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Transcript of Charles Eldering, Ph.D.

Date: June 21, 2024

Case: CommScope Technologies LLC -v- Belden Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

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1 Q. Could you please state your full 2 name? 3 A. Charles A. Eldering. 4 Q. And Dr. Eldering do you prefer 5 doctor, mister, sir? 6 A. Dr. Eldering is fine. 7 Q. Doctor, okay. 8 A. Thank you. 9 Q. I will try to use that 10 consistently. Dr. Eldering, I see from your CV 11 that you've been deposed many times before, so 12 I won't spend a lot of time on giving you the 13 lay of the land because you know how these 14 things go. But I do want to ask, what did you 15 do to prepare for this deposition? 16 A. I reviewed the pertinent materials 17 to the case in particular my declarations, 18 initial declarations, and supplemental second 19 declarations, the references, and met with 20 counsel to review the matter in general. 21 Q. Okay. You referenced initial and 22 supplemental declarations, so you submitted two	1 A. That is correct. 2 Q. Okay. So I will just refer to your 3 537 declaration, and by that, I mean both the 4 initial and the supplemental. Does that make 5 sense? 6 A. Yes, understood. 7 Q. And where it's relevant to refer to 8 one or the other, the initial or the 9 supplemental, I will try to make that clear? 10 A. Okay. 11 Q. Okay. And then, the second matter 12 that we're here for today concerned the 095 13 patent; does that sound correct? 14 A. Yes, that does sound correct. 15 Q. Okay. So again, I will refer to 16 your 095 declaration throughout this 17 deposition. Are we on the same page when I'm 18 referring to your 095 declaration? 19 A. Yes. 20 Q. Okay. And again, I -- your initial 21 095 declaration and your supplemental 095 22 declaration had the paragraphs consecutively
1 declarations for each of the two matters we are 2 here for today, correct? 3 A. I submitted a declaration followed 4 by a second declaration in each of the matters, 5 a supplemental declaration, two declarations 6 per matter for a total of four declarations. 7 Q. Okay. And one declaration 8 concerned the 537 patent; is that correct? 9 A. That is correct. 10 Q. Okay. And so for shorthand today, 11 I will refer to your 537 declaration. Does 12 that work for you? 13 A. Yes, it does. 14 Q. Okay. And when I say the 537 15 declaration, your initial declaration and your 16 supplemental declaration had consecutively 17 numbered paragraphs, correct? 18 A. That is correct. 19 Q. Okay. So they are two separate 20 exhibits, but the paragraphs in the second 21 exhibit continue numbering from the first 22 exhibit, correct?	1 numbered, correct? 2 A. Yes. 3 Q. Okay. All right. So now that we 4 have that nomenclature and housekeeping out of 5 the way, you mentioned earlier that you met 6 with your counsel in preparation for this 7 deposition, correct? 8 A. That is correct. 9 Q. When did you meet with your 10 counsel? 11 A. That would have been yesterday. 12 Q. For approximately how long did you 13 meet? 14 A. Approximately, five hours. 15 Q. Did you meet with your counsel on 16 any other occasions to prepare for this 17 deposition? 18 A. We had some Zoom calls in the 19 preceding weeks, which were to review the 20 matter in general and in preparation for the 21 deposition. 22 Q. Approximately, how many Zoom calls

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1 did you have in the weeks leading up to this 2 deposition? 3 A. Two to three. 4 Q. And approximately, how long were 5 each of those two to three Zoom calls? 6 A. Approximately, an hour and a half 7 each. 8 Q. So when you met with counsel 9 yesterday, who was present? 10 A. Mr. Tom Hoehner and at times, Mr. 11 Dennis Sullivan. 12 Q. Anyone else? 13 A. No. 14 Q. Did you speak with anyone other 15 than your counsel in preparation for this 16 deposition? 17 A. I did not. 18 Q. When you prepared -- sorry, going 19 back to the initial 095 and 537 declarations 20 that you submitted in these matters, did you 21 write the first draft of those declarations? 22 A. Yes, I did.	11 1 access to transcripts from those depositions. 2 Q. Did you review those transcripts 3 prior to submitting your supplemental 4 declarations in the 537 and 095 matters? 5 A. I do not, as I sit here, recall the 6 specific timeline, but I believe I did have 7 access to and review those depositions prior to 8 my supplemental declaration. 9 Q. And I -- I guess earlier, I assumed 10 you had been deposed before, but I guess I 11 should actually ask. So have you been deposed 12 before? 13 A. Yes, I have. 14 Q. Approximately, how many times? 15 A. It's probably close to 50 times at 16 this point. 17 Q. And has that been primarily for 18 patent related matters? 19 A. Yes, primarily for patent related 20 matters. 21 Q. So are you familiar with what I'll 22 call conventional telephone cable, and by that
10 1 Q. And how about the supplemental 2 declarations in each of the 537 and 095 3 matters? 4 THE COURT REPORTER: I'm sorry, in 5 each of the? 6 Q. 537 and 095 matters. 7 A. Yes, I recall providing rough 8 drafts. 9 Q. So prior to submitting your 10 supplemental declarations in each of the 095 11 and 537 matters, were you aware that 12 CommScope's expert had been deposed? 13 A. Could you repeat the question, 14 please? 15 Q. Sure. So prior to submitting your 16 supplemental declarations in each of the 537 17 and 095 matters, were you aware that 18 CommScope's expert in these matters had been 19 deposed? 20 A. I was aware of CommScope's expert 21 being deposed. I don't recall when I became 22 aware of that. I did, at some point, have	12 1 I mean, the telephone cable that would have 2 been buried in the ground in the '60s, '70s, 3 '80s, that time frame? 4 MR. HOEHNER: Objection to form. 5 A. I am familiar with the telephone 6 system at that point in time and generally 7 familiar with the variety of cables that were 8 used. 9 Q. Okay. Are you familiar with a 10 telephone exchange cable? 11 A. I am not sure what particular cable 12 you're referring to in terms of telephone 13 exchange. I know what a telephone exchange is. 14 I'm not sure what cable in particular is being 15 referred to there. 16 Q. Okay. Let's just talk about, let's 17 say in the 1960s and 1970s. A telephone cable 18 that was buried in the ground going between 19 houses in a neighborhood, are you familiar with 20 that type of cable? 21 MR. HOEHNER: Objection to form. 22 A. Again, I'm not sure which part of

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13 1 the network you are referring to. If you're 2 referring to the distribution and drop cables, 3 that's different than the trunk cables -- 4 THE COURT REPORTER: I'm sorry, 5 than -- that's different than the? 6 A. Trunk cables. 7 Q. Okay. Well, let's take each of 8 those, so a trunk cable, what is a trunk cable 9 in a telephone network? 10 A. A trunk cable would be carrying a 11 group of signals, typically multiplexed signals 12 in pulse code modulation form. 13 Q. And at what timeframe are -- are we 14 talking here? 15 A. Any time after the inception of the 16 digital telephone network which would have been 17 probably late 50s, early 60s. 18 Q. Okay. Okay, so next, you have the 19 distribution cables, correct? 20 A. I believe so, yes. 21 Q. What is a telephone distribution 22 cable?	15 1 have the drop cable that goes to the home. Is 2 there something in between? 3 A. There typically -- trunk cable 4 is -- typically refers to intercity cables 5 carrying aggregated signals. Distribution 6 cable typically refers to -- can refer to 7 aggregated signals being transported to a 8 neighborhood -- 9 THE COURT REPORTER: I'm sorry, can 10 refer to? 11 A. Aggregated signals being 12 transported to a neighborhood, and then, the 13 final leg, sometimes referred to as the drop 14 cable, goes to the home. 15 Q. Okay. And fair to say at least at 16 a high level, this was the system for telephone 17 cable that was used in the '60s, '70s, and 18 '80s, correct? 19 A. No. 20 MR. HOEHNER: Objection to form. 21 A. I -- I wouldn't -- I wouldn't agree 22 with that.
14 1 A. The distribution -- are -- are 2 you -- may I ask for a clarification? 3 Q. Sure. 4 A. Are you referring to distribution 5 and drop cable, then, that's running to the 6 home? 7 Q. Is a distribution cable different 8 than a drop cable? 9 A. It can be. Depending on -- 10 different terminology is used. The -- and -- 11 and it gets confused between the cable industry 12 and the telephone industry, but probably safest 13 to call the cable going to the home to be 14 the -- the drop cable maybe -- 15 Q. Okay. 16 A. -- the easiest thing to call it. 17 Q. And for now, let's just stick with 18 the telephone system -- 19 A. Okay. 20 Q. -- to make things a little -- a 21 little more clear. Okay. So in the telephone 22 system, you have the trunk cable and then you	16 1 Q. Okay. Why not? 2 A. In the -- in the '70s, the advent 3 of fiber-optic cable greatly impacted the 4 telephone network since much of the cable that 5 was carrying aggregated digital signals or 6 large bundles of cables could be replaced with 7 a single fiber-optic cable. 8 THE COURT REPORTER: I'm sorry, 9 could be replaced with a? 10 A. Single fiber-optic cable. 11 Q. Okay. So let's set the '70s and 12 the advent of the fiber optic cable aside, and 13 let's just focus on the 1960 -- '60s timeframe. 14 So in the 1960s timeframe, is it 15 fair to say that the telephone cable network in 16 the United States generally consisted of trunk 17 cables, distribution cables, and drop cables? 18 MR. HOEHNER: Objection to form. 19 Scope. 20 A. I mean, that's a pretty big 21 generalization, but you could start to make a 22 model like that.

