer to that would be no,
15 because it could accomplish that with either.

16 Q And does it accomplish it with either?

17 A Yes, it does.

18 Q All right. Is it fair to say that in a
19 multitrack environment, you can't just use time of
20 flight to accurately determine separation distance for
21 Collision Avoidance, right?

22 A I can see why you might think that. With
23 Maintenance of Way equipment in particular, you can
24 have a situation where there's a collision by equipment
25 on two different tracks. And so at one time I fretted



1 about that possibility and was concerned that even with
2 GPS, without any augmented capabilities, that you might
3 not be able to determine which track you're on. But in
4 reality with maintenance equipment in particular, it's
5 good to know that there's a machine passing by you,
6 even if it's not on your track, because it can still be
7 a threat to you.

8 Q What about let's say in just rail vehicles,
9 excluding Maintenance of Way. In other words, what I
10 mean by that is, if I'm a train operator, I assume I
11 don't want to get a warning every time a train is
12 coming at me, coming in my direction on a different
13 track. Otherwise, I'm going to get a bunch of false
14 positive alarms, correct?

15 A That would, again, be something that you
16 would think. But there may be some situations where
17 the railroad operator actually wants to know there's
18 another vehicle coming on another track, because --
19 just because a train is on another track doesn't mean
20 it's a potential threat to you. You may not have ever
21 seen this, but on occasion rail cars derail and they're
22 no longer in their envelope and the train operator
23 doesn't know it yet, the engineer still doesn't know
24 it. Or in some cases the cargo has shifted and is
25 hanging off the train and it still can be a threat to



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1 you. So it's not quite as black and white as one would
2 think. That is one of the things that I learned in the
3 course of this industry is that sometimes you would
4 think that you wouldn't have to worry about that, but
5 in fact, that is a potential threat. So it could be a
6 nuisance or it could be a useful data point.

7 Q And so in the AURA CAS system as it's used in
8 non-Maintenance of Way systems, are operators being
9 warned about oncoming traffic that's not on their
10 track?

11 A So when we put it into the transit
12 environment, for example, in New York City, in that
13 situation when we were doing the proof of concept, we
14 were only operating on the single track. And so we
15 didn't have to deal with that situation. If we were
16 doing an implementation, we would be determining the
17 track we were on. So you could have it exclude a
18 warning.

19 Q In normal operation of the AURA system,
20 you're collecting both the time of flight data and the
21 GPS data, right?

22 A That is correct.

23 Q And so when you're trying to resolve the
24 separation distance between the two objects, are you
25 using one and then using one of the time of flight or



1 the GPS data, and then confirming it or augmenting it
2 with the other?

3 A What we generally do, and I say generally,
4 because I don't know if there may be some specific
5 instances, but generally the Ultra-wideband data, if
6 you have it and it has markers in it that indicate it's
7 of good integrity, in other words, something you can
8 depend on, then we would give that preference over GPS
9 because we can get higher precision with
10 Ultra-wideband. So essentially Ultra-wideband unless
11 not reliable or available.

12 Q Okay. Ultra-wideband first and then
13 augmented by the GPS, is that fair?

14 A It's not entirely black and white. And the
15 reason is because we still use, if available, GPS for
16 other data points, for example --

17 Q Ground speed.

18 A -- and we can know in which direction it's
19 ahead or behind us, for example. Because with the time
20 of flight measurement, you don't have directional
21 information from that unless you have directional
22 antennas and separate ranging systems.

23 Q Okay. Paragraph 25 says that "The AURA CAS
24 is a MOW vehicle." I'm sorry. "The Aura CAS in a MOW
25 vehicle is designed to include central tracking



1 functionality. This functionality is used to track the
2 location of one or more MOW vehicles that are equipped
3 with a similar or a CAS." What is "central tracking
4 functionality"?

5 A The issue when you're doing Collision
6 Avoidance in a dynamic environment, and what I mean by
7 a "dynamic environment" is things change. So one
8 moment Vehicle A might be ahead of you and Vehicle B
9 might be behind you, but then there could be a shift in
10 vehicles, a substitution, one might be going off. So
11 you have to constantly allow for the possibility that
12 your threat ahead of you and behind you has changed.
13 And so the way we handle that is we have what we call a
14 central tracking -- I can't remember the term we used,
15 but that is essentially covered by the central tracking
16 functionality. And what that is doing is it keeps
17 track of all vehicles within communication range. So
18 it always knows all the possibilities out there as
19 threats and then examines all that data and determines
20 which is your threat ahead of you and which is your
21 threat behind you.

22 Q And is that something that was important to
23 customers?

24 A It's not something that they were aware of
25 necessarily. It's got to have a central tracking



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1 capability. That's not something that they knew about,
2 but it was important to them from a functional
3 standpoint I suppose. In some situations it wouldn't
4 be necessary, but in some situations it enhances the
5 capability probably. But what was your question again?

6 Q Is that something that was important to
7 customers?

8 A It's something that customers really wouldn't
9 know about.

10 Q Do you think that this functionality has any
11 impact on the commercial success of the AURA system?

12 A I'll have to think about that. It's really
13 hard to say. I'm having a hard time distinguishing
14 between what's important to me when I'm observing
15 operation of the system and what's really necessary in
16 the operation of the system for its intended purpose.
17 And what I mean by that is, if I am investigating a
18 behavior or an issue or a device isn't working
19 properly, I need more data than the system needs for
20 normal operation. So for diagnostic purposes it's very
21 handy to have. But is it actually necessary for system
22 operation? I can't give you a confident answer at the
23 moment because the system might be able to work fine
24 without it, but there might be something that I'm not
25 thinking of. I'm just not comfortable giving you a



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1 definitive answer in that because, frankly, I'm not
2 sure at the moment. I would have to really think that
3 through.

4 Q Okay. So one of the things I assume your
5 customers are interested in is robust protection,
6 right?

7 A Yes. I would say that would be the case.
8 They're hoping to have a -- if not elimination or a
9 significant reduction in collisions of their vehicles.

10 Q Okay. And do you think the use of this
11 central tracking functionality helps in reducing the
12 number of potential collisions?

13 A I don't really know at the moment. I
14 couldn't give you a strong answer on that because I
15 have to really think about nuances of that. If there's
16 something that's absolutely vital or if it's not, I
17 don't know for sure.

18 Q Okay.

19 A Apologize for -- you've stumped me on that
20 one.

21 Q All right. There's a picture below Paragraph
22 27.

23 A Yes.

24 Q Is that the product that was obtained from
25 Time Domain?



1 A No, but the product that's obtained from Time
2 Domain is contained within there.

3 Q All right. The thing that's in orange.

4 A Yes.

5 Q What is that?

6 A That is a radome. That is R-A-D-O-M-E. A
7 radome is a protective covering over an antenna,
8 protects it from weather generally. So inside of there
9 is -- that's the weather cover over the Ultra-wideband
10 system antenna as well as the GPS antenna.

11 Q Okay. All right. If you take a look at
12 Paragraph 30, there's a discussion of the user
13 interface module. You see that?

14 A Yes, I do.

15 Q And there's a mention here about having
16 "tactile feedback keypad control panel". Do you see
17 that?

18 A Yes, I do.

19 Q Is that important?

20 MR. SCHODDE: Objection to form.

21 THE WITNESS: I would say that it's in a gray
22 area, because would it function if it wasn't -- I need
23 to understand your question more. So that you're
24 talking about the tactile feedback keyboard control
25 panel. Is it important? Is it important in what



1 respect? I need to understand that better.

2 Q Well, is it, let's say important for
3 customers?

4 A I would consider that a gray area because
5 some customers may never touch their system. So for
6 them it's totally unimportant. Some customers might
7 use it frequently because they do configurations with
8 it or they check certain aspects with it. So the
9 answer is yes and no. I don't know. Could be either
10 way.

11 Q All right. I want you to turn now. We're
12 going to jump to Paragraph 35.

13 A All right.

14 Q So I've been asked to describe the skepticism
15 that Metrom Rail's Aura CAS encountered when it was
16 first offered for sale." You see that?

17 A Yes.

18 Q And what is the date to the best you can
19 remember when it was first offered for sale?

20 A I don't know the date when they were really
21 selling it. We had a launch customer. I only know
22 when we first installed the systems, which I told you
23 earlier was in that December date.

24 Q All right. So what I'm trying to do is
25 trying to figure out the time frame you're talking



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1 about in Paragraph 35. Are you talking about
2 Decemberish of 2012?

3 A Yes.

4 Q Okay.

5 A And the reason why I remember that is because
6 it was at Christmas time and I was traveling. So that
7 one sticks in your mind.

8 Q Sure. Always a lovely time to be stuck on
9 the road. All right. So if we now look at Paragraph
10 36, you write, "Our efforts to market AURA CAS to Class
11 1 freight rail were initially met with skepticism
12 because they had witnessed previous failed attempts at
13 Collision Avoidance." Do you see that?

14 A Yes.

15 Q What is "Class 1 freight rail"?

16 A Class 1 freight rail is actually federally
17 defined when there is a rail operator that is above a
18 certain revenue level. I believe they hit a threshold.
19 And once you reach that threshold, additional
20 regulation comes upon you courtesy of the Federal
21 Railway Administration. So a Class 1 in the United
22 States used to be seven railroads. Now it's six
23 because Canadian Pacific has absorbed one.

24 Q Okay. And so you gave me a list of five
25 before, which was BNSF, CN, UP, Norfolk Southern and



1 CP. Are those all Class 1?

2 A Those are all Class 1. There's also CSX and
3 Kansas City Southern. But Kansas City Southern, I
4 believe, has now been absorbed by Canadian Pacific.

5 Q Those other two, did you ever make
6 presentations to?

7 A Probably. I don't think I was involved in
8 those. I would be surprised if we did not.

9 Q All right.

10 A In fact, I'm almost positive we did. I just
11 wasn't in those presentations.

12 Q But neither of those companies are customers,
13 is that right?

14 A I couldn't give a confident answer in that
15 because I want to say at least one, if not both of
16 those have purchased at least some number of units, but
17 I'm not certain. Unfortunately, that's not in my
18 direct purview.

19 Q Okay. So you say, "Our efforts to market
20 AURA CAS to Class 1 freight rail were initially met
21 with skepticism because they had witnessed previous
22 failed attempts at Collision Avoidance."

23 Who is the "they" in the sentence?

24 A Well, certainly the first individual that we
25 met with at CN, his skepticism was rather clear. But



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1 in subsequent customers we met with, you could tell
2 that they would only believe it when they saw it.