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17 1 Q. Okay. So did telephone trunk 2 cables in the 1960s use copper twisted pairs? 3 A. That depends. They may or may not 4 have. 5 Q. Okay. How about telephone 6 distribution cables in the 1960s, did they use 7 copper twisted pairs? 8 A. They may have used twisted pairs, 9 may have used other types of cable to transport 10 aggregated signals. 11 Q. Was one more -- one type more 12 common than the other? 13 THE COURT REPORTER: I'm sorry, was 14 one more? 15 Q. Was one type more common than the 16 other? 17 MR. HOEHNER: Objection to form. 18 A. I -- I don't know. This is -- 19 you're asking at a very general level, so I -- 20 I don't know. 21 Q. How about drop cables, telephone 22 drop cables in the 1960s, did they use copper	19 1 signals. It could have been signals carried on 2 a -- on a plurality of wires. 3 THE COURT REPORTER: On a? 4 A. Plurality of wires. It would have 5 depended heavily on the network design. 6 Q. Is it fair to say that telephone 7 distribution cables in the 1960s most commonly 8 used twisted pairs? 9 A. Again, it would depend on the 10 network design and the type of equipment that 11 were used in what is termed the last mile to 12 distribute the telephone signals. 13 Q. Is it fair to say that telephone 14 trunk cables in the 1960s most commonly used 15 twisted pairs? 16 A. Could you repeat the question, 17 please? 18 Q. Is it fair to say that telephone 19 trunk cables in the 1960s most commonly used 20 twisted pairs? 21 A. I -- I don't know. They could have 22 easily used other forms of cabling to carry the
18 1 twisted pairs? 2 A. Typically, the drop cable used 3 twisted wire pairs in carrying a small number 4 of pairs to the home. 5 Q. And what would you consider a small 6 number of pairs? 7 A. Typical installation to a home 8 would have been comprised of probably four -- 9 four pairs -- two to four pairs. 10 Q. Okay. How about a distribution 11 cable, how many pairs would have been in that? 12 A. That would have been very 13 application, location specific, so I don't 14 know. 15 Q. Do you have a ballpark idea? 16 MR. HOEHNER: Objection to form. 17 A. It would depend, again, on the 18 equipment in the network -- or excuse me, not 19 again, but one would have to consider the 20 equipment in the network, how many signals were 21 multiplexed. It could have been -- it could 22 have been a single wire carrying multiplexed	20 1 aggregated digitized signals. 2 Q. So your answer is you don't know? 3 MR. HOEHNER: Objection to form. 4 A. There may have used twisted wire 5 pair but could have used other types of cabling 6 to transmit aggregated signals. 7 Q. Was twisted pair the most common 8 type of telephone cable used in the 1960s? 9 MR. HOEHNER: Objection. Form. 10 A. Could you repeat the question, 11 please? 12 Q. Was twisted pair the most common 13 type of telephone cable used in the 1960s? 14 MR. HOEHNER: Objection. Form. 15 A. That would depend on which part of 16 the network you were referring to. 17 Q. How about for telephone trunk 18 cables? 19 A. A variety of cables would have been 20 used for the telephone trunk cables. 21 Q. Okay. That wasn't quite my 22 question. Was twisted pair the most common

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1 type of trunk telephone cable used in the 2 1960s? 3 A. Twisted wire pair was one of the 4 types of cables used in the telephone system, 5 including in the trunk connections, but the 6 most common type would have depended on the 7 particular types of network equipment being 8 used in that telephone -- particular telephone 9 network. 10 Q. What do you mean particular types 11 of network equipment being used? 12 A. There are and were, at that time, a 13 variety of ways to transmit the telephone 14 signals, including multiplexing of the signals 15 into aggregated T1s and other aggregated 16 signals carrying mechanisms in which multiple 17 signals were digitally multiplexed and not 18 necessarily transmitted over twisted wire pair 19 but other types of cable. 20 Q. When you say other types of cable, 21 what are you referring to? 22 A. Other types of cable, including	21 1 those type of cables actually being used in the 2 telephone system in the 1960s? 3 A. If you're referring to a specific 4 brand, as I sit here -- or a model number, as I 5 sit here, no. 6 Q. And fair to say, you did not 7 provide any examples of those type of cables in 8 your declarations, correct? 9 A. Could you repeat the question, 10 please? 11 Q. It is fair to say that you didn't 12 provide any examples of these types of 13 non-twisted pair cables in your declarations, 14 correct? 15 MR. HOEHNER: Objection to form. 16 A. I think there may be examples of 17 different types of cables in all of these 18 references, so I -- I don't think that's a 19 correct answer -- or I don't think it's a 20 correct statement that we didn't provide any 21 examples. I think there are examples of many 22 types of cables in the references provided.
22 1 unbalanced cables. 2 Q. Are you thinking of any specific 3 type of unbalanced cable? 4 A. There were multiple types of 5 unbalanced cables. Coaxial cable is one such 6 type of cable. 7 Q. Were there any other types? 8 A. Yes. 9 Q. Okay. What were they? 10 A. Any type of cable in which the 11 signal is transmitted in a single ended portion 12 on an unbalanced line, such as a single 13 conductor. 14 Q. Okay. Other than coaxial cables, 15 are you aware of any specific type of telephone 16 cables that were in use in the 1960s that did 17 not use twisted pairs? 18 A. Yes. The cables which carried 19 aggregated signals on unbalanced single 20 conductors, aggregated which -- with multiple 21 conductors being aggregated together. 22 Q. Okay. Are you aware of any of	23 1 Q. Okay. Can you point me to an 2 example of a telephone cable that would have 3 been used as a trunk cable or a distribution 4 cable in the 1960s that did not use twisted 5 pairs? 6 A. Would you like me to look through 7 other references? 8 Q. Does any immediately come to mind? 9 A. I would have to refresh. I would 10 have to look through, and let me take a look. 11 Q. Okay. 12 MR. HOEHNER: Just so the record's 13 clear, Dr. Eldering, can you state what 14 you're looking at right now? 15 A. I'm referring to the list of 16 materials reviewed in the 537 declaration. 17 MR. HOEHNER: Thank you. 18 A. In response to your question, if I 19 were to begin reviewing the references for 20 commercially available products or particular 21 cables, I would look at Exhibit 1016, 22 Electronic Wiring Cable User's Guide,
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25 1 performance and selection. I would look at the 2 Exhibit 1029, G. F. Moore Electric Cable 3 Handbook, and I would review Exhibit 1035, 4 Alcatel Cable Systems Product Catalog, as well 5 as all of the patent references cited to see 6 what the mention of products was. 7 Q. Okay. So those exhibits that you 8 just listed, 1016, 1029, 1035, those are all 9 exhibits submitted by the petitioner CommScope 10 in the two matters we're here for today, 11 correct? 12 A. I don't know who submitted them, 13 but if you're telling me that CommScope 14 submitted them, I wouldn't have a basis to 15 disagree with you. 16 Q. Okay. And did you, in fact, review 17 those exhibits as part of putting together your 18 responsive declarations? 19 A. I believe I have seen those 20 exhibits in at least -- at least excerpts 21 from -- from those exhibits. 22 Q. Okay. And did you identify any	27 1 system they were used in. 2 Q. Is it fair to say that conventional 3 telephone trunk and distribution cables in the 4 1960s used twisted pairs? 5 MR. HOEHNER: Objection to form. 6 A. Could you repeat the question, 7 please? 8 Q. Is it fair to say that conventional 9 telephone trunk and distribution cables in the 10 1960s used twisted pairs? 11 MR. HOEHNER: Objection to form. 12 A. As I think I previously stated, a 13 number of types of cables were used in the 14 telephone system and included other than 15 twisted wire pair, as demonstrated in a number 16 of the references in this proceeding. 17 Q. Are you able to identify any 18 telephone trunk or distribution cables of the 19 type used in the 1960s that did not use twisted 20 pairs? 21 MR. HOEHNER: Objection to form. 22 A. Again, it was not in the scope of
26 1 telephone trunk or distribution cables that did 2 not use twisted pairs during your review of 3 those exhibits in preparation for submitting 4 your rebuttal declarations? 5 A. Could you repeat the question, 6 please? 7 Q. So in reviewing the exhibits you 8 just identified in preparation for submitting 9 your responsive declarations, did you identify 10 any telephone trunk or distribution cables that 11 did not use twisted pairs? 12 MR. HOEHNER: Objection to form. 13 A. I was never asked, as part of this 14 proceeding, to review cables with respect to 15 their particular application as trunk or 16 distribution cables but generally considered 17 cables that were used in the telephone system, 18 and as such, identified cables such as the 19 cables identified in some of the patents in 20 this proceeding that did not use twisted wire 21 pair, but there was never an effort to classify 22 those cables as to which part of the telephone	28 1 my research to investigate which cables were 2 used in the trunk and distribution systems as 3 part of this proceeding. 4 Q. Okay. So which cables did you 5 focus on? 6 A. Are -- are you referring to a 7 particular -- the 537 or 095? 8 Q. I'm talking about both right now. 9 A. Could you repeat the question, 10 please? 11 Q. So you answered it was not in the 12 scope of your research to investigate which 13 cables were used in the trunk and distribution 14 systems, and I'm asking you which cables, then, 15 did you focus on? 16 MR. HOEHNER: Objection to form. 17 A. I focused on cables relevant to 18 this proceeding. For example, in the 095 19 patent proceeding, I focused on that cable for 20 example, as well as cables such as those 21 described in the Roberts reference and Yanagita 22 reference, for example, in addition to others.

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29 1 Q. Okay. So you mentioned the Roberts 2 reference, and that is Exhibit 1009 in both 3 proceedings, correct? 4 A. I believe that is correct, yes. 5 Q. Well, let me -- let me back up. So 6 is it your opinion that telephone trunk and 7 distribution cables are not relevant to this 8 proceeding? 9 MR. HOEHNER: Objection to form. 10 A. Could you repeat the question, 11 please? 12 Q. Is it your opinion that telephone 13 trunk and distribution cables are not relevant 14 to this proceeding? 15 MR. HOEHNER: Objection to form. 16 A. It is my understanding that the 17 cables relevant to this proceeding are those 18 that have been described in the relevant -- the 19 patent owner's patents, the 095 and 537 20 patents, as well as those cables described in 21 the references cited by the petitioner without 22 regard to where they appear in the network.	31 1 Q. So did conventional telephone trunk 2 and distribution cables use twisted pairs? 3 MR. HOEHNER: Objection to form. 4 A. As I have previously stated, the 5 telephone network used a variety of cables in 6 the trunk and distribution sections, which 7 could have included twisted wire pairs as well 8 as other types of cables. 9 Q. Okay. That's not my question. My 10 question is: Was it conventional for telephone 11 trunk and distribution cables to use twisted 12 pairs? 13 MR. HOEHNER: Objection to form. 14 Asked and answered. 15 A. The telephone network, including 16 the trunk and distribution portions, used a 17 variety of cables, including twisted wire pair 18 cables as well as other cables that carried 19 individual or aggregated signals within that 20 part of the network. 21 Q. So in your opinion -- I guess what 22 I'm trying to understand -- are you saying that
30 1 Q. Okay. So fair to say that for this 2 proceeding, you did not investigate whether 3 telephone trunk and distribution cables -- 4 whether it was conventional for those cables to 5 use twisted pairs, true? 6 MR. HOEHNER: Objection to form. 7 A. Could you repeat the question, 8 please? 9 Q. Sure. So is it fair to say that 10 for this proceeding, you did not investigate 11 whether telephone trunk and distribution cables 12 conventionally used twisted pairs? 13 MR. HOEHNER: Objection to form. 14 A. No, that is not correct. I 15 reviewed the types of cables in -- that were 16 presented in the references, and based on my 17 knowledge of the telephone network, which uses 18 a variety of cables, was able to determine the 19 types of cables that were described in the 20 references without particular regard to whether 21 they were used in the trunk distribution or 22 drop part of the telephone network.	32 1 there was no conventional configuration for 2 telephone trunk and distribution cables, or are 3 you saying you don't know? 4 MR. HOEHNER: Objection to form. 5 A. I'm saying that the telephone 6 network was an expansive network which carried 7 many types of signals and used a variety of 8 cables in the trunk and distribution sections 9 of the network. 10 Q. Okay. Again, that -- that's not my 11 question. So I'm asking -- and again, trying 12 to understand what you're testifying to. Are 13 you saying that there was no conventional way 14 that telephone trunk and distribution cables 15 were configured as far as twisted pairs or no 16 twisted pairs, or are you saying you don't know 17 if there was a conventional way they were 18 configured? 19 MR. HOEHNER: Objection to form. 20 A. I am stating that based on my 21 experience, there were a variety of cabling 22 system used in the trunk and distribution parts

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33 1 of the network, and the choice of cable 2 depended on the types of signals being 3 transmitted, which could have included 4 individual voice, analog voice signals, or 5 digitized voice signals or aggregated digitized 6 voice signals and data -- digital data signals 7 and that the choice of the cable would have 8 been dependent on both the type -- on -- on the 9 type, quantity of signals being carried, as 10 well as the types of equipment being utilized. 11 Q. Okay. So again, we're talking -- 12 you know, pre-fiber optics era in 1960s, so 13 would a telephone trunk or distribution cable 14 carrying analog voice signals have 15 conventionally used twisted pairs? 16 MR. HOEHNER: Objection to form. 17 A. Could you repeat the question, 18 please? 19 Q. Would a telephone trunk or 20 distribution cable in the 1960s carrying analog 21 voice signals have conventionally used twisted 22 pairs?	35 1 trunk or distribution cables that carried 2 signals in an unbalanced form in the 1960s 3 timeframe? 4 MR. HOEHNER: Objection to form. 5 Scope. 6 A. That particular research -- you're 7 asking if I know of a particular type of brand 8 or model of cable used in the 1960s, and that 9 is not something that I included in my reports 10 nor as I sit here, can I name a particular 11 brand, model, color, or such of a particular 12 cable. 13 Q. Was transmitting signals in 14 unbalanced form via telephone trunk or 15 distribution cable conventional in the 1960s? 16 MR. HOEHNER: Objection to form. 17 A. Could you repeat the question, 18 please? 19 Q. Was transmitting signals in an 20 unbalanced form via a telephone trunk or 21 distribution cable conventional in the 1960s? 22 MR. HOEHNER: Objection to form.
34 1 MR. HOEHNER: Objection to form. 2 A. That would have depended on the 3 distance and particulars of the network and the 4 types of equipment being used at both ends of 5 the network or that part of the network. 6 Q. Okay. What other form could that 7 telephone trunk or distribution cable in the 8 1960s have taken? 9 MR. HOEHNER: Objection. Form. 10 A. Could you repeat the question, 11 please? 12 Q. Okay. You just said that whether 13 the telephone trunk or distribution cable would 14 have used twisted pairs would depend on a bunch 15 of different things, so I'm saying, okay, other 16 than twisted pair, what forms would that 17 telephone trunk or distribution cable have 18 taken in the 1960s? 19 MR. HOEHNER: Objection. Form. 20 A. The cable could have carried the 21 signals in an unbalanced form. 22 Q. Are you aware of any telephone	36 1 A. Yes. In particular, through the 2 use of aggregated pulse code modulated signals. 3 Q. That was done via unbalanced? 4 A. That could have been done and was 5 done via unbalanced signaling or transmission 6 over an unbalanced cable in the 1960s 7 timeframe. 8 Q. Was that conventional in the 1960s? 9 MR. HOEHNER: Objection to form. 10 A. As I have previously stated, 11 conventional would depend on the type of 12 network, the distance, the signals being 13 carried, and the types of equipment at the ends 14 of the network so I don't know what you mean by 15 conventional nor do I have a specific answer. 16 Q. Did you, in any of your responsive 17 declarations, identify any examples of 18 telephone trunk or distribution cables that 19 carried signals in an unbalanced form? 20 A. Could you repeat your question, 21 please? 22 Q. Did you, in any of your responsive

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37 1 declarations, identify any examples of 2 telephone trunk or distribution cables that 3 carried signals in an unbalanced form? 4 A. There are numerous examples of 5 transmission of signals in unbalanced form in 6 the references in the proceeding, but I did not 7 perform an analysis as to where they were used 8 in the network in particular with respect to 9 trunk and distribution. 10 Q. Okay. So earlier you mentioned 11 Roberts, right? 12 A. I did, yes. 13 Q. Okay. And that's Exhibit 1009 in 14 these proceedings, correct? 15 A. Yes. 16 Q. Actually, before we get there, let 17 me ask a couple of other questions. 18 MR. KOHLHEPP: So I'm going to hand 19 you Exhibit 1018. 20 Q. Do you recognize Exhibit 1018? 21 A. Yes, I do. 22 Q. Okay. And this is a -- it's titled	39 1 reference. I've not confirmed its reliability, 2 so I can't comment on that. 3 Q. If you can, go to page 3, please. 4 And on page 3 of the exhibit, section 3.1, it 5 says, cable pairs. Do you see that? 6 A. Yes, I do. 7 Q. Okay. And the first sentence says, 8 the main and most important part of -- 9 THE COURT REPORTER: I'm sorry, the 10 main? 11 Q. The main and most important part of 12 a conventional two-wire loop is an outside 13 plant cable pair (two twisted conductors), 14 which provides a bidirectional signaling and 15 transmission path. Do you see that? 16 A. Yes, I do. 17 Q. Do you agree with that sentence? 18 A. I believe that sentence is accurate 19 in the context of this book, which is 20 describing the subscriber loop and in 21 particular, the drop cable to the home. 22 Q. Okay. So fair to say that in a
38 1 "Subscriber Loop Signaling and Transmission 2 Handbook." Do you see that? 3 A. Yes, I do. 4 Q. Were you familiar with this 5 document before this proceeding? 6 A. Yes, I was. 7 Q. Okay. How were you familiar with 8 it? 9 A. I own a copy of this book. 10 Q. Okay. Why do you own a copy of 11 this book? 12 A. Because I'm a telecommunications 13 engineer. 14 Q. Okay. So is -- is this book 15 something that telecommunications engineer's 16 commonly use or reference? 17 A. It is a reference. There is a -- 18 as I recall, a companion book on digital, and 19 there's other references we also use. 20 Q. Okay. Would you consider this a 21 reliable and reputable source? 22 A. I would say it's an exemplary	40 1 drop cable to the home, it was conventional to 2 use twisted pair conductors, correct? 3 A. Again, in this -- in the part of 4 the network that the author is describing, he's 5 describing a two-wire loop used in the 6 transmission path in the last section to the 7 home. 8 Q. Okay. And then, the next section, 9 section 3.2 refers to exchange cables. Do you 10 see that? 11 A. Yes, I do. 12 Q. Okay. Are you aware of any 13 exchange cables of the type described in this 14 section 3.2 that did not use twisted pairs? 15 MR. HOEHNER: Objection to form. 16 A. Could you repeat the question, 17 please? 18 Q. So we're looking at section 3.2, 19 which is describing exchange cables. Do you 20 see that? 21 A. Yes. 22 Q. And do you understand what it means