3 Q So you're right. "For example, the decision
4 maker for the first demonstration took us to what he
5 apparently considered the acid test. Two MOW vehicles
6 were equipped with the AURA CAS." Do you see that?

7 A Yes, I do.

8 Q Who is this decision maker we're talking
9 about in this paragraph?

10 A This is the individual I told you about
11 before that I can't remember his name at CN who was a
12 grizzled railroad veteran.

13 Q Okay.

14 A He was on the vehicle -- the two photographs
15 here that you see. I was on that vehicle. Rick
16 Carlson was on that vehicle. The operator and this
17 individual, and I believe at least one of his
18 subordinates, one of his managers, were on the vehicle.

19 Q Okay.

20 A And so I was witnessing his reaction
21 firsthand.

22 Q Understood. I'm picturing like some guy from
23 like an old Western movie. That's not even a question.

24 A He wasn't a bad guy. He just was very
25 skeptical.



1 Q All right. So you say in this Paragraph 36
2 that "they", and you mean this gentleman from CN, had
3 witnessed previous failed attempts at Collision
4 Avoidance. And now I know you'd mentioned earlier that
5 they had tried to have these operation rules. What
6 other attempts, if any, that he had witnessed at
7 Collision Avoidance that you're aware of?

8 A I don't know anything firsthand at all. When
9 we got to this site, I could see a little bit of a
10 change in his personality because it was obvious that
11 he was ready to see us fail.

12 Q Okay.

13 A That he was confident that nobody had found a
14 way to deal with this situation.

15 Q This situation being one MOW vehicle in the
16 clear and one in a tunnel?

17 A Or just anytime any entered into the tunnel,
18 because apparently all of his previous systems had
19 depended on GPS or perhaps they used some type of a
20 ranging solution that didn't work well when it was in a
21 tunnel. And that could have happened as well.

22 Q So, I'm sorry. Did he talk about these
23 previous systems using GPS and ranging or are you just
24 kind of guessing?

25 A Again, this is very old knowledge. This is



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1 over a decade ago when this was happening or about a
2 decade ago. But I believe that I might have learned
3 that secondhand from other people who had talked with
4 him or perhaps he had verbalized that to me. But
5 reading him at the time, I could tell by the change in
6 his personality as we were approaching this spot, it
7 was going to be an epic moment for him.

8 Q Okay. And so when you were writing up this
9 Declaration, did you have any sort of source documents
10 you were looking at? Did you have like any notes?

11 A No. This is one of those events you
12 remember. I've had trouble remembering a lot of things
13 here, but this event I remember crystal clear, because
14 in my career, there's a couple of points in my career
15 where you have an incredibly skeptical customer who is
16 instantly transformed by something that you do, say or
17 perform, whatever. And this was one of those moments.
18 And that's why I remembered it. And that's why I still
19 have these photographs, because it's a very fond
20 memory.

21 Q Okay. And so is this in the December 2012
22 time frame that this is happening?

23 A This would have been at least six months
24 prior. We've got green on the trees there. So it's at
25 least spring of 2012.



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1 Q Okay. So this is your proof of concept?

2 A I think we might have done two proofs of
3 concept demonstrations. I think this was the first
4 one.

5 Q Okay.

6 A The second one, I think, was done not for CN.
7 I think one of their companion railroads was interested
8 in, so they were invited to observe.

9 Q And so at the time that you did this testing,
10 did it have three separate modules? Did it have a TSM,
11 CME and a user interface?

12 A CEM, by the way. CEM.

13 Q I apologize.

14 A At the time of this demonstration, it was a
15 proof of concept. So it wasn't a real packaged
16 product. It was just placed temporarily on the device.
17 And so for this test, the CEM functionality was
18 incorporated in a touch screen PC computer. So it was
19 all one device there. But then there probably was a
20 partial example of the CEM there. So the CEM
21 functionality was actually split between two places
22 because it was a proof of concept demonstration. It's
23 not the final packaging of the device.

24 A All right.

25 Q And did you have GPS at this time, or --



1 A Yes, we did.

2 Q And was the TSM, was that this P400 or was it
3 a different thing?

4 A At this time it was a P400 probably, yes.

5 Q Okay.

6 A The P412 was in process, I suspect.

7 Q All right. So you're on these maintenance
8 away vehicles. You have your proof of concept set up
9 between the two different Maintenance of Way vehicles.
10 One's in the tunnel. You guys are in the one that's
11 not in the tunnel, I assume.

12 A That is correct. We're the one. We're
13 watching the other machine enter the tunnel.

14 Q Okay. And take it from there. What happens?

15 A So, as I said, as we pulled up here, we
16 stopped for a moment and the gentleman explained his
17 moment for us, that they were going to have that
18 machine drive into the tunnel and he wanted our system
19 to maintain contact with that and maintain an
20 indication of the range is what I think he was looking
21 for.

22 Q Okay.

23 A And so in the paragraph -- the picture on the
24 left, that's where we stopped and we're having that
25 conversation. And then we just stayed in a fixed



1 location and he called, had his operator call to the
2 man driving the vehicle up ahead and told him to drive
3 into the tunnel. As he drove in the tunnel, all eyes
4 were focused on our display showing the ranging, and
5 there was not a single glitch in it. It continued
6 showing an increasing distance. And then he called the
7 guy and told him to stop. He stopped and the digits
8 stopped. And you could still see them. You can't see
9 it in this photo very well. If you took a magnifying
10 glass you can actually at that point see where the
11 vehicle was in there. It went just a little bit
12 further in at that point, but it continued to have
13 contact and ranging successfully the entire time with
14 that device.

15 Q Okay.

16 A And the reason why the moment was so
17 memorable to me was because this gentleman's
18 countenance changed into a mode I had never seen on his
19 face ever before in all our meetings with him. I knew
20 before he said a word that we had successfully
21 demonstrated it for him. And I was confident at that
22 point we were going to sell them units because the
23 change was so remarkable over his face.

24 Q Okay.

25 A And, in fact, he said good things. And then



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1 he said, that's enough for me, and he went on to do
2 other business. He was satisfied. Clearly he was
3 satisfied.

4 Q So this gentleman, which you refer to as the
5 decision maker in your Declaration, is that right?

6 A Yes. He was definitely the decision maker,
7 yes.

8 Q You write in Paragraph 37 that "The decision
9 maker was not expecting that result." Do you see that?

10 A Yes.

11 Q "We believe based on prior failed attempts to
12 demonstrate other MOW Collision Avoidance systems."

13 Do you see that?

14 A Yes. Okay.

15 Q I think you've explained why through
16 mannerisms and your ability to read people why you
17 think he wasn't expecting that. But did he say
18 anything actually directly to you about it?

19 A This is over a decade ago. So my memory is a
20 little foggy in that respect. All I have is the
21 memories of my impressions and what I observed at the
22 time. And so I'm not sure entirely if those were based
23 on visual only or on things he said. There probably
24 was some things he said, but I do recall that he knew
25 exactly where he wanted to go for this demonstration.



1 And it clearly wasn't the first time he had done this.
2 Because this is the guy that sits back in the office.
3 And this is the only time I ever saw him on these
4 machines. The next demonstration that we did, he was
5 not present for that, that I recall. And so the fact
6 he knew exactly where he wanted to go and exactly how
7 he wanted to do the demonstration, I was rather certain
8 that this wasn't his first rodeo, so to speak.

9 Q Okay. How long after this demonstration did
10 you get the order?

11 A My boss, Rick, had made a statement to me.
12 And he said if we do one successful demonstration, that
13 he was confident we'd have the order. And I was not so
14 confident just simply because it just seemed too quick
15 and easy. But when I saw the change in the countenance
16 on this individual, I was just as confident. And as
17 far as I know, we had the order at that point because
18 we were moving forward with production implementation.
19 I couldn't tell you for certain that we had a purchase
20 order the next week or a week later. You'd have to ask
21 Mr. Markey for that. He would have better knowledge of
22 that probably. But I do know that it was full speed
23 ahead. And I don't think we would have made that
24 investment in personnel and equipment and built up 60
25 units was our first production build, if we didn't have



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1 an order for that. And I know that December near
2 Christmas time I was not home.

3 MR. SCHODDE: We're well over an hour. Is
4 this a good spot for a break?

5 MR. WISNIA: Sure. Why don't we take a break?

6 THE VIDEOGRAPHER: Going off the record at
7 2:42 p.m.

8 (BRIEF RECESS)

9 THE VIDEOGRAPHER: Going on the record --

10 MR. WISNIA: Yeah, if everybody's ready, I'm
11 ready.

12 THE VIDEOGRAPHER: Going on the record at
13 3:01 p.m.

14 BY MR. WISNIA:

15 Q Sir, you understand you're still under oath?

16 A Yes, I do.

17 Q All right. Earlier we were talking about the
18 fact that in the AURA system some data is transmitted
19 by UWB, is that right?

20 A That's correct.

21 Q And I think you'd mentioned like some header
22 data, am I getting that right?

23 A There is data on the Ultra-wideband. At a
24 minimum we are identifying the sender as well as the
25 intended recipient. So we have unique identification



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1 that is provided with those. And I'm a little bit
2 foggier on any other data that's sent along there. But
3 certainly a very primary part of that is who's sending
4 it and who's receiving it because that's necessary for
5 the point to point ranging process.

6 Q Okay. And is that some sort of standard
7 protocol or standard that you guys are using?

8 A Like an industry standard?

9 Q Yeah.

10 A No. It's not an industry standard that we're
11 using.

12 Q Okay. All right. Let's get back into your
13 Declaration. Where did we end up? All right, so now
14 let's take a look at Paragraph 38 of your report.

15 A I am there.

16 Q And you say that "UWB radio was an unfamiliar
17 technology to everyone that we met during our marketing
18 of the AURA CAS." See that?

19 A Yes, I did.

20 Q How many different people are you talking
21 about there?

22 A I'm talking about every Class 1 and transit
23 operator that we talked to up until we did the first
24 proof of concept with New York City Transit.

25 Q They never had heard of UWB?



1 A I don't think I ran into anybody who had.
2 And for example, I had a few RF contractors that I used
3 along the way and each one of them was unfamiliar with
4 Ultra-wideband.

5 Q Okay. Can you identify for me each of the,
6 by name, the particular people you're referring to that
7 were unfamiliar with UWB during your marketing?