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1 by exchange cables? 2 A. The author describes exchange 3 cables used for exchange services such as 4 regular subscriber or private line services, 5 and then -- 6 THE COURT REPORTER: Subscriber or? 7 A. Private line services with an 8 asterisk referencing a footnote that says, many 9 times, trunk and exchange services are combined 10 in one cable. However, descriptions of trunk 11 systems are beyond the scope of this book. 12 Q. Okay. So you understand what the 13 author is talking about when it says exchange 14 cables? 15 A. Generally speaking, yes. 16 Q. Okay. So my question is: Are you 17 aware of any exchange cables of the type that 18 this author is talking about that did not use 19 twisted pairs? 20 A. I did not research that particular 21 aspect of exchange cables as part of this work, 22 so I don't know. I don't have -- I had not	1 exchange cables. Do you see that? 2 A. Yes, I do. 3 Q. Okay. For example, on page 4, 4 first full paragraph, it says, depending on the 5 gauge, exchange cables are available in 6 standard pair counts from six through 7 4,200 pairs. Do you see that? 8 A. Yes, I do. 9 Q. Okay. And then, starting at the 10 bottom of page 4 and continuing on to page 5, 11 it's talking about color coding of pairs. Do 12 you see that? 13 A. Yes, I do. 14 Q. Okay. And then, it starts at 15 bottom of page 4, section 3.3, many pairs are 16 combined together to form a cable. Do you see 17 that? 18 A. Yes, I do. 19 Q. And it says, the individual pairs 20 are formed into units. Do you see that? 21 A. Yes. 22 Q. Okay. So when the author is
1 researched that to assess the different types 2 of exchange cables that existed. 3 Q. Was the most common type of 4 exchange cable of the type that the author here 5 is describing a twisted pair cable? 6 A. Could you repeat your question, 7 please? 8 Q. Was the most common type of 9 exchange cable of the type that the author is 10 describing here a twisted pair cable? 11 A. Well, the author describes in 12 particular embodiments of exchange cables that 13 are twisted wire pairs without regards to their 14 commonality. 15 Q. Okay. Do you have any independent 16 knowledge of whether twisted pair cable was the 17 most common type of telephone exchange cable? 18 A. I did not do a survey of the types 19 of exchange cables as part of this proceeding, 20 so I do not have an opinion on that. 21 Q. So in this Exhibit 1018, sections 22 3.2 and 3.3, there's references to pairs in	1 talking about pairs here, that is referring to 2 twisted pairs, correct? 3 And it's helpful, I also direct you 4 to page 6, section 3.5, the first sentence. 5 A. Yes. Could you repeat your 6 question, please? 7 Q. When the author in this reference 8 book, entitled, "Subscriber Loop Signaling and 9 Transmission Handbook," is talking about pairs 10 in sections 3.2 and 3.3, the author is talking 11 specifically about twisted pairs, correct? 12 A. In this application in the 13 subscriber loop in this particular application 14 in this part of the telephone network, the 15 author appears to be referring to cable pair 16 that consist of two twisted insulated 17 conductors. 18 THE COURT REPORTER: I'm sorry, 19 that consists of two? 20 A. Insulated conductors. 21 Q. Okay. So the author is talking 22 about twisted pair telephone exchange cable,

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45 1 correct? 2 A. The author is talking about 3 exchange cables used in the subscriber loop and 4 those cables consisting of cable pairs that 5 consist of two twisted insulated conductors in 6 this application. 7 Q. Okay. And that is a twisted pair, 8 correct? 9 A. In this application, the author 10 appears to be referring to cable pairs that 11 consist of two twisted insulated conductors. 12 Q. Okay. Is there a reason you are 13 resisting calling that a twisted pair? 14 A. No, I believe I've answered your 15 question. 16 Q. Okay. So you would call that a 17 twisted pair? 18 A. I would say -- again, I maintain my 19 answer is the author is referring, in this 20 application, to cable pairs as two twisted 21 conductors. 22 Q. Is that different than a twisted	47 1 A. Yes, I do. 2 Q. Do you agree with those sentences? 3 A. I believe that that description of 4 the twist in this application is accurate, so I 5 would say I agree with those sentences in the 6 context of this application. 7 Q. Okay. So fair to say that 8 decreasing electromagnetic due to cross talk 9 between adjacent pairs in a cable -- 10 THE COURT REPORTER: I'm sorry, due 11 to increasing? 12 Q. I'll start over. So fair to say 13 that using twisted pairs to decrease 14 electromagnetic interference due to cross talk 15 between adjacent pairs in a cable was a known 16 benefit at least as of the date of this 17 reference? 18 MR. HOEHNER: Objection to form. 19 A. Well, it was known and understood 20 that twisting two insulated conductors would 21 decrease electromagnetic interference because 22 it reduced the amount of emissions and also
46 1 pair? 2 A. I'm -- I'm focussing on this 3 reference you have in front of me. 4 Q. I'm asking you as an expert in this 5 area, is that different than a twisted pair? 6 A. In this application what the author 7 refers to as a pair of two twisted conductors 8 could be also -- be referred to, based on my 9 experience, as a twisted wire pair. 10 Q. Okay. And also just a twisted 11 pair? 12 A. I typically would not refer to it 13 that way. I would say twisted wire pair for 14 more specificity. 15 Q. If you go to page 6, section 3.5, 16 we're still in Exhibit 1018. The first 17 sentence says, as previously noted, each cable 18 pair consists of two twisted insulated 19 conductors. The twist is used to decrease 20 electromagnetic interference (EMI) due to cross 21 talk between adjacent pairs in a cable. Do you 22 see that?	48 1 reduced the susceptibility to external 2 interference. 3 Q. And it was understood that that was 4 a positive thing for communications cables, 5 correct? 6 A. It was understood that that was one 7 mechanism to control electromagnetic 8 interference. 9 MR. HOEHNER: Is this a good time 10 for a break? 11 MR. KOHLHEPP: Can we do just a few 12 more questions on this subject if -- if 13 you're okay with that? 14 MR. HOEHNER: Sure, sure. 15 MR. KOHLHEPP: Okay. Let's also 16 take a look at Exhibit 1019. Actually, 17 let's go ahead and take a break. That's 18 fine. 19 THE VIDEOGRAPHER: We are going off 20 the record. The time is 10:12 a.m. 21 (Whereupon, an off-the-record 22 discussion was held.)

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49 1 We are back on the record. The 2 time is 10:26 a.m. 3 Q. Dr. Eldering, are you familiar with 4 standards for telephone cabling? 5 A. I'm familiar in general with 6 standards. I don't have any idea which 7 standard you're referring to. It would not 8 surprise me that there are standards related 9 to -- there are standards related to the 10 telephone system in various aspects of the 11 system. 12 Q. Are you familiar with the ICEA 13 standard for telecommunications cable? 14 A. I believe there are several ICEA 15 standards and there are numbers associated with 16 those standards, so I would need more 17 specificity. 18 Q. Do you know whether any of the ICEA 19 standards for telecommunications cable require 20 twisted pairs? 21 A. Well, you -- you're asking in the 22 abstract about ICEA. I -- there are -- there	51 1 filled? 2 Q. Filled telephone cables. 3 MR. HOEHNER: Objection to form. 4 Scope. 5 A. I don't recall seeing that specific 6 standard as part of this proceeding, and I -- 7 I -- as I sit here, I can't recall that 8 standard, but I may, indeed, have seen it in 9 the past as part of this proceeding or in my 10 general work. 11 Q. Okay. Are you familiar with an REA 12 specification for filled telephone cables as 13 you sit here today? 14 MR. HOEHNER: Objection to form. 15 Q. I'll represent it's not in the 16 filed materials. I'm just asking your 17 knowledge -- 18 A. Could I see a -- could I see a copy 19 of it? 20 Q. I'm just asking, are you -- do you 21 have familiarity with that as someone in the 22 industry?
50 1 are the Cat 6 and Cat A standards that I am 2 familiar with. I do not recall the numbers. 3 Those may be EIA standards. There may be a 4 corresponding international standard. Those, 5 to my recollection, are twisted wire pairs, but 6 there's also a standard for untwisted data 7 communications cable. But I'm not -- I would 8 need more information about which standards 9 you're referring to. 10 Q. Okay. So I'm -- I'm not right now 11 talking about Category 5 or Category 6 cables. 12 I'm talking about telecommunications cables 13 standards. Does that make sense? 14 A. No. 15 Q. Okay. Why not? 16 A. Category 6 is a telecommunications 17 cable so -- 18 Q. Okay. Fair -- fair enough. 19 All right, let me just ask a 20 different question. Are you familiar with the 21 REA specification for filled telephone cables? 22 THE COURT REPORTER: I'm sorry, for	52 1 A. I -- I may indeed have seen it. I 2 would need to see a copy to refresh my memory 3 to see if -- the extent to which I'm familiar 4 with it. 5 Q. Are you familiar with TIA 6 standards? 7 A. Yes, I am. 8 Q. Do any of the TIA standards for 9 telecommunications cables require twisted 10 pairs? 11 MR. HOEHNER: Objection to form. 12 Scope. 13 A. That would depend on the standard, 14 but I believe there are standards that cover 15 twisted wire pair cables from the TIA. 16 Q. When I say the term category cable, 17 does that mean anything to you? 18 A. You -- that term may refer to 19 category such as Category 5, Category 6, or 20 Category 6A. Although, it could have another 21 meaning. 22 Q. Okay. What is a Category 5 cable?

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53 1 A. Category 5 cable is a type of 2 telecommunications cable. 3 Q. Okay. What type of 4 telecommunications cable? 5 MR. HOEHNER: Objection. Form. 6 A. I believe the Category 5 cable was 7 developed, in particular, to support data 8 communications within a building. 9 Q. Approximately, when were Category 5 10 cables first used and sold? 11 MR. HOEHNER: Objection to form. 12 Scope. 13 A. I would have to -- I -- I don't 14 know the precise date. I would have to look at 15 notes or do additional searching to confirm 16 when they were first used. 17 Q. Was it the 1980s, 1990s, earlier 18 than that, the 1980s? 19 A. It -- to my knowledge, it could 20 have been earlier than the 1980s, but I don't 21 have a specific date. 22 Q. Do Category 5 cables use twisted	55 1 answer that question, but the standard, I am 2 sure, addresses the performance characteristics 3 and may or may not address the particulars of 4 how the cable meets those performance 5 requirements. 6 Q. In your experience, do Category 5 7 cables use twisted pairs? 8 A. I believe that Category 5 cables 9 use twisted wire pairs, but I would, again, 10 need to review the specification to see the 11 extent to which that is required or simply 12 utilized to achieve -- one mechanism that is 13 utilized to achieve the required performance 14 characteristics. 15 Q. Have you ever seen a Category 5 16 cable that does not use twisted pairs? 17 A. I don't know. 18 Q. So fair to say that you cannot 19 specifically recall seeing a Category 5 cable 20 that does not use twisted pairs? 21 MR. HOEHNER: Objection to form. 22 A. Again, I would need to review the
54 1 pairs? 2 A. As I sit here -- could you provide 3 me with a copy of the Category 5 standard? 4 Q. I'm just trying to understand, you 5 know, your experience in the field and what -- 6 what you're understanding is. 7 A. To my recollection, Category 5 8 encompasses twisted wire pair cables for use 9 within -- in particular, within buildings for 10 distribution of data signals. 11 Q. Are Category 5 cables required to 12 use twisted pairs? 13 A. I believe the Category 5 cable is 14 based on the use of twisted pairs, but the 15 specification, as I recall, is directed at the 16 performance characteristics of the cable. 17 Q. So is it possible for someone to 18 sell something called a Category 5 cable that 19 does not use twisted pairs? 20 MR. HOEHNER: Objection to form. 21 Scope. 22 A. I would need to see the standard to	56 1 specification to see what the Category 5 2 requires. 3 Q. I'm not asking about specification. 4 I'm just asking about your experience as 5 someone in this field. 6 A. I don't recall. 7 Q. And I think you also mentioned 8 Category 6. Is that another type of 9 telecommunications cable? 10 A. Yes, it is. 11 Q. What is a Category 6 cable? 12 A. It is a cable that is typically 13 used for data communications within a building. 14 Q. And approximately when were the 15 first Category 6 cables sold? 16 A. As I sit here, I do not recall the 17 specific timeline as to whether that was in the 18 1980s or subsequently. As to when Category 6 19 was developed, I do know that as data rates 20 increased over time, whether that was in the 21 '80s or the '90s, the data rates -- the data 22 rates that the electronics at the ends of the

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57 1 network were able to transmit and receive 2 exceeded the capabilities of the cable so that 3 additional cable standards were developed to 4 support higher data rate communications. 5 Q. Do Category 6 cables use twisted 6 pairs? 7 A. As I sit here, to the best of my 8 recollection and without looking at the 9 standard, they utilized twisted wire pairs, but 10 the standard, as I recall, is focused on the 11 performance characteristics of the cable. 12 Q. Can you recall ever seeing a 13 Category 6 cable that does not use twisted 14 pairs? 15 A. I -- I can't recall. 16 Q. How many twisted pairs are in a 17 Category 5 cable? 18 MR. HOEHNER: Objection to form. 19 Scope. 20 A. I -- I don't recall specifically. 21 I'd have to look at the standard. The number 22 four of pairs come to mind, but I -- without	59 1 Exhibit 2007 in the 095 matter. 2 Q. And Exhibit 2007 is your 3 supplemental declaration in the 095 matter, 4 correct? 5 A. Yes, I see that. 6 Q. Okay. And I want to go to 7 paragraph 145. Actually, let's start at 8 paragraph 144. So there, you're talking about 9 twisting of two insulated wires. Do you see 10 that? 11 A. Yes, I do. 12 Q. Okay. And then, the last sentence 13 at 144 says, these periodic field reversals 14 work to balance -- 15 THE COURT REPORTER: I'm sorry, 16 these periodic? 17 Q. Field reversals work to balance out 18 electromagnetic radiation of the twisted 19 conductor pair. Do you see that? 20 A. Yes, I do. 21 Q. Okay. And then, in paragraph 145, 22 you provided a -- a diagram, correct?
58 1 looking at the standard, I can't testify to the 2 exact number. 3 Q. How many twisted pairs are in a 4 Category 6 cable? 5 MR. HOEHNER: Objection to form. 6 A. Again, without looking at the 7 standard, I can't answer that question. 8 Although, I -- I recall four pairs, but that's 9 just a -- I would need to confirm that with the 10 standard. 11 Q. Let's go to -- and by the way, I 12 should have asked this before, you brought some 13 papers into this deposition today, correct? 14 A. I did, yes. 15 Q. What are those papers? 16 A. These are copies of the 17 declarations that I submitted in this 18 proceeding, both proceedings. 19 Q. Are those clean, unmarked copies? 20 A. Yes, they are. 21 Q. Okay. 22 MR. KOHLHEPP: Let's go to	60 1 A. That is correct. 2 Q. Okay. So on the far left, you have 3 what you have labeled single wire. Do you see 4 that? 5 A. Yes, I do. 6 Q. And earlier, you had referred to 7 unbalanced transmission. Do you recall that? 8 A. Yes, I do. 9 Q. So is that single wire diagram at 10 paragraph 145, is that depicting unbalanced 11 transmission? 12 A. The single wire could indeed be 13 used for unbalanced transmission. 14 Q. Okay. And then, on the right side 15 of that same diagram, you have twisted wires. 16 Do you see that? 17 A. Yes, I do. 18 Q. Okay. And is that depicting a form 19 of balanced transmission? 20 A. The -- in order to answer that 21 question, I'd like to refer to the center 22 diagram of the two parallel wires.

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1 Q. Okay. 2 A. So the -- you asked me about the 3 single wire, which could be used in an 4 unbalanced configuration. The two parallel 5 wires could be used in an unbalanced 6 configuration with one signal going in one 7 direction and a different unrelated -- 8 potentially unrelated signal going in the other 9 direction. That is one signal going on the red 10 line and a different signal on the blue line, 11 or the two parallel wires could be used in a 12 balanced configuration in which one line, for 13 example, the red line represents a signal of a 14 first phase and the other line, in this case 15 the blue line, could represent the same signal 16 but in an opposite phase, if you will, 17 inverted. 18 THE COURT REPORTER: If you will? 19 A. Inverted. Applying that same 20 logic, these twisted wires could be used in an 21 unbalanced configuration. Although, they would 22 typically be used in a balanced configuration	61 1 to that statement whatsoever, no. 2 Q. Okay. You would agree that by 3 1999, it was not novel to use twisted pairs in 4 data communications cables, right? 5 MR. HOEHNER: Objection to form. 6 A. Again, I don't -- I don't 7 understand. You -- you're bringing in the 8 concept of novelty, which in -- in the 9 abstract, doesn't have any meaning to me. To 10 say that twisted wire pairs were commonly used 11 in 1999 is accurate. I -- I don't know what 12 novelty we're talking about. 13 Q. And also, twisted wire pairs were 14 commonly used in data communications cables 15 prior to 1999, correct? 16 A. Twisted wire pairs were used in 17 data communication cables prior to 1999. That 18 would be accurate. 19 Q. They were commonly used in data 20 communications prior to 1999, correct? 21 A. They were used in a variety of 22 applications. Whether or not it was common
62 1 with one phase of the signal being transmitted 2 on a first wire such as the red wire and the 3 opposite phase being transmitted on the other 4 wire, in this case, the blue wire. 5 Q. So you would agree that twisted 6 pairs have been used in data communications 7 cables for many decades, correct? 8 A. I believe that is an accurate 9 statement, yes. 10 Q. So you would agree that by 1999, 11 there was nothing patentable about using 12 twisted pairs in data communications cables, 13 right? 14 MR. HOEHNER: Objection to form. 15 A. Could you repeat that question, 16 please? 17 Q. So you would agree that by 1999, 18 there was nothing patentable about using 19 twisted pairs in data communications cables -- 20 MR. HOEHNER: Objection to form. 21 Q. -- correct? 22 A. No, I -- I would -- could not agree	63 1 would depend on the particular application and 2 the place in the network. 3 Q. Okay. And when a particular 4 application is telephone trunk or exchange 5 cables, I believe you testified earlier that 6 you are not sure whether it was common to use 7 twisted pair? 8 A. I believe that my statement was 9 that there were many types of cables used in 10 the network and that the particular types of 11 cables and configurations depended on the 12 application and where at the -- the particulars 13 of the network, including the equipment at both 14 ends of the network. 15 Q. So sitting here today, if I say 16 that in the 1960s, the most common type of 17 telephone trunk and exchange cables were 18 twisted pair cables, let me -- let me re-ask 19 that question. 20 If I say that in the 1960s, the 21 most common type of telephone trunk and 22 exchange cables were twisted pair cables. Is
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1 that statement true or not true? 2 MR. HOEHNER: Objection to form. 3 A. Could you repeat the question, 4 please? 5 Q. The statement that in the 1960s the 6 most common type of telephone trunk and 7 exchange cables were twisted pair cables, true 8 or not true? 9 MR. HOEHNER: Objection to form. 10 A. Twisted wire pair cables were used 11 in the 1960s, but I did not perform an analysis 12 as to the extent that they were common or the 13 most common type of cabling used. And it would 14 depend on the particular parts of the network 15 and the equipment to which the cables were 16 connected to. 17 Q. Conventional telephone trunk and 18 exchange cables in the 1960s used twisted 19 pairs, true or not true? 20 MR. HOEHNER: Objection to form. 21 A. Again, there were a number of types 22 of cables used in the different parts of the	65 67 1 frequency or distribution of the types of 2 cables used in a telephone network in that time 3 period as part of this work, nor do I have such 4 information at my access as I sit here. 5 Q. Okay. I'm just, again, asking you 6 as -- as someone who has worked in the 7 telecommunications field, and I'm talking 8 specifically about telephone trunk and exchange 9 cables used in the 1960s. 10 A. As I -- 11 Q. Was there a conventional type of 12 cable used for those applications? 13 MR. HOEHNER: Objection to form. 14 Asked and answered. 15 A. There were a variety of types of 16 cables used in the telephone network at that 17 time period, and the types of cables depended 18 on where in the network, the particular network 19 and network operator, and the types of 20 electronics connecting to those cables at the 21 ends. And I did not perform an analysis of the 22 number of types of cables and the frequencies
66 1 telecommunications network, and I did not 2 perform a specific analysis as to what the 3 distribution of the frequency of the types of 4 cables used in the 1960s in particular parts of 5 the network were. And it would also depend on 6 the types of electronics connecting to the 7 cables at the end of the network. 8 Q. Okay. And again, I'm not asking 9 about your analysis. I'm just asking about 10 your knowledge as someone in the field, so not 11 analysis specific to this case. I'm just 12 asking, did conventional telephone trunk and 13 exchange cables in the 1960s use twisted pairs? 14 MR. HOEHNER: Objection to form. 15 Asked and answered. 16 A. The types of cables used in the 17 network -- there were a variety of types of 18 cables used in the network, and the types of 19 cables that were used would depend on not only 20 where they were used in the network, but the 21 electronics connecting to those cables at the 22 end. And I did not perform an analysis of the	68 1 at which they were used in that timeframe, nor 2 do I have such information at my access as I 3 sit here. 4 Q. Okay. And it -- is it fair to say 5 that you have not identified in any of your 6 declarations submitted in these proceedings any 7 telephone exchange or trunk cable that did not 8 use twisted pairs? 9 MR. HOEHNER: Objection to form. 10 A. Could you repeat the question, 11 please? 12 Q. Is it fair to say that you have not 13 identified in any of your declarations 14 submitted in these proceedings any telephone 15 exchange or trunk cable that did not use 16 twisted pair? 17 MR. HOEHNER: Objection to form. 18 A. I do not think that is an accurate 19 statement. I identified, in my declarations, a 20 number of cables that did not use twisted wire 21 pair that were used in the telecommunications 22 network, but I did not perform nor was I