8 A Oh. I'm struggling to think of any names of
9 individuals we met with. They were new individuals to
10 me then and I haven't spoken to them much since then or
11 at all. The first contact I had with New York City
12 Transit, I remember the individual, but I can't tell
13 you his name. He was the Head of Innovation or New
14 Technology, New York City Transit or it might have been
15 MTA. He might have been with one of the parent
16 organizations. But I can't even remember his name at
17 the moment either.

18 Q What year was that?

19 A It was either early -- it was either early
20 2017, or it could have been back in 2016.

21 Q How did you meet this person?

22 A I don't know how we came in contact with the
23 individual, but we had a meeting with him to present to
24 him ideas we had for using Ultra-wideband for New York
25 City Transit.



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1 Q And you went to his office in New York or did
2 they come out to see you in Illinois?

3 A We went to New York City and met in some
4 conference room at MTA headquarters in lower Manhattan.

5 Q Okay. Can you identify for me anyone else
6 who you believe was unfamiliar with UWB radio
7 technology during the marketing of the AURA CAS?

8 A All I can remember is the first name of one
9 guy in Boston, Jamie. I can't remember his last name.
10 He was one of the signal engineers that we met with. I
11 can't remember his last name. And there's a number
12 of -- I met a whole large number of people at the MBTA
13 in Boston that I am -- I remember one guy now in
14 Boston, the Head of Safety, Ron Nickle. I'm sorry.
15 I'm having trouble remembering other names. Clearly
16 remembering names is not my strength.

17 Q What year was the -- I don't mean to
18 interrupt unless you're -- are you finished?

19 A Go ahead.

20 Q When did you meet these folks, Jamie and Ron
21 Nickle, from Boston?

22 A Jamie might have been, as 2013, 2014. And
23 Ron Nickle probably would be concurrent with that or
24 similar timing.

25 Q Were they engineers or technical people?



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1 A So I'm not sure of Ron Nickle's background.
2 He was their Head of Safety for the MBTA. So he seemed
3 to have some technical background. I don't know what.
4 Jamie was a signal engineer, so he should have been
5 technical. And he was one of our primary interfaces
6 with the MBTA, and that's why I remember him. But it's
7 been a few years since I've spoken with him. So the
8 last name has faded.

9 Q And were you guys marketing the AURA MOW
10 collision system, Collision Avoidance system to MBTA?

11 A At that time, what we were doing was
12 marketing AURA, Collision Avoidance for work equipment,
13 but then also pursuing additional applications like
14 addressing train control and train collision issues
15 with them. The MBTA was a unique situation. One of
16 the few carriers that has no train control system on
17 their green line at that time.

18 Q In Paragraph 38, you write, "Even radio
19 engineers became increasingly skeptical when told that
20 the UWB ranging system utilized an Ultra-wideband
21 radio." See that?

22 A Yes.

23 Q And I think you mentioned earlier that you
24 had some contractors? Is that what you're referring
25 to?



1 A No, but they're similar in that respect.
2 What I'm talking about here is on occasion when we were
3 meeting with a railroad or a transit agency, they would
4 bring in some of their radio communications people, or
5 people familiar with RF communications. And it's a
6 consistent thing I have noticed for the last decade
7 that anybody who has conventional radio knowledge is
8 generally -- has a very difficult time wrapping their
9 head around Ultra-wideband. It throws everything
10 upside down.

11 Q Can you identify any of the radio engineers
12 particularly?

13 A No, I couldn't. That was the first time and
14 last time I met them.

15 Q Okay. If you take a look at --

16 A Not from memory anyway. Certainly. Sorry.

17 Q Okay. If you take a look at Paragraph 39,
18 you say, "Because of the extreme bandwidth of the UWB
19 radio signal, engineers in the industry were concerned
20 that the outgoing UWB signal would interfere with the
21 operation of other radio systems used for the purposes
22 by the railroads because by definition, UWB radio emits
23 across numerous frequencies licensed for use by other
24 services." Do you see that?

25 A Yes, I do.



1 Q Who in particular voiced that concern?

2 A Again, I don't remember specific names, but I
3 was -- the same types of engineers when they would
4 bring in RF engineers and we'd be talking to them,
5 presenting to them, when you have an engineer from a
6 narrowband background, in their mind, you have a
7 dedicated frequency or you have some type of
8 interference mitigation system in place, and here
9 you're talking about transmitting over a two gigabit,
10 sorry, 2 gigahertz wide bandwidth. They get very
11 concerned because it's totally unlike what you do in
12 the narrowband realm. You don't do that. You avoid
13 common frequencies. And it's just a complete paradigm
14 shift that is difficult for conventional radio
15 engineers to understand.

16 Q And so how did you guys solve the problem?

17 A Of convincing them?

18 Q No, no. I mean, but what they're saying is
19 that the UWB would interfere with operation of other
20 radio systems. How did you make sure that your system
21 didn't do that?

22 A I want to preface that with an expansion of
23 what I was just saying to help set the context. When
24 we wanted to get a waiver from the FCC for
25 Ultra-wideband in fixed locations in New York City, we



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1 were meeting with engineers at the FCC, and then it was
2 put out for public comment. And there's various
3 entities that reacted very negatively because for the
4 same reason you're transmitting on these frequencies,
5 you're going to interfere with us. So even people that
6 are very well-educated in this arena are often very
7 paranoid of Ultra-wideband because it transmits on all
8 these frequencies. What they don't understand is that
9 inherent in the implementation of Ultra-wideband to
10 comply with the FCC regulations is the Ultra-wideband
11 devices have to transmit at a lower average power level
12 than intended, than even unintended devices. So, for
13 example, the power supply on the laptop, it can
14 transmit more unintended energy at a given frequency
15 than an Ultra-wideband system can when its transmitting
16 purposefully. So it is that and some other factors
17 like very low duty cycle makes it inherently unlikely
18 to interfere with other systems. But it does transmit
19 energy. So it can interfere with some very sensitive
20 systems if it's at close enough range. And that is the
21 mitigation technique is to provide some separation or
22 sufficient filtering so that there is no interaction
23 between those.

24 Q And so how did you go about doing that?

25 A So what we did in our situation was we made



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1 sure we kept separation between RF systems that were
2 sufficient to avoid interaction between them and made
3 sure that -- reviewed the filtering that Time Domain
4 used in their implementation of their Ultra-wideband
5 transmitter to make sure that it had significant
6 rejection at the various frequencies. And then we
7 would do some testing of compatibility between the
8 systems.

9 Q So did Time Domain have to modify the
10 product?

11 A They did not have to because they'd had done
12 a pretty good job of that. So the combination of their
13 inherent engineering that they had done previously, as
14 well as being judicious and how we applied the system
15 and provided either separation or filtering of other
16 things that had to be nearby, we were able to
17 accomplish the objective of avoiding harmful
18 interference between them.

19 Q Okay, but primarily, the skepticism that
20 you're talking about with these RF engineers, other
21 folks, was a matter of just a misunderstanding, right.
22 They didn't have the education to know that in your
23 view, they didn't have the education to know that these
24 UWB signals operate at such a low power that they're
25 not going to interfere even though they're operating on



1 the same frequency as other products.

2 A Yeah. Primarily it is a paradigm issue. But
3 it's surprisingly systemic in the industry. It's very
4 rare to meet an engineer who knows enough about that to
5 know better.

6 Q But, I mean, this is not a phenomenon that
7 you discovered, right?

8 A No, it's not a phenomenon I discovered, but
9 it's a resistance that I have dealt with for over a
10 decade. And so it's a very rare event when I meet an
11 engineer that gets it. Dr. Kuklev, when I met him back
12 in September via the conference call, my counsel
13 probably remembers I was actually kind of giddy on the
14 call because it was so refreshing to have somebody who
15 had a clue about Ultra-wideband because it's a really
16 rare event. Even though Ultra-wideband exists, and
17 some people have heard of it before, even most radio
18 engineers really don't get it.

19 Q Got it.

20 A It's just no experience with it. And it's
21 not that they're deficient, they just have no
22 experience with it. And it turns the whole paradigm
23 upside down. If somebody told you you're going to fly
24 an aircraft without wings, you couldn't believe it
25 because you're so used to aircraft always having a



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1 wing.

2 Q Yeah. Are you familiar with "Spread-spectrum
3 transmission"?

4 A Yes, I am.

5 Q It's kind of the same thing?

6 A Right.

7 Q Which is that you're transmitting a bunch of
8 stuff across multiple frequencies, but you have such a
9 low power that other things can operate at those
10 frequencies?

11 A Yeah. Although Spread-spectrum it does
12 reduce interference. But what actually happens in
13 Spread-spectrum is it does interfere, but not
14 continuously. And so Spread-spectrum gives you the
15 opportunity to still get the message through because
16 it's not continually interfering. It's, for example,
17 frequency hopping Spread-spectrum. It's on 10, 20
18 different channels. Maybe five of them interfere, but
19 the other ones don't. And so as long as both systems
20 get a clear channel periodically, you can still get
21 data through. Whereas, with Ultra-wideband it's a much
22 lower transmission level spread out over an incredibly
23 wide bandwidth.

24 Q Okay. So now if I look at Paragraph 40 and
25 this touches on, I think, what you were just saying.



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1 "In addition, when told that the UWB operating power
2 level was low, some became concerned that the UWB
3 radios would not perform their Collision Avoidance
4 function because of incoming interference from other
5 radio systems being used by the railroad." Do you see
6 that?

7 A Yes, I do.

8 Q Which specific radio systems were they
9 concerned about?

10 A I don't always know the specific ones, but
11 sometimes they had certain radio systems that they were
12 using. But in the case of like New York City Transit,
13 I think they were using some ISM band radios in the 5
14 gigahertz region perhaps. And even in the 2.4 it was
15 on the edge of systems. So that could be what some of
16 their concern might be. I don't remember specific
17 examples outside of that. But sometimes there is also
18 data communications using either a licensed frequency
19 or a frequency band that I didn't mention there that is
20 not coming to my mind.

21 Q But again, this concern they had was just a
22 matter of miseducation, right? That the fundamental
23 nature of UWB is the reason why this concern they had
24 was not a problem. It's not because of some sort of
25 discovery that you made, is that right?



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1 A I mean, I didn't change the world in that
2 respect. You mean discovery? No, but it was a
3 knowledge type of an issue that was few and far between
4 in my experience. It was a constant battle along the
5 way. And even still today, it's rare to find people
6 who get it. But it's not to say that you can't have
7 interference with Ultra-wideband. There are situations
8 you could still have interference. But you have to be
9 educated and not talking a school education
10 necessarily, but in terms that you have to be familiar
11 with that technology and understand what it's doing and
12 make good judgments as a result of that.