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69 1 requested to perform an analysis of where those 2 cables that did not use twisted wire pair were 3 deployed in the network. 4 Q. Okay. Can you identify anywhere in 5 your declarations any examples of specifically 6 telephone trunk or exchange cable that did not 7 use twisted pairs? 8 MR. HOEHNER: Objection to form. 9 Asked and answered. 10 A. A number of the references in this 11 proceeding used were cables that did not employ 12 twisted wire pairs that were used in -- those 13 cables were used in the telecommunications 14 network, but I did not perform an analysis as 15 to where, nor was I requested to perform an 16 analysis as to where in the telecommunications 17 network they were used. 18 Q. Okay. And this isn't a trick 19 question. I'm -- I didn't see it anywhere in 20 your declarations, so I'm just trying to make 21 sure I didn't miss something. 22 So as you sit here today, you are	71 1 Q. So my question is: As you sit here 2 today, you are not able to identify any 3 examples in your declarations of telephone 4 trunk or exchange -- 5 THE COURT REPORTER: I'm sorry, 6 you're not able to identify any 7 examples? 8 Q. Of telephone trunk or exchange 9 cable that did not use twisted pairs? 10 MR. HOEHNER: Objection to form. 11 A. The cables referenced in this 12 proceeding include cables that did not use 13 twisted wire pairs. Those cables may have been 14 used in the trunk or exchange parts of the 15 network, but I did not perform an analysis of 16 where the cables in the references were used, 17 nor did I comment on that in the 095 18 declaration. I would need to review the 537 19 declaration to confirm that also, but as I sit 20 here, I see no reference in the 095 declaration 21 to where the cables, including those that did 22 not use twisted wire pair, were used in the
70 1 not able to identify any examples in your 2 declarations of telephone trunk or exchange 3 cable that did not use twisted pairs -- 4 MR. HOEHNER: Objection to form. 5 Q. -- is that correct? 6 A. So you -- so you're asking me 7 specifically with respect to the trunk and 8 exchange, and as such, I would like to review 9 my declaration and the references to confirm. 10 I will first review my declaration, and then, I 11 may need to look at some of the references to 12 confirm my statements with respect to the use 13 of those cables in the network. 14 MR. KOHLHEPP: So I'm just going to 15 note for the record that a fair amount 16 of time has passed here. 17 Q. Are you still reviewing, 18 Dr. Eldering? 19 A. Yes, I am. I've reviewed my 095 20 declaration. I'd be glad to answer your 21 question if you wouldn't mind asking it again, 22 at least with respect to the 095?	72 1 network. 2 Q. Okay. In your experience as 3 someone in the field of telecommunications, 4 have you ever seen telephone trunk or exchange 5 cable in the real world that did not use 6 twisted pairs? 7 A. As I previously stated, a number of 8 types of cables would be used in the 9 telecommunications network, and in the trunk 10 and exchange portions, the types of cables 11 would depend on the nature of the signals being 12 transmitted as well as the electronics 13 connected to the cables at the ends of the 14 network. 15 Q. Can you identify any specific real 16 world examples of telephone trunk or exchange 17 cables that did not use twisted pairs? 18 A. As I have previously stated, a 19 number of types of cables were used to transmit 20 signals in a telecommunications, including 21 unbalanced cables -- 22 Q. I'm not asking about the various

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1 types. I'm asking specifically about telephone 2 trunk and exchange cables. 3 A. I'm sorry, you interrupted me, so 4 could you repeat the questions, please? 5 Q. Can you identify any specific real 6 world examples of telephone trunk or exchange 7 cables that did not use twisted pairs? 8 A. As I have previously stated, a 9 number of types of cables were used in the 10 telecommunications network, including in the 11 trunk and exchange portions, and could – and 12 did include unbalanced transmission lines of 13 various types, including but not limited to 14 coaxial cables, which carry aggregated pulse 15 code modulation signals over the telephone 16 network. 17 Q. Okay. Outside of coaxial cables, 18 can you identify any real world examples of 19 telephone trunk or exchange cables that did not 20 use twisted pairs? 21 A. As I stated previously, the 22 telephone network used a number of types of	73 1 frequencies of their use in the trunk and 2 exchange network as a part of this proceeding. 3 Q. Okay. So your answer is that you 4 cannot identify any specific example, correct? 5 MR. HOEHNER: Objection to form. 6 A. As I previously stated, the 7 telephone network, including the trunk and 8 exchange portions of the network, utilized a 9 number of different types of cable to transport 10 telecommunications signals, and I did not 11 perform an analysis of the different types of 12 cable used in those applications, nor did I 13 perform an analysis of the frequency of use of 14 those types of cables in the trunk and exchange 15 portions of the telecommunications network as 16 part of this proceeding. 17 Q. So in the communications cabling 18 industry, there's a thing called near-end cross 19 talk, correct? 20 A. Yes, that is correct. 21 Q. Okay. What does near-end cross 22 talk mean to you?
74 1 cables, including unbalanced cables. I did not 2 perform – 3 Q. You keep -- you keep referring to 4 the telephone network. I'm just asking 5 specifically about telephone trunk and exchange 6 cables, so please confine your answer to that 7 part of the telephone network? 8 MR. HOEHNER: Counsel, I would just 9 ask to let the witness finish his answer 10 before interrupting. Thank you. 11 A. Could you repeat the question, 12 please? 13 Q. Okay. Specifically with respect to 14 the telephone trunk and exchange cable part of 15 the telephone network, can you identify any 16 specific examples of telephone trunk or 17 exchange cable that did not use twisted pairs? 18 A. The trunk and exchange portions of 19 the telecommunications network utilized a -- 20 and utilized a number of different types of 21 cable to carry signals. I did not perform an 22 analysis of the types of cables or the	75 1 A. Near-end cross talk generally 2 refers to interference between conductors that 3 are the interference originating when the 4 signals are launched on the conductors at 5 one – the transmission end of the network. 6 Q. Okay. Is it also fair to 7 characterize near-end cross talk as cross talk 8 between conductors transmitting in opposite 9 directions? 10 MR. HOEHNER: Objection to form. 11 A. I would like to put this in the -- 12 I would answer your question, but I would like 13 to put it in the context of the proceeding, and 14 as such, I would request a copy of the 095 15 patent for a second, please. Thank you. Could 16 you repeat your question, please? 17 Q. Is near-end cross talk generally 18 discussed in the context of cross talk between 19 conductors that are transmitting in the 20 opposite direction? 21 A. It is generally the case that 22 near-end cross talk will be more significant
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77 1 between -- will be a more significant issue 2 between signals being transmitted in opposite 3 directions, or in other words, cross talk 4 between the transmit and receive signals. 5 Although, differences between the transmit 6 signals themselves or the receive signals 7 themselves can result in cross talk. 8 Q. Is the term far-end cross talk 9 familiar to you? 10 A. Yes, it is. 11 Q. What does far-end cross talk mean 12 to you? 13 A. Far-end cross talk represents the 14 accumulated cross talk or the cross talk that 15 accumulates along the transmission path, 16 resulting in interference between signals at 17 the far end or the far end of the network or 18 cable. 19 Q. Is far-end cross talk a concern 20 that is commonly -- that commonly arises -- 21 THE COURT REPORTER: I'm sorry, 22 that commonly?	79 1 81. 2 A. Yes, I'm there. 3 Q. Okay. And then, at the top of 4 page 42, you have a diagram. Do you see that? 5 A. Yes, I do. 6 Q. Okay. So looking at the top of 7 that diagram, you have it labeled stranded. Do 8 you see that? 9 A. Yes, I do. 10 Q. Okay. And by that, you're 11 referring to a conductor that consists of a 12 number of smaller diameter copper wires -- 13 THE COURT REPORTER: Consists of a? 14 Q. Number of smaller diameter copper 15 wires that are twisted together to form the 16 overall larger single conductor, correct? 17 A. As I stated in the prior paragraph 18 81, the standard conductive wire could be 19 composed of stranded conductors, each conductor 20 containing a number of smaller diameter strands 21 of conductor material, i.e., smaller diameter 22 wires, again typically copper, that are twisted
78 1 Q. I'll start over. 2 Is far-end cross talk a concern 3 commonly associated with conductors 4 transmitting in the same direction? 5 A. Could you repeat the question, 6 please? 7 Q. Is far-end cross talk a concern 8 commonly associated with conductors 9 transmitting in the same direction? 10 A. Far-end cross talk represents the 11 cross talk accumulated over the transmission 12 path and can, in some instances, be due in 13 majority to the signal transmission in a 14 particular direction. Although, the 15 interference from other signals being 16 transmitted in the other direction could impact 17 the far-end cross talk. 18 Q. So in your declarations, you 19 discuss stranded wire. Do you recall that? 20 A. Yes, I do. 21 Q. Okay. And in particular, I direct 22 to Exhibit 2001 in the 095 matter in paragraph	80 1 together to form the overall larger single 2 conductor. 3 Q. Okay. Were there also other 4 field -- other terms in the field that refer to 5 this type of wire? 6 MR. HOEHNER: Objection to form. 7 A. I don't understand the question. 8 Q. So you said that that type of wire 9 that you just described is referred to as 10 stranded wire. Are there other terms used in 11 the field to refer to the same thing? 12 A. I don't understand the question, 13 and my view is, as I've stated in paragraph 81, 14 that you're referring to a conductor wire. And 15 the conductive wire -- and this is, you know, 16 at the time, 80 -- paragraph 81 is directed as 17 an analysis of a particular reference, but I 18 will state for the record that in general, not 19 just with respect to this reference, it was 20 well-known that a conductive wire -- and this 21 refers not only to telecommunications, but 22 standard electrical power wire, and that