13 Q The point I'm trying to make is that this is
14 not new knowledge that you developed. Any like UWB
15 engineer at that time. Not maybe any RF engineer, but
16 any UWB engineer at the time would have this knowledge,
17 correct?

18 A Can you ask the question again? I want to
19 make sure I'm totally understanding your question --

20 Q Sure.

21 A -- to give a proper answer.

22 Q The fact that there was this concern from
23 certain people that, hey, how is your UWB system going
24 to operate for Collision Avoidance when you're going to
25 get interference from my other RF systems is a concern



1 that an ordinary skilled UWB engineer would realize is
2 in fact not a problem?

3 MR. SCHODDE: Objection. Foundation.

4 THE WITNESS: So I can't necessarily speak
5 for everyone in that sense, but there is -- there is
6 two scenarios we're talking about here. One is you've
7 got Ultra-wideband transmitting and a concern about it
8 interfering with other systems. That is a low
9 probability unless you have really close proximity.
10 But then the other scenario is you have a conventional
11 narrowband or Spread-spectrum based system that's
12 transmitting at much higher power levels than
13 Ultra-wideband. And that is a more likely scenario of
14 interfering with Ultra-wideband. And the reason is
15 because Ultra-wideband is working effectively at
16 average power levels in microwatts. And you could
17 have -- and your cell phone is transmitting in watts.
18 So we're talking a tremendous difference in
19 transmission power. So there are situations that can
20 interfere and so you have to be very careful about that
21 and deal with that situation. But inherent in the
22 impulse Ultra-wideband system, it does have a
23 remarkable ability to handle interference from other
24 transmitters. But it's not foolproof.

25 Q Sure. Are you finished?



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1 A Yes.

2 Q But a UWB engineer would know that, right?

3 MR. SCHODDE: Objection. Foundation.

4 THE WITNESS: I've been stunned along the way
5 at people not knowing certain things. So I don't know.
6 I would hope people would, but I don't know. They may
7 not.

8 BY MR. WISNIA:

9 Q Okay, what about, let's say, the technical
10 folks that you spoke to at Time Domain, they would
11 know?

12 A Time Domain they are pretty smart people.
13 Most of those people had lived and breathed
14 Ultra-wideband for a long time in its heyday of early
15 development, but still being something that's a
16 laboratory concept. But even they had to go through a
17 shift because Ultra-wideband started out at lower
18 frequencies and they kept getting pushed up to higher
19 frequencies for some of these same concerns that we're
20 talking about here that there was concern about them
21 interfering with other systems, which may or may not
22 have been the case.

23 Q But the concern that you were able to address
24 in Paragraphs 39 and 40, the engineers at Time Domain
25 would have the same knowledge that you had and would



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1 know that you solve these problems, or A, that really
2 that they're not a problem.

3 MR. SCHODDE: Objection. Foundation. Form.
4 Hypothetical.

5 THE WITNESS: I could give you an example
6 where I was -- can I -- let me see. You would think
7 that, but when I looked at the Grisham Patent, and
8 that's Time Domain engineers, they weren't on the same
9 level of knowledge of the Time Domain engineers that I
10 worked with. I was kind of shocked at a couple of
11 things in their disclosure that they had that I would
12 expect an experienced radio engineer to think things
13 through a little bit more than that.

14 BY MR. WISNIA:

15 Q Let me ask you a more precise question then,
16 because the particular engineers that you dealt with at
17 Time Domain --

18 A Right.

19 Q -- they would know that these concerns that
20 you have addressed in Paragraphs 39 and 40 in your
21 Declaration, were not serious problems?

22 MR. SCHODDE: Objection. Foundation.

23 BY MR. WISNIA:

24 Q Correct?

25 A Number 40. There definitely is some concern



1 about that because Ultra-wideband operates in very low
2 power levels. So they knew about some issues with
3 that. So they would have said Number 39 from probably
4 that -- not much of a concern there, but 40 was always
5 a concern we had to deal with.

6 Q And how did you solve the problem differently
7 from how Time Domain had solved the problem?

8 MR. SCHODDE: Objection. Foundation.

9 BY MR. WISNIA:

10 Q If at all.

11 A I don't know if I did anything different or
12 not. I couldn't tell you because I don't know exactly
13 things that they did. I wasn't privy to those things.
14 I only know of my situation.

15 Q Okay. So in Paragraph 41 you say, "Some
16 engineers were apparently familiar with the limitations
17 of narrowband radio ranging in terrestrial
18 applications, likely having seen issues with poor
19 measurement accuracy and multipath phenomenon, which
20 may result in exaggerated distant measurements." Do
21 you see that?

22 A Uh-huh. I do.

23 Q Who are these engineers that were familiar
24 with these limitations?

25 A When I met with people and introduced them to



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1 our system that used time of flight ranging with
2 Ultra-wideband, sometimes they had concerns about it
3 working in challenging environments. And that probably
4 was because they had apparently had either personal
5 experience or had somebody demonstrate systems. And I
6 know there were people out there trying to do that.
7 Narrowband systems, using time of flight ranging. And
8 you get in, even a moderately challenging environment
9 where there's a lot of reflective surfaces, and your
10 system that seemed to be working wonderfully can turn
11 to garbage quite quickly. And so I think that was
12 their hesitation, because they weren't experienced with
13 or hadn't seen the power of impulse Ultra-wideband with
14 its wide bandwidth and also precise impulse time of
15 flight measurement timing.

16 Q I want to drill in on this a little bit,
17 which is, is this your belief that they saw this or
18 somebody actually told you, hey, I've seen issues with
19 poor measurement accuracy and multipath phenomenon in
20 narrowband radio ranging?

21 A I can't enunciate a particular statement that
22 was made to me. And this is going back several years,
23 actually, more than several years. So I can't really
24 tell you specific conversations, but I met with a
25 number of engineers at various transit agencies, and I



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1 know that multipath was something we talked about, and
2 I can't tell you exactly what they said. But I do
3 recall that multipath was a concern, and them not
4 having experience with Ultra-wideband and even really
5 fully understanding it, didn't see why that would
6 address things, perhaps for them. Okay, any RF
7 engineer knows multipath. Any decent RF engineer knows
8 multipath can be an issue. Even those of us who've
9 used FM radios have experienced multipath issues and AM
10 radios.

11 Q So in Paragraph 41 it sounds like what you're
12 saying is that to engineers in the field at the time,
13 there was a known problem of using narrowband radio
14 ranging for terrestrial applications. Is that right?

15 THE COURT REPORTER: What kind of
16 application?

17 MR. WISNIA: Terrestrial.

18 THE WITNESS: T-E-R-R-E-S-T-R-I-A-L. I'm
19 thinking.

20 BY MR. WISNIA:

21 Q Sure.

22 A I can't give you, like I said, a specific
23 recollection of any particular conversation, other than
24 I recall having conversations with these engineers
25 about multipath phenomenon. And my perception of my



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1 memory, and my memory perception is that they were
2 concerned about that. So I'm sorry I can't be more
3 specific on.

4 Q You know, earlier today I asked you some
5 questions about how you learned about UWB? And I think
6 you mentioned a trade magazine, is that right?

7 A I mentioned two trade magazines I recall.
8 EDN, which I believe stands for Electronic Design News
9 and Electronic Design. Those were both trade magazines
10 that I've read probably throughout my entire career. I
11 haven't been actually reading them as much in recent
12 times. Unfortunately, I just haven't found as much
13 utility in them. But they were very instrumental in my
14 early and mid career in terms of gaining knowledge of
15 not only conventional existing technology, but also
16 some budding new technologies and concepts.

17 Q Are there other kinds of journals that people
18 kind of turn to in this space that are kind of like
19 good sources of information?

20 A Well, there's IEEE spectrum. The thing with
21 IEEE spectrum is it's more on the research side of
22 things. So you might be reading something that isn't
23 realizable for some time. It might take decades before
24 it actually can be commercialized. There are various
25 limitations that can come to play. I mean there's RF



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1 Design Magazine. I also read that. RF and Microwave
2 Journal, I believe that's the name of it. I also read
3 that. A lot of that was above me, because it was
4 people in the industry, experts in the industry, that
5 did a lot of things that I wasn't familiar with.

6 So these are all sources to get some
7 insight. The funny phenomenon, though, with
8 Ultra-wideband, and I still see it. I've seen it in
9 the last several months, and that is, people confuse,
10 when they see Ultra-wideband, they don't realize the
11 separation in impulse and --

12 Q Data communication?

13 A -- yeah, the data communication. There's
14 maybe another word to use to describe that. And so
15 they conflate or they confuse those two types of
16 scenarios, and they'll make statements about how to use
17 Ultra-wideband, and they're talking in the wrong space.
18 And these are people who you would think know better,
19 but the problem is, when they're reading literature,
20 they don't realize they're reading about a different
21 flavor of Ultra-wideband that is quite different. And
22 so, even literally within the last six months, I have
23 seen that still pervasive in the industry. It's unlike
24 anything I've seen anywhere else, where it's stunning
25 how, after all this time, it's still not clear to a



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1 surprising number of people.

2 Q Have you worked with Parsons Transport Group?

3 A Yes.

4 THE COURT REPORTER: Sorry. I can't hear
5 you, Counsel. Have you worked with?

6 MR. WISNIA: Parsons Transportation group?
7 P-A-R-S-O-N-S.

8 THE WITNESS: Yes, we partnered with Parsons
9 at least as early as 2016. I think it was somewhere in
10 that area. Perhaps Mr. Markey can clarify that better
11 because he would know more of that side of the aspect
12 there. But when we were working with the MBTA in
13 Boston, they required a bonding agency. And so we
14 ended up partnering with Parsons Technology or Parsons
15 Transportation Group in our proposal. So we worked
16 very closely with them. First, we had to convince them
17 that we were a viable solution. And then we worked
18 with them to make a proposal to the MBTA for the Green
19 Line Train Protection System. Sorry.

20 Q And what were you going to deliver, you,
21 being Metrom, under that arrangement and what was
22 Parsons going to deliver?

23 A Parsons was going to be essentially the
24 general contractor in that, is my understanding. And
25 we would be the primary technology provider. So we'd



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1 be providing much of the equipment. There might be
2 some aspects that Parsons might have sourced that was
3 more conventional of the train control arena, but it
4 was primarily us providing the Ultra-wideband and Train
5 Control Solution to custom design for that application.

6 Q And was that application for MOWs or was it
7 like for commuter trains?

8 A It was going to probably be on both. And the
9 reason why is that you could have collisions with
10 anything that's out there on the tracks. And the
11 conventional CBTC systems that train lines were using
12 were not practical to put on Maintenance of Way
13 equipment. So what we were offering to them was a way
14 that they could have both Maintenance of Way equipment
15 and their trains using technology for Collision
16 Avoidance and they would be able to detect each other.

17 Q And, I mean, do you have a sense of how big
18 Parsons is?

19 A They're big. They're a very big company.
20 They do massive projects at various places. I know
21 they worked on the O'Hare Expansion of the people mover
22 there as well. So I'm aware they're a very large
23 company.

24 Q Thousands and thousands of employees?

25 A I would believe that.



1 Q And did David Garcia work with you or was he
2 involved in this Boston project you're talking about?

3 A Yes, he was. I cannot tell you exactly when
4 he arrived on the scene, because there is -- for two
5 reasons. One, because there has to be an event that
6 helps you trigger that because otherwise it's not
7 remarkable at the time. People come and go. There was
8 various people from Parsons that came and went along
9 the way. And so I couldn't tell you with definitive
10 idea of when I first met them necessarily and when they
11 disappeared from the scene. David, though, is
12 remarkable in that I remember him for a couple of
13 reasons. One, he was a fairly young guy and he was
14 pretty new to the industry. So he was a bit green in
15 that respect, but he also was a pretty sharp guy. And
16 so he kind of gets your attention because he's a smart
17 guy and you can tell he's going to go places.

18 So the other thing that also was
19 remarkable with David is that because we were
20 partnering with Parsons, we had to work very
21 cooperatively with them and we had to overcome their
22 concerns about whether we really had a viable product.
23 And so David spent a decent amount of time at our
24 facility observing our devices and he saw us out in the
25 field, I believe, both with MBTA as well as in New York



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1 City Transit during some of the POCs. I believe he was
2 in those as well. And in fact, to give you an example
3 of how integrated we were with David Garcia, David
4 Garcia and another individual, Sarah Woitel, who worked
5 for me, copresented at the Next-Gen Rail Conference in
6 2017, I believe it was. That would be the fall of
7 2017. And they both copresented on Ultra-wideband in
8 rail transit as a potential solution for that. Neither
9 Sarah or David had really any background in
10 Ultra-Wideband. Their presentation material was
11 provided by me. I was mentoring both of them in
12 preparation for that presentation. And that sticks
13 with you, because when I look at that presentation that
14 he did, I recognize the source material because I
15 provided it. I'm the one that actually created those
16 drawings, for example, for previous presentations that
17 I had made.

18 And so then when David -- we found out
19 that David was going to an Ultra-wideband competitor
20 for us, that obviously was a shocking occurrence,
21 because I felt like we had a really good working
22 relationship with him and had even mentored him in
23 Ultra-wideband.

24 Q So you're 100 percent certain that you worked
25 with Mr. Garcia in connection with the Boston, not New



1 York Project?

2 A Am I 100 percent sure in Boston? I'm not 100
3 percent sure he worked with us at all in Boston. The
4 problem is Boston and New York City overlapped a little
5 bit. And so it's hard for me to discern whether it was
6 both of those. I know he was part of the New York City
7 transit side of things, but I also know he was in our
8 offices before we were doing anything with New York
9 City Transit, because that was how we got the transfer
10 of knowledge to him. So he could do that conference
11 presentation at Next-Gen.

12 Q What is the date of when he first arrived at
13 your office?

14 A It had to have been -- it would have had to
15 have been if I had the date of the Next-Gen, correct.
16 That was in like October maybe or November of 2017. It
17 had to have been sometime before that that I had some
18 interaction with him. But I don't remember a specific
19 timing of that. If I have the date wrong, it ends up
20 being it was 2018 that was the Next-Gen that he made
21 the presentation at, then that throws off those dates
22 there. But I thought it was in the fall of 2017. That
23 was the Next-Gen that he and Sara made the presentation
24 at.

25 Q All right. So let me ask you again, sir.



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1 A Yeah.

2 Q Yes or no, you're 100 percent sure that David
3 Garcia was -- that you worked with him during the
4 Massachusetts, not New York, Project?

5 MR. SCHODDE: I have a clarification. During
6 or in?

7 BY MR. WISNIA:

8 Q Well, let me ask you a new question, sir.

9 Yes or no, you are 100 percent sure that
10 you met David Garcia during your work in connection
11 with the Massachusetts as opposed to New York Project?

12 MR. SCHODDE: Objection to form.

13 THE WITNESS: I would not be able to say that
14 with absolute certainty because I can't remember the
15 exact timing of when I first worked with him. The only
16 anchor I have is the Next-Gen presentation that they
17 made that he could not have made if he had not had
18 interaction with Metrom Rail, because the material that
19 he used came from only one person and I know who that
20 person is because I am that person.

21 BY MR. WISNIA:

22 Q Okay. And you mentioned another person, Sara
23 somebody?

24 A Sara Woitel.

25 Q Does Ms. Woitel still work with you?



1 A Woitel is W-O-I-T-E-L. She does not. She
2 was also laid off around the time of the layoff that
3 Cygnus was impacted with.

4 THE COURT REPORTER: Your voice went down.

5 THE WITNESS: She was also laid off around
6 the same time that Cygnus was laid off that I mentioned
7 earlier.

8 BY MR. WISNIA:

9 Q How much time do you think, in total, you've
10 spent with Mr. Garcia?

11 A Can you define "spent with him"? You mean in
12 terms of calendar time that I was interacting with him?

13 Q Yeah. I mean, in other words, you and I have
14 spent several hours together. I don't know if it was
15 five and a half or seven and a half or whatever it is,
16 but I would say if somebody asked me how much time have
17 I spent with Mr. Gunther, I'd say we spent several
18 hours with him one day. So on that level, I'm going to
19 ask you, sir. Let me ask you a new question, okay?

20 A Yes.

21 Q So my question is, how much time have you
22 spent with Mr. Garcia?

23 A It was at least five or six months, I think,
24 interacting with him in New York City Transit. And
25 that would have been during 2018. Prior to that, I



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1 can't tell you with any certainty how much time that
2 would have been. But I do remember him being at our
3 facility. I just can't pinpoint the exact timing of
4 that. And as I said before, the material that he
5 presented at Next-Gen came from me. So it would have
6 to be a miracle for him to have that material without
7 having some interaction.

8 Q So how much time did he spend at your
9 facility?

10 A I had multiple things going on at the time,
11 multiple developments going on, a growing staff. So I
12 can't tell you exactly because there was nothing
13 remarkable about it. I just know that he was at our
14 facility. He had the full run of our facility. He saw
15 our stuff. He asked questions at some point along the
16 way about our things that we were doing. He saw our
17 equipment at demonstrations. He saw everything that
18 was going on. He's familiar with the procedures we
19 were following. He was immersed in it as much as
20 anybody.

21 Q So my question again, sir, is how much
22 time --

23 A I don't know.

24 Q Hold on, let me finish. How much time did
25 Mr. Garcia, spend at your facility?



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1 A I don't know.

2 Q Was it more than one day?

3 A I don't know for certain.

4 Q When he was at your facility, did you spend
5 more than minutes with him?

6 A It had to be more than single digit minutes,
7 because, again, I don't know how he would have gotten
8 the information that I conveyed to him.

9 Q So how much time?

10 A I don't know. It was nothing remarkable at
11 the time.

12 Q Okay. Now, you say he had "the run of the
13 place". What does that mean?

14 A He was not treated as if he was a visitor.
15 He was a collaborator. He's part of a company we are
16 cooperating with that was a partner. So he was treated
17 as if he was one of us in that sense.

18 Q I want to distinguish for a second between
19 the Massachusetts Project and the New York Project,
20 right? The relationship between your company and
21 Parsons was very different between those two projects,
22 correct?

23 A That is correct.

24 Q Okay. In the Boston Project, you guys were
25 working side by side in delivering something to Boston,



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1 correct?

2 A That is correct.

3 Q And in the New York project, Parsons was
4 acting on behalf of New York, not your partner,
5 correct?

6 A That is correct.

7 Q Okay. What was the role of Parsons in the
8 New York project?

9 A My recollection of what Parsons was doing,
10 and I don't know because I'm not privy to their
11 contract. It's only what I experienced or saw. But
12 they worked with us in coordinating demonstrations,
13 proof of concept activities that we were doing in terms
14 of coordinating meetings. And sometimes we would
15 answer questions that they had about aspects that they
16 were doing, because I think they were evaluating our
17 work. And in evaluating our work, we had to show them
18 our work product that we were doing. So even though
19 the legal relationship was different, it didn't feel
20 that much different to me because we were still working
21 with them and they still were seeing what we were
22 doing.

23 Q And so in the New York project, the Parsons
24 role was much more like what one may call a project
25 management role. In other words, facilitating



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1 meetings, facilitating interactions, facilitating.
2 Getting both groups together for testing, things of
3 that nature.

4 MR. SCHODDE: Is that a question?

5 THE WITNESS: Yeah.

6 BY MR. WISNIA:

7 Q Correct.

8 A I don't think that necessarily sums up all of
9 it, because there was also other project managers at
10 New York City that I interacted with, and I interacted
11 with David closer than I did with his other
12 individuals.

13 Q And --

14 A As an example, a demonstration I did at New
15 York City, David sent me videos of that demonstration.
16 No other project manager at New York City Transit did
17 that with me. He knew me personally.

18 Q Do you think that -- well, first, let me just
19 ask you plainly is Mr. Garcia a thief?

20 A I don't know if he's a thief or not.

21 Q I mean do you believe in him to be a thief?

22 MR. SCHODDE: Objection to form.

23 Argumentative.

24 THE WITNESS: Have I seen him steal something
25 from me physically? No.



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1 Q Well, I mean, you know why I'm asking the
2 question, right?

3 A Yes.

4 Q So my question, sir, is, do you believe
5 Mr. Garcia is a thief?

6 MR. SCHODDE: Objection to form.
7 Argumentative and theatrical.

8 THE WITNESS: And my answer is, do I know
9 that he stole something physically from me? The answer
10 to that is no. But when I look at the helix system
11 sold by Piper, a lot of elements in that look strangely
12 familiar to a product that I developed at Metrom Rail
13 that he was intimately familiar with in his interaction
14 with us at Metrom Rail.