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81 1 it's -- could be comprised of either one a 2 single solid core wire, containing a single 3 solid strand of conductive material, typically 4 copper, and that's called solid or solid core. 5 Or two stranded conductors, each conductor 6 containing a number of smaller diameter strands 7 of conductive material, i.e., smaller diameter 8 wires, again typically copper, that are twisted 9 together to form the overall larger single 10 conductor, and that is illustrated on the top 11 of page 42. 12 Q. So my question is: Were there any 13 other terms in the field used to refer to that 14 type of wire? 15 A. Which -- are you referring to 16 the -- what I'm calling stranded wire? 17 Q. What you have labeled stranded on 18 the top of page 42. 19 A. People may have referred to it in 20 other terms, but in my experience, I 21 understand -- have always understood since I 22 became familiar with wiring, probably in my	83 1 Q. Were you familiar with this 2 reference prior to this proceeding? 3 A. I do not recall having seen this 4 particular reference on cabling, but I have 5 seen other similar references on cabling prior 6 to this proceeding. 7 Q. And this Exhibit 1035 is a catalog 8 of some cables made by Alcatel, correct? 9 A. That appears to be the case, yes. 10 Q. You worked briefly at Alcatel, 11 right? 12 A. I did, yes. 13 Q. Let's go to page 13 of the exhibit, 14 and there's an image on the right that shows a 15 cable where some of the exterior sheath appears 16 to be cut away to expose conductors in the 17 interior. Do you see that? 18 A. Yes, I do. 19 Q. Okay. Does that image show twisted 20 pairs? 21 A. The image shows layers, including 22 an armor. There appears to be a -- some sort
82 1 adolescence, that stranded wire was as 2 described in paragraph 81 as stranded 3 conductors, each conductor containing a number 4 of smaller diameter strands of conductive 5 material -- 6 THE COURT REPORTER: Smaller number 7 of diameter? 8 A. Strands of conductive material, 9 i.e., smaller diameter wires, again typically 10 copper, that are twisted together to form the 11 overall larger single conductor, but as I've 12 stated, there may have been another term. 13 Although, I'm only familiar with that type of 14 wire as called stranded wire or a stranded 15 conductor. 16 MR. KOHLHEPP: Let's go to 17 Exhibit 1035. 18 Q. First of all, Dr. Eldering, do you 19 recognize Exhibit 1035? 20 A. I believe I have seen this in the 21 context, this reference -- or excuse me, this 22 exhibit in the context of this proceeding, yes.	84 1 of wire or fiber wrapped around a group of 2 cables, and the nature of the cables is not 3 clear from the image. 4 Q. Okay. But you would agree that is 5 an image of a twisted pair cable, correct? 6 A. I would not agree with that. It is 7 an image of a cable as I have described. It 8 shows a number of layers, including the outer 9 jacket. Then, I see what I think is an armor 10 layer. It looks like there's another 11 protective layer, which I believe is a 12 nonhygroscopic core wrap. There appears to be 13 another wire or fiber wrapped around a group of 14 conductors. The description of the conductors 15 on the left indicates that they are twisted 16 pairs. Although, that is not visible in the 17 image. 18 Q. Okay, but you don't doubt that that 19 image is showing a twisted pair cable, do you? 20 A. I cannot resolve that from the 21 image, but from the description on the left, 22 the cable construction is indicated to be

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85 1 twisted pairs, and further description of it is 2 insulated conductors twisted to form pairs with 3 varying lays to minimize cross talk and meet 4 capacitance unbalanced limitations. 5 Q. Is there anything about the image 6 on the right at page 13 that is inconsistent 7 with a twisted pair cable? 8 MR. HOEHNER: Objection to form. 9 A. This particular image does not 10 provide me with enough information to discern 11 the nature of the conductors and therefore, one 12 must rely on the description to the left under 13 cable construction. 14 Q. Okay, but my question is: Is there 15 anything in that image on the right that is 16 inconsistent with it being described as a 17 twisted pair cable? 18 A. The image on the right does not 19 provide any information to confirm the nature 20 of the conductors in the cable, which are 21 described in the left as twisted pairs. 22 Q. But there's nothing on that image	87 1 that you can see in the image on the right that 2 is inconsistent with it being a twisted pair 3 cable? 4 MR. HOEHNER: Objection to form. 5 A. The image on the right provide -- 6 does not provide sufficient information to 7 discern -- 8 Q. I'm not asking -- 9 A. -- the nature of the conductors. 10 Q. -- whether you can discern. I'm 11 asking if there is anything in there that is 12 inconsistent with it being a twisted pair 13 cable? 14 A. Could you repeat the question, 15 please? 16 Q. You keep telling me that there's 17 not sufficient information in the image to say 18 whether it's a twisted pair cable. Okay, but 19 that is not my question. My question is: Is 20 there anything in the image that is 21 inconsistent with it being a twisted pair 22 cable? Do you understand the difference?
86 1 on the right that makes you say, oh, no, I 2 don't think that is a twisted pair cable, 3 correct? 4 MR. HOEHNER: Objection to form. 5 A. The image on the right provides 6 insufficient information to discern the nature 7 of the conductors in the bundle. 8 Q. So certainly, it could be a twisted 9 pair cable, correct? 10 A. The image -- 11 Q. Sorry, it was certainly could be a 12 twisted pair cable, correct? 13 MR. HOEHNER: Objection to form. 14 A. The image on the right provides 15 insufficient information to discern the nature 16 of the insulated conductors, but they are 17 described in the text on the left as twisted 18 pairs. 19 Q. Okay. I understand you've been 20 deposed a lot, but we really need to get to the 21 point where you are answering my questions, 22 okay? So my question is: Is there anything	88 1 A. Yes. 2 Q. Okay. 3 A. The lack -- 4 THE COURT REPORTER: I'm sorry, 5 the? 6 A. The lack of information in the 7 image on the right makes it impossible to 8 discern whether there is anything consistent or 9 inconsistent with the use of twisted wire pair 10 in the cable. Although, the description on the 11 left clearly points out that the insulated 12 conductors are twisted to form pairs. 13 MR. KOHLHEPP: Let's go to 14 Exhibit 1017. 15 Q. Do you recognize Exhibit 1017? 16 A. I do. 17 Q. And it's entitled, "Subscriber Loop 18 and Signaling Transmission Handbook Digital." 19 Do you see that? 20 A. I do. 21 Q. Okay. So this -- I believe you 22 referenced a companion to the exhibit we were