15 BY MR. WISNIA:

16 Q And so you believe Mr. Garcia took the
17 knowledge that he learned from you and wrongly
18 incorporated it into Piper's product, is that what
19 you're saying?

20 A I don't know what he did, because I wasn't
21 there to witness it. But what I can tell you is, I
22 highly doubt that he forgot everything he learned in
23 dealing with us when he went to Piper.

24 Q I'm just looking for your belief, sir. I
25 understand you've seen certain things. You haven't



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1 seen certain things. So simply, do you believe, you,
2 Mr. Gunther, believe that David Garcia took the
3 knowledge he learned from you and wrongly used it in
4 the Piper products?

5 MR. SCHODDE: Objection to form.
6 Argumentative.

7 THE WITNESS: I don't know how to answer that
8 because I don't know what actually happened. All I can
9 tell you is what I have observed and that no other
10 company has produced a product with so much in common
11 with our Collision Avoidance system, except the company
12 that a short time prior had hired David Garcia, who had
13 a lot of this knowledge. I cannot prove it. I could
14 not prove it in a court of law with what I have
15 physically observed.

16 BY MR. WISNIA:

17 Q Let me ask you. From what you told me today,
18 it sounds like you feel like you have a good sense of
19 people and you're able to read people. It's come up
20 multiple times today. You've spent time with
21 Mr. Garcia, some in person, some remotely, over what
22 you've told me is many months. What's your read on
23 him? Do you believe he's an honest or a dishonest
24 person?

25 MR. SCHODDE: Objection to form.



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1 THE WITNESS: Personally, I have a very high
2 regard for David Garcia. He's a sharp guy.
3 Professionally, I gave him and my staff gave him a lot
4 of knowledge. And I find it hard to believe that that
5 knowledge was wiped away from his brain and it wasn't
6 applied in what he did later. And the reason is
7 because it's stunningly similar, what I see, even some
8 terminology that I see in material from Piper.

9 Q In Paragraph 46 of your Declaration you
10 mentioned that Mr. Garcia's role was of a lead project
11 manager. Do you see that?

12 A Yes.

13 Q Was he a design engineer on that project?

14 A On which project?

15 Q On the New York, the MBTA project.

16 A He was not a design engineer that I'm aware
17 of.

18 Q And so --

19 A But I don't know what his exact defined role
20 was because I wasn't privy to his contract and his
21 defined role. That's not documentation that I was
22 privy to. I only know what I observed working with
23 him.

24 Q What information would Mr. Garcia have
25 available to him from what you suggest to be his



1 unrestricted access to the Aurora system that he
2 wouldn't have, for example, by reading the 227 Patent
3 or the 131 Patent?

4 A Anyone who has ever read a patent knows that
5 it doesn't give you implementation details to the Nth
6 degree. So he certainly would have more details
7 because he actually saw our system in operation. He
8 was there when we were demonstrating things. But even
9 before we're demonstrating things, he was part of
10 conversations and evaluating what we were going to do.
11 He was likely privy to test plans that went into
12 various features that we were implementing and
13 designing and testing, presenting, and he was part of
14 that evaluation and probably evaluating our performance
15 in terms of achieving those things. So reading a
16 patent, you're just reading something at arm's length.
17 He was immersed in what we were doing.

18 Q So can you identify for me the specific
19 implementation details that you've seen in the Helix
20 system that you believe he took from the AURA system
21 that are not found in the 131 or the 227 Patents?

22 A I guess I'd give it a shot. I would prefer
23 to use their most recent brochure that I saw at
24 Next-Gen 2023 version of their Helix system. That
25 Helix is what you're -- did you say Helix?



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1 Q I did say Helix.

2 A So the 2023 Helix brochure because some of
3 the earlier material they had was a little less detail
4 rich. And even still, they're not really as detail
5 rich as would be useful for your question to be able to
6 answer it better.

7 Q So go ahead. Please do your best.

8 MR. SCHODDE: Would you like to take a break,
9 because I can probably get that brochure for you?

10 MR. WISNIA: No. I'm not looking to
11 introduce new exhibits, not looking for new testimony.
12 I'm looking for -- you made allegations in this
13 document. Yes, I'd like to talk about that.

14 MR. SCHODDE: You don't want to --

15 THE WITNESS: To have material because you
16 asked me to compare to --

17 BY MR. WISNIA:

18 Q What I'm asking you for is you make -- well,
19 let me ask you the question.

20 Can you identify for me any particular
21 implementation detail that you believe Mr. Garcia took
22 from you and put in the Helix system that's not in the
23 131 or the 227 Patent?

24 A From memory, no. I'm not going to even try,
25 because I'd be speculating that. And then you could



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1 say it's not even part of the brochure, or they're not
2 part of what they revealed. So that would put me at a
3 disadvantage. So I would not be willing to do that. I
4 would want to have material in front of me in order to
5 do that. Because I'd have to go from memory. That
6 would be an unfair disadvantage for me and an advantage
7 for you.

8 Q Well, I mean, you had all the time in the
9 world to prepare your Declaration, and if you felt like
10 you needed further support for what you said, I would
11 imagine you would have looked at things?

12 A No, you're assuming I have perfect memory,
13 but I don't. So I'd have to look at that. I wouldn't
14 expect somebody to do a feature comparison without
15 being able to look at the feature set. And that's what
16 you're asking me to do, so I consider that
17 unreasonable. So I won't until I have the ability to
18 do it properly.

19 MR. SCHODDE: We also asked for some
20 discovery of Helix and you opposed that motion and
21 prevailed. So it seems a little ironic that you're now
22 criticizing him.

23 MR. WISNIA: Well, I'm asking him based on
24 what he's saying here.

25



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1 BY MR. WISNIA:

2 Q And so here's my question. Well, let me
3 start. You didn't include in your Declaration any sort
4 of comparison, right?

5 A No, I did not.

6 Q Okay. And you --

7 A I didn't think so.

8 Q I think that's correct, but go ahead and if
9 you think it's up somewhere, you let me know.

10 A I don't believe I did put any detail in the
11 Declaration to that.

12 Q Okay. And, you know, we're saying in your
13 declaration, hey, here are particular implementation
14 details that I believe Piper or Mr. Garcia copied,
15 right?

16 A Correct. I don't provide that detail.

17 Q Okay. Take a look at Paragraph 48 of your
18 Declaration. Read that to yourself and tell me when
19 you're ready.

20 A Okay. I have read Paragraph 48.

21 Q All right. You say, "I have reviewed the
22 Declaration that Mr. Andrews submitted for the
23 interparty review, particularly the background section.
24 What Mr. Andrews does not acknowledge is that prior to
25 AURA CAS, no one had deployed a commercially successful



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1 terrestrial radio ranging based Collision Avoidance
2 system in the railroad industry despite every
3 motivation to reduce expensive MOW accidents."

4 Do you see that?

5 A Yes.

6 Q And you have that under a heading that says
7 "Other Failed Industry Attempts."

8 Do you see that?

9 A Yes.

10 Q What specific failed industry attempt are you
11 talking about?

12 A Well, when we were doing our demonstration
13 with CN, there clearly was some prior device that they
14 had had. I'm not sure who it was they were using,
15 because they didn't have it there at the time. I do
16 know of a company that I can't remember the name of the
17 company that was acquired by Harsco that was attempting
18 to compete in the same space. In fact, in the
19 tradition of copying, they had a promotional video that
20 they did that they copied the video. If you looked at
21 the text of the narration, just substitute their
22 product for our product and change a couple of minor
23 words and it was the same thing. It was a blatant
24 copy. But they also had a system that they were
25 targeting for Maintenance of Way. I can't remember the



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1 name at the moment, but never ran into problems with
2 competing with them. My understanding was it had
3 failed pretty badly in its implementations. So that's
4 an example of what I'm talking about here.

5 Q So you said that CN clearly had a previous
6 system, but earlier --

7 A No, what I said was, they clearly had someone
8 demonstrate something for them and they took us to that
9 same location, because I could tell that this was a
10 familiar location. To a guy that didn't live anywhere
11 near that, he was six hours away from where he lived.
12 And he doesn't ride out there on the rails. He sits in
13 an office. Yet he was very familiar with that
14 location. He had been there before and seen someone
15 fail before. Okay, that's what I was saying.

16 Q You're talking about the fellow you referred
17 to as the decision maker in your Declaration?

18 A Yes.

19 MR. WISNIA: All right. Where are we on
20 time?

21 MR. SCHODDE: You're at about an hour.

22 MR. WISNIA: Okay, why don't we take a break?

23 THE VIDEOGRAPHER: Going off the record at
24 4:05 p.m.

25 (BRIEF RECESS)



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1 THE VIDEOGRAPHER: Going on the record at
2 4:19 p.m.
3 BY MR. WISNIA:
4 Q Sir, you understand you're still under oath?
5 A Yes, I do.
6 Q You gave me the number earlier and I forgot
7 it. The most recent version of the product that you
8 guys use is the P440?
9 A P440.
10 Q Okay. And is that now being supplied to you
11 by Humatics?
12 A No.
13 Q Who supplies you with that?
14 A We haven't purchased any more P440s for a
15 while. Once Humatics -- at some point after Humatics
16 acquired Time Domain, they became hostile towards us
17 and decided they weren't going to sell us product
18 anymore.
19 Q Okay. So what are you doing? How are you
20 getting the product?
21 A Well, fortunately for them, we had plenty of
22 inventory. So we've been able to live off that
23 inventory.
24 Q Okay. Do you think they got hostile to you
25 because you sued them?



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1 A No, this is before that.

2 Q Okay.

3 A No, it was well before that. They got
4 hostile shortly after we finished our proof of concept,
5 sir.

6 Q I'm going to ask you to turn to Exhibit 1050.
7 I gave this to you a long time ago.

8 A Where did mine go? Greg's hoarding it right
9 there.

10 MR. SCHODDE: Okay, there's an extra.

11 (WHEREUPON Exhibit 1050 was marked
12 for identification)

13 BY MR. WISNIA:

14 Q All right. What is Exhibit 1050?

15 A What is Exhibit 1050? Yes, it is a list of
16 Metro Rail Patents. The patent number and the patent
17 name or description.

18 Q Okay. Do you know which one of these ones
19 you're an inventor on?

20 A All but one, I believe.

21 Q Okay. Do you know which one you're not an
22 inventor on?

23 A It might be the 589, which is probably -- I'm
24 not certain, though.

25 Q Okay. There's a series of patents here that



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1 are entitled "Worker Protection System". Do you see
2 that?