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89 1 talking about earlier, the Reeve book. Is this 2 the digital companion? 3 A. It is indeed volume two of Reeve. 4 Q. Okay. Do you have a copy, 5 independently of this proceeding, of the 6 handbook shown in Exhibit 1017? 7 A. I do, yes. 8 Q. Okay. And have you used that 9 handbook during your career outside of this 10 proceeding? 11 A. I have, yes. 12 Q. And is the handbook that is shown 13 on Exhibit 1017 something that people who work 14 in the field of telecommunications would 15 commonly use? 16 A. It -- is it -- 17 MR. HOEHNER: Objection to form. 18 A. It is a reference that discusses 19 the subscriber loop, also referred to as the 20 last mile, and is, indeed, a reference 21 individuals focused on the last mile would use 22 to research or gain information about that	91 1 please? 2 Q. Do you agree that figure 7.3A is 3 showing a twisted pair cable? 4 A. Well, 7.3A -- one second, please. 5 According to the prior text, figure 7.3A 6 illustrates the construction of a few cable 7 types. The heading is summary of twisted pair 8 cable physical characteristics. The heading at 9 the top of the page says, section -- of the 10 following page, page 313 says, section 7.6, 11 twisted pair transmission media. So I believe 12 one would understand that the figure in A is 13 attempting to illustrate twisted pair 14 transmission media. 15 Q. Okay. And then, what it points as 16 plastic insulated conductors that would be the 17 twisted pairs, correct? 18 A. Well, those are the plastic 19 insulated conductors, and in the context of the 20 text, the text is referring to twisted pair 21 transmission media. 22 Q. Okay, but somebody of skill in art
90 1 portion of the telecommunications network. 2 Q. Okay. Let's go to page 24 in the 3 exhibit. Actually, let's start on page 23. In 4 the middle of the page, there's a heading 5 titled, "7.6.2.7 Summary of Twisted Pair Cable 6 Physical Characteristics." Do you see that? 7 A. I do, yes. 8 Q. Okay. And then, the second 9 sentence below that heading says, figure 7-3 10 illustrates the construction of a few cable 11 types. Do you see that? 12 A. I -- I'm sorry I lost you. Oh, you 13 said in the -- in the text above? 14 Q. Yes. 15 A. Yeah, I see that. Yes. 16 Q. Okay. And if we flip to figure 7-3 17 on page 24, at the top, A, there's a -- again, 18 a cutaway image of a cable. Do you see that? 19 A. Yes, I do. 20 Q. Okay. And you would agree that 21 that is showing a twisted pair cable, correct? 22 A. Could you repeat the question,	92 1 would understand that what is being pointed to 2 as plastic insulated conductors, that is the 3 group of twisted pairs in that cable, correct? 4 A. The illustration has text 5 indicating plastic insulated conductors with an 6 arrow to the group -- a group or bundle of 7 conductors, and based on the context in the 8 text, including the section headings 7.6.2.7 on 9 the prior page, saying summary of twisted pair 10 cable physical characteristics and the section 11 heading on page 313 above the image, one would 12 understand that the transmission media are 13 twisted pairs. 14 Q. You would agree that the twisting 15 of each individual pair is not visually 16 apparent from the figure at 7-3A, correct? 17 A. Figure 7-3A illustrates an example 18 of a cable type and points to plastic insulated 19 conductors, and one reading the text, based on 20 the text, would understand that that -- those 21 plastic insulated conductors are arranged as 22 twisted pairs.

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93 1 Q. Okay. Again, that was not an 2 answer to my question. My question was: You 3 would agree that the twisting of each 4 individual pair is not visually apparent from 5 what is shown in the figure at 7-3A, correct? 6 A. I would examine, and I view figure 7 7-3A in the context of the text, the figure -- 8 Q. I'm not asking about the text. I'm 9 just asking about the figure. 10 A. It is a figure illustrating plastic 11 insulated conductors. In the context of a 12 filling compound or in addition to filling 13 compound, nonhygroscopic dielectric tape -- 14 THE COURT REPORTER: I'm sorry 15 non -- 16 A. Nonhygroscopic dielectric tape 17 coated aluminum or copper shield in a 18 polyethylene jacket. 19 Q. Okay. That does not have anything 20 to do with my question. My question is: 21 Looking at the figure -- 22 A. Yes.	95 1 Q. Okay. So you would agree that 2 drawings, even though they may appear to show 3 straight wires, can actually be depicting 4 twisting pairs if the context makes it clear 5 that they're depicting twisted pairs, correct? 6 MR. HOEHNER: Objection to form. 7 A. Could you repeat the question, 8 please? 9 Q. I'll ask a different question. 10 MR. KOHLHEPP: Let's go to 11 Exhibit 1029. 12 Q. Exhibit 1029, it's titled "Electric 13 Cables Handbook, Third Edition." Do you 14 recognize this book, Dr. Eldering? 15 A. I believe I have seen this in the 16 context of this proceeding, this reference. 17 Q. Have you seen this reference 18 outside of the context of this proceeding? 19 A. I do not recall having seen it 20 outside the context of this proceeding. 21 Q. If you could, flip to page 32 of 22 the exhibit. It's a chapter entitled "Twisted
94 1 Q. -- you would agree that it is not 2 visually apparent from the drawing that what is 3 labeled plastic insulated conductors are 4 twisted pairs, correct? 5 A. The drawing indicates plastic 6 insulated conductors without reference to their 7 particular configuration within the cable. 8 Q. Okay, so you need the context of 9 the surrounding text to understand that it is 10 actually showing twisted pairs; is that 11 correct? 12 A. The figure 7-3A, indicating plastic 13 insulated conductors, when viewed in the 14 context of the accompanying text, including the 15 section heading 7.6, twisted pair transmission 16 media, and section heading 7.6.2.7, summary of 17 twisted pair cable physical -- 18 THE COURT REPORTER: I'm sorry, 19 point seven summary? 20 A. Of twisted pair cable physical 21 characteristics would indicate that figure 7-3A 22 utilizes twisted pairs.	96 1 Pair Telecommunications Cables." Do you see 2 that? 3 A. Yes, I do. 4 Q. Okay. And then, if you go to 5 page 33, there's a figure 55.1. Do you see 6 that? 7 A. Yes, I do see that figure. 8 Q. Okay, and it's a cross section of a 9 telecommunications cable, correct? 10 A. I believe that is accurate, yes. 11 Q. Okay. And it is a cross section of 12 a twisted pair telecommunications cable, 13 correct? 14 A. Could you repeat your question, 15 please? 16 Q. Figure 55.1 shows a cross section 17 of a twisted pair telecommunications cable, 18 correct? 19 A. Figure 55.1 describes a typical 20 telephone cable layout, and in the context of 21 this chapter, which is entitled "Twisted Pair 22 Telecommunications Cable," one would understand

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97 1 it to be referring to a twisted pair cable or a 2 cable assembly carrying twisted pair cables. 3 Excuse me. 4 Q. Okay. And do you agree that figure 5 55.1 shows what would have been a typical 6 telephone cable layout? 7 A. Well, figure 55.1, based on the 8 caption, says, typical telephone cable layout, 9 and I have no basis to dispute that in the 10 context of the chapter and context of the 11 entire publication, that it isn't typical. 12 Although, I haven't verified that. 13 Q. Okay. Do you have any basis to 14 dispute the characterization of that layout as 15 typical outside of the context of this 16 proceeding? 17 A. I do not. 18 Q. Are you familiar with twinax 19 cables? 20 A. I'm not sure what exactly you're 21 referring to. If you are referring to twin 22 lead, I am. I think it may be the same thing,	99 1 you familiar with a type of cable called 2 twinax? 3 A. I don't know if you're referring to 4 a particular brand or model. So I -- I don't 5 know, without further context or a reference, 6 exactly what you're referring to. 7 Q. Are you familiar with the term litz 8 wire? 9 THE COURT REPORTER: I'm sorry? 10 Q. Litz wire, L-I-T-Z. 11 A. I may have encountered that, but as 12 I sit here, I can't recall specific -- 13 specifics of that wire. 14 Q. Okay. So the term sounds familiar 15 to you, but -- 16 A. I may have heard it before. I 17 believe I've heard it before, but I don't know 18 in what context, and without any context and 19 where in the telecommunications system you're 20 talking about, I have no reference. 21 Q. Okay. Are you able to describe 22 what litz wire would look like?
98 1 but I'm -- I'm not sure. 2 Q. Okay. Does the term twinax mean 3 anything to you? 4 A. Could you repeat the question, 5 please? 6 Q. If I say a twinax cable, does that 7 mean something to you? Is that a term of art 8 in your field? 9 A. In which context, for telephone 10 antennas? 11 Q. I'm just -- you know, I'm not the 12 expert in this area. I'm just asking if I say 13 twinax cable, T-W-I-N-A-X, does that mean 14 something to you in the field of 15 telecommunications? 16 A. In the field of telecommunications 17 as I stated, there is a type of cable, a twin 18 lead cable, that's used in an -- typically, in 19 antennas, typically for television frequencies. 20 It may be called twinax, but I'm not -- I'm not 21 sure. I -- I refer to it as twin lead. 22 Q. Okay. So outside of twin lead, are	100 1 A. Without further context, no. 2 Q. I guess, what are you referring to 3 as further -- what would you need as far as 4 further context? 5 A. I don't know. The further context 6 could include description of words used in the 7 telecommunications system, whether you're 8 talking about telephone, television, cable 9 networks, and if you're referring to a 10 particular manufacturer or brand of cable. 11 Q. Okay. Not necessarily referring to 12 a -- a particular manufacturer or brand, but in 13 any of those contexts, telephone, television, 14 cable networks, is the term litz wire familiar 15 to you? 16 A. I can't recall anything specific 17 about litz wire as I sit here. 18 Q. Have you come across Mylar tape in 19 your work in the cable industry? 20 A. Yes, I have. 21 Q. Okay. And Mylar tape existed 22 before 1999, right?

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101 1 A. It's -- it's my belief that it did, 2 indeed, exist before 1999, yes. 3 Q. Okay. And would it usually come on 4 a roll? 5 A. Well, to my understanding and in -- 6 to -- in my experience, Mylar can come in a 7 number of forms, including sheets. It could 8 also be incorporated into a multi layer 9 product. It could come in a sheet or on a roll 10 depending on the application. 11 Q. Okay. So you're familiar with 12 Mylar tape, correct? 13 A. I'm generally familiar with Mylar, 14 and as I've stated, it could come in a number 15 of configurations, including being incorporated 16 into a tape. 17 Q. Have you ever used Mylar tape? 18 A. I have. To my recollection, I have 19 used tapes that contained Mylar or Mylar 20 backing. 21 Q. Have you used those tapes in 22 connection with cabling?	103 1 when I used a tape that had a Mylar backing. 2 I think we need a break. 3 MR. KOHLHEPP: Sure. If I could 4 ask one more set of questions, and then, 5 we can take a break. If you're really 6 hungry, we can also take a break right 7 now. 8 A. I'm not hungry. 9 MR. KOHLHEPP: Okay. 10 A. I have to run to the men's room. 11 MR. KOHLHEPP: Sure. We