3 A Yes.

4 Q It's like the 595. I'm just reading the last
5 three digits.

6 A Yes.

7 Q The 595 Patent and the 709 Patent?

8 A Yes.

9 Q As well as the 353?

10 A Yes.

11 Q Okay. Do those patents relate to Maintenance
12 of Way Collision Avoidance?

13 A Depends on your definition of Collision
14 Avoidance, if you consider colliding with a Worker
15 Collision Avoidance. So I guess it depends. I hate
16 that answer, but I'm sorry.

17 Q Okay. Does the AURA system use any of the
18 technology from these Worker Protection Patents?

19 A I would have to look at those to see because
20 there might be one or two that has some things in
21 common with it. I'm not certain, though. It's been a
22 while since I had looked at those patents.

23 Q Does the AURA MOW Collision Avoidance system
24 use the technology from any of the patents on this list
25 except for the 131 and the 227 Patents?



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1 A Well, given that they came -- this looks like
2 this list is pretty much chronological or close to it.
3 There might be one that's out of order here in terms of
4 issuance and application is relatively correlated with
5 that. Since 227 and 131 are at near the top of the
6 list or earlier in the list, it makes it unlikely
7 they'd be using anything in there just by that reason.
8 797 is a completely different item. So there's no
9 relationship between 227, 131 and the 797. So I guess
10 my answer would probably be no.

11 Q Go ahead. Maybe my question wasn't clear. I
12 may have misworded it. Not does the 227 and 131 Patent
13 use these other patents. My question is, does the AURA
14 CAS system use any of these other patents?

15 A Oh, I'm sorry. I misunderstood you. The
16 AURA system is based off of the 227, 131 Patents.
17 There may have been some capabilities incorporated or
18 mentioned in some of the later patents. So you could
19 say there's some relationship, but the AURA system was
20 based off of the 227, 131 Patents.

21 Q Okay. Does the AURA CAS system use or
22 include GPS RTK high precision position and speed
23 calculations for limits, compliance and time
24 synchronization to communicate Maintenance of Way
25 location and vehicle work limits with submeter



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1 accuracy?

2 A The 131 and 227 Patents were done at a time,
3 I think, before RTK was a thing. But if RTK is
4 including auxiliary ground based systems to improve
5 precision, then that is mentioned in the 131, 227
6 patents, as well as work limits, I believe is also
7 mentioned in there. So there is some aspects of that
8 that are covered in those patents.

9 Q My question was specific to the AURA CAS
10 system. And you answered with the patent.

11 A I'm sorry. I thought you were talking
12 about -- I'm confused. Ask your question again,
13 please.

14 Q I will. Does the AURA Collision Avoidance
15 system include GPS, RTK, high precision position and
16 speed calculation for limits compliance and time
17 synchronization to communicate Maintenance of Way
18 location and vehicle work limits with submeter
19 accuracy?

20 MR. SCHODDE: Objection to form. Confusing
21 and foundation.

22 THE WITNESS: So AURA uses GPS and gives you
23 a ground speed from that. And the operator can also
24 view GPS coordinates. So the operator could determine
25 where they're at relative to that. But there's not a



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1 display that would say you're at your defined limit
2 that I'm aware of.

3 Q What about for --

4 A I'm done. That I'm aware of at the moment.

5 Q What about for time synchronization?

6 A I need to understand the time synchronization
7 question more.

8 Q Let me ask you, does the AURA CAS system use
9 GPS, RTK, high precision calculations for time
10 synchronization when it communicates Maintenance of Way
11 location and vehicle work limits?

12 A It does use GPS based time for recording of
13 data that provides location.

14 Q Does the AURA CAS system use LIDAR?

15 A The AURA system does not use LIDAR.

16 THE COURT REPORTER: What is the word you're
17 saying?

18 THE WITNESS: L-I-D-A-R. All capitals.

19 L-I-D-A-R.

20 BY MR. WISNIA:

21 Q Okay. So it's fair to say that the AURA CAS
22 system therefore does not use LIDAR for obstacle
23 detection and redundant position and speed calculation,
24 correct?

25 A That would be an accurate statement, yes.



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1 Q Okay. And does the AURA CAS system compare
2 real time imaging from LIDAR to an onboard database?

3 A No.

4 Q How about constantly surveying the tracks
5 using a detailed model of the territory to
6 independently calculate the vehicle's position?

7 A No.

8 Q Does the AURA CAS system have an onboard
9 inertial measurement unit to provide operational
10 telemetry data to alert operators instantly to
11 collisions?

12 A It does include inertial sensing that can
13 detect if there was a collision and log the time, date,
14 and location of the event.

15 Q Does it immediately alert operators to such
16 collisions?

17 A No, it doesn't. Generally, the operator is
18 aware of collision.

19 Q Does the AURA CAS system have high definition
20 cameras?

21 A It does not.

22 Q Does it deliver live video from each vehicle?

23 A No.

24 Q Does the AURA CAS system use iDR? That's
25 i-D-R?



1 A To be honest, I don't know. I can't answer
2 the question because I'm not sure I know what that is.
3 The acronym is not familiar to me, and if I don't know
4 what it is, I can't give you an honest, good answer.

5 Q Fair enough. But we already clarified that
6 LIDAR is not being used in the AURA system?

7 A Yes.

8 Q Does the AURA CAS system have advanced
9 infrastructure management to integrate third party
10 dispatch systems for remote monitoring and managing of
11 vehicles?

12 A Could you read that again, please?

13 Q Sure. Does the AURA CAS system have advanced
14 infrastructure management to integrate third party
15 dispatch systems for remote monitoring and managing of
16 vehicles?

17 A Not currently. There was some implementation
18 of that on an experimental basis some years ago.

19 Q Does the AURA CAS system have an employee in
20 charge tablet interface to monitor vehicles and limits
21 in real time?

22 A No.

23 Q I want to go back to the question of the
24 advanced infrastructure management to integrate third
25 party dispatch systems for remote monitoring and



1 managing of vehicles. You said at some point you were
2 working on it, or maybe there was an experimental
3 version, is that right?

4 A Yes.

5 Q When was that?

6 A It would be in the 2017/2018 time frame.

7 Q And what project was that in connection with?

8 A We called it "productivity", which is
9 basically giving a window to the location and activity
10 of work equipment back to the central office.

11 Q Was that ever delivered to any customer?

12 A There was field trials with the equipment.

13 Q With whom?

14 A I believe that was Canadian National. I'm
15 not absolutely certain, but I believe that's who it
16 was.

17 Q Sir, earlier today I asked you about
18 ownership in the Metrom Rail Company. Do you
19 personally have any ownership interest in the company?

20 A No.

21 Q Do you have any sort of stock options or
22 things of that nature?

23 A No.

24 Q We talked earlier about several people, and
25 you mentioned that there was a period of time where



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1 there were layoffs?

2 A Yes.

3 Q What time period was -- I think you told me,
4 August 2020?

5 A August 2020, yes.

6 Q Okay. What was the reason, if you know, for
7 why there were layoffs at the time?

8 A Insufficient business, obviously, to support
9 the staff. I don't know what more I can say.

10 Q Okay.

11 A That's basically the reason why people are
12 laid off, because there's insufficient business to
13 support the --

14 Q Okay. Was that around the time that you guys
15 bid on but not win the MTA contract?

16 A I believe it was somewhere in that time
17 period, yes.

18 Q Okay. Do those things relate to each other
19 at all, this bidding on the MTA contract and the layoffs
20 that you guys had to do?

21 A That was certainly -- I would think that
22 would be a part of the decision, but I wasn't the
23 decision maker. So that would really be a question for
24 Mr. Markey.

25 Q Okay. And this is somewhat of a personal



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1 question, but I apologize. Would you have earned some
2 sort of bonus if you guys had won this MTA contract?

3 A I wasn't expecting one. I would have eagerly
4 accepted one. None had been promised to me for that.
5 I wouldn't have been surprised. I would have been
6 pleased.

7 Q And just as earlier we agreed we're going to
8 redact your address. I'm going to ask you this
9 question, and if your Counsel wants to, I'm happy for
10 it to be redacted in the transcript as well. Which is,
11 can you tell us roughly how much money you've made
12 during your employment at Metrom?

13 A May I understand why that is a necessary
14 question? That is actually a very personal question.

15 Q I agree. It is a very personal question.
16 That's why I'm going to agree to redact it. I'm happy
17 to tell you why.

18 A I would like to know the reason.

19 Q Sure. It's a fair question.

20 A That's a rather invasive question.

21 Q I agree with you. It's a personal question.
22 It's an uncomfortable question. And I'll tell you why
23 I'm asking it.

24 A Okay.

25 Q Which is when a fact finder, a judge, jury,



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1 an examiner, a patent office person, is considering
2 testimony of people, they consider various factors in
3 deciding whether or not they think they're being
4 truthful or not. One of the things that they consider
5 is there is some sort of financial interest or some
6 sort of financial arrangement with respect to the
7 witness. That's just one of the factors. They're
8 going to consider all different factors. That's why I
9 asked the question.

10 A Am I allowed to talk to my Counsel about this
11 question?

12 Q I mean, it's not a privileged question. If
13 he's not going to let you answer it, he would have told
14 me by now.

15 MR. SCHODDE: I do have an objection to
16 relevance. He started in 2011. You're asking for his
17 running total of his salary for the last --

18 MR. WISNIA: It's fair enough. Why don't I
19 ask a more precise question? Fair enough.

20 BY MR. WISNIA:

21 Q Why don't we start with 2017, which I think
22 is when we're talking about this Massachusetts one from
23 2017 forward, and you could tell us by year or however
24 you want to, whatever is easiest.

25 A So what you're looking for is what my annual



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1 salary was?

2 Q Yeah. Salary and bonus. I don't care about
3 health care, things like that.

4 MR. SCHODDE: And I would like the answers
5 redacted from the public file, personally --

6 MR. WISNIA: I agree.

7 MR. SCHODDE: -- identifiable information.

8 THE WITNESS: 2017. As you may know, after
9 we completed the proof of concepts with New York City
10 in December of 2018, there was no more contracts for
11 Metro Rail with New York City Transit. And I would
12 have difficulty telling you with exact precision of
13 this, but roughly from about that time, 2019 until now,
14 my pay has been the same every year. I have not
15 received a pay increase.

16 BY MR. WISNIA:

17 Q Okay.

18 A Because the company has been in financial
19 stress as a result of the conditions. So my salary for
20 that -- each year for that period was \$140,000 a year.
21 No bonuses. The prior year, 2018. There's some
22 imprecision in my answer because I can't remember the
23 exact dates, but I believe there was a -- there was a
24 bonus given to me the prior year. I believe that I
25 actually reduced so that an employee would get a larger



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1 bonus. So my bonus, I think, was \$9,000 on top of, I
2 think I was making like 135K that year. Again, these
3 are imprecise. So that's 2018. And 2017 was the
4 starting year, you asked?

5 Q Yes, sir.

6 A And I think 2017 it was probably 130. And
7 there may have been a smaller bonus that year several
8 thousand dollars.

9 Q Okay. I appreciate that. In the period of
10 time that you've worked at Metrom Rail, what's the most
11 number of employees you've had and how many do you
12 currently have?

13 A Can I use a post-it note?

14 MR. SCHODDE: Beyond the scope. Relevance?
15 I think you're doing discovery in the District Court
16 Case.

17 THE WITNESS: Including contractors?

18 BY MR. WISNIA:

19 Q I would exclude contractors. Employees of
20 the company. I mean unless you tell me you regularly
21 relied on contractors for all the time.

22 A No, it was sporadic. I believe the peak of
23 full-time regular employees. I had 17 reporting to me,
24 approximately. And how many do I have now reporting to
25 me, you're saying?



1 Q I meant the whole company, but I know you've
2 only counted reporting to you for now, so why don't you
3 finish by saying how many are reporting to you now?

4 A So, reporting to me is a little bit amorphous
5 at the moment, because at least one of these employees
6 has dual duties. So it's nebulous to say he solely
7 reports to me to be accurate, but two.

8 Q Okay. And roughly for the whole company.
9 And order of magnitude is kind of what I'm looking for.
10 How many went to peak and how many now?

11 A I would say 25, probably at the peak, full
12 time employees. I'm sure I'm forgetting somebody.
13 Sorry. Six currently full-time employees. And there
14 is a contractor who is essentially a full-time
15 employee. So you could say seven.

16 Q Okay. And is the change -- did most of it
17 happen around this August 2020?

18 A Ninety-five percent of it happened at -- 90.
19 95 percent at August '20.

20 Q Okay. Why don't we take a short break? I
21 think I'm done, but I just want to spend a couple of
22 minutes referring with counsel and then come back and
23 I'll finish up and you can do your part.

24 THE VIDEOGRAPHER: Going off the record at
25 4:47 p.m.



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(BRIEF RECESS)

THE VIDEOGRAPHER: Going on the record at
04:56 p.m.

BY MR. WISNIA:

Q Sir, you understand you're still under oath?

A Yes, I do.

Q Okay. Sometimes in a deposition, you've got
a lot of questions, you've got a lot of answers. It's
a lot of time. Sometimes in deposition people say to
themselves, oh jeez, he asked me a question earlier in
the day that I wish I would have said something
different or I wish I would have said this or that. So
now's your chance. Would you like to amend or
supplement or change your testimony at all?

A I already gave an amendment earlier on that
topic. I don't know of anything more that I want to
amend. I can't think of anything else.

MR. WISNIA: Okay, well, thank you for your
time today. I appreciate it. I pass the witness.

MR. SCHODDE: Thank you. I will have some
redirect. I'm going to go off the record for a few
minutes.

MR. WISNIA: Okay. Let's go off the record.

THE VIDEOGRAPHER: Going off the record at
4:57 p.m.



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(BRIEF RECESS)

THE VIDEOGRAPHER: Going on the record at
5:06 p.m.

EXAMINATION

BY MR. SCHODDE:

Q Mr. Gunther, do you recall talking with
Petitioner's Counsel regarding a conversation with
Dr. Kuklev?

A Do I recall talking to him?

Q During the questioning?

A Yes.

Q Regarding that conversation, what was the
purpose of that discussion?

MR. WISNIA: Objection. Outside the scope.

BY MR. SCHODDE:

Q You can answer.

A He called to ask me a couple of questions
about the AURA system is my recollection.

Q And a conversation with Dr. Kuklev, did you
reach any conclusions regarding whether or not the
features of the AURA CAS were claimed by the asserted
patent claims?

A I believe that is the question he asked me,
yes.

Q And what did you conclude?



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1 A I told him that I was not aware of any
2 significant features of the AURA system that were not
3 claimed in the patent.

4 MR. WISNIA: Objection. Outside the scope.
5 BY MR. SCHODDE:

6 Q The number of times you mentioned the
7 Next-Gen Signaling Conference. Do you recall that?

8 A Yes.

9 Q What is that?

10 A It's a next generation technology rail
11 conference that happens annually, I believe. And it's
12 specifically targeted to train control. And so that
13 had been a frequent place that Ultra-wideband, I think,
14 was at least referenced in some respect as well as any
15 newer technologies.

16 MR. WISNIA: Objection. Nonresponsive. Move
17 to strike.

18 BY MR. SCHODDE:

19 Q Did you attend the Next-Gen conference this
20 year?

21 A Yes, I did in October.

22 Q Do you recall approximately when you
23 attended?

24 MR. WISNIA: Objection. Outside the scope.

25 THE WITNESS: It was late October of this



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1 year.

2 BY MR. SCHODDE:

3 Q And I think you mentioned in your
4 cross-examination that you picked up some literature
5 from Petitioner Piper at that conference. Do you
6 recall that?

7 A Yes, I do. I did pick up --

8 MR. WISNIA: Sorry, sir. I'm just -- just
9 take a pause just so I can make the objection and we
10 don't speak on top of each other.

11 THE WITNESS: I'm very sorry.

12 MR. SCHODDE: Do you have that?

13 THE COURT REPORTER: Yes, I got it.

14 (WHEREUPON Exhibit 2030 was marked
15 for identification)

16 MR. SCHODDE: Exhibit 2030 Piper literature.
17 Two pages entitled "Piper Reliably Innovative Transit
18 Solutions." What is Exhibit 2030?

19 MR. WISNIA: Objection. Outside the scope.

20 THE WITNESS: It is a brochure from Piper
21 that appears to be a summary of projects and solutions
22 that Piper has for the rail industry.

23 BY MR. SCHODDE:

24 Q On the first page, there's a "Project:
25 Amtrak MOW." Do you see that?



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1 A Yes, I do.

2 Q Was a Piper project for Amtrak mentioned at
3 the Next-Gen conference that you attended?

4 MR. WISNIA: Objection. Outside the scope.

5 THE WITNESS: Yes. The CEO, Robert Hanczor,
6 however you say his name, my apologies, he talked about
7 that at length in his talk, the time that he had. And
8 he mentioned that they were deploying their equipment.
9 He said they had 500 installed and expected to have
10 1000 installed by the end of this year, 2023.

11 BY MR. SCHODDE:

12 Q And Mr. Hanczor, to your knowledge, is who?

13 A He is the CEO, I believe, of Piper Networks.

14 Q That's the Petitioner, one of the
15 Petitioners?

16 A I believe that is one of the Petitioners,
17 yes.

18 Q Did you pick up any other literature while
19 you were there?

20 A There was at least one other brochure that I
21 picked up.

22 (WHEREUPON Exhibit 2031 was marked
23 for identification)

24 BY MR. SCHODDE:

25 Q Okay. Is Exhibit 2031 another Piper brochure



1 entitled "Helix by Piper"?

2 MR. WISNIA: Objection. Outside the scope.

3 BY MR. SCHODDE:

4 Q What is Exhibit 2031?

5 A Exhibit 2031 is entitled "Helix by Piper".
6 It appears to be a highlight of the capabilities of the
7 Helix system sold by Piper.

8 Q And when did it first come to your attention?

9 MR. WISNIA: Objection. Outside the scope.

10 THE WITNESS: When did the Helix system first
11 come to my attention?

12 BY MR. SCHODDE:

13 Q No, 2031, the exhibit.

14 A Okay.

15 Q How did you first get it?

16 A I first saw this at the Next-Gen conference
17 in late October when I retrieved the brochure from
18 their display, the Piper display at the show.

19 Q Is that also where you also got 2030?

20 A Yes. That's also where I got 2030.

21 Q And is this 2031 describing the system that
22 Mr. Hanczor was referring to as being installed at
23 Amtrak?

24 MR. WISNIA: Objection. Form. Outside the
25 scope.



1 THE WITNESS: I believe it was because he was
2 talking about it being installed along the East Coast
3 corridor. And it has the features that he was talking
4 about during his discussion, at least some of them.
5 And I believe he even mentioned Helix in his talk, but
6 I know the features he definitely did mention.

7 MR. SCHODDE: Thank you, Mr. Gunther.

8 MR. WISNIA: I have no further questions.

9 THE VIDEOGRAPHER: Can we just get the orders
10 on the record?

11 MR. SCHODDE: I'd like the transcript by
12 Friday 5:00 p.m. Friday. I do not need the video.

13 MR. WISNIA: I will take a video. Petitioner
14 will take a video going on.

15 MR. SCHODDE: I might ask for the video
16 later. I don't need it now.

17 MR. RAHMEIER: We'll take the transcript on
18 the same timeline or at least a rough. Do you provide
19 roughs?

20 THE COURT REPORTER: Yeah.

21 MR. RAHMEIER: Howard, what do you prefer?

22 MR. WISNIA: Whatever you guys want. It
23 doesn't matter to me. Why don't we not make her have
24 to type all this? Let's go off the record.

25 THE VIDEOGRAPHER: Going off the record at



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5:14 p.m.

(WHEREUPON the deposition was
adjourned at 5:14 p.m.)



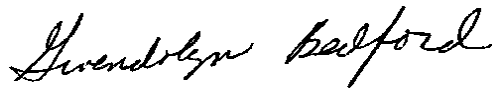
1 STATE OF ILLINOIS)
2 COUNTY OF C O O K)
3

4 C E R T I F I C A T E
5

6 The within and foregoing deposition of the
7 witness was taken before GWENDOLYN BEDFORD, Certified
8 Shorthand Reporter in the City of Chicago, County of
9 Cook and State of Illinois, and there were present at
10 the taking of said deposition Counsel as previously set
11 forth.

12 The undersigned is not interested in the
13 within case, nor of kin or counsel to any of the
14 parties.

15 IN TESTIMONY WHEREOF, I have hereunto set my
16 hand this 25th day of November, 2023.

17 
18 GWENDOLYN BEDFORD, C.S.R.
19 No. 084-003700
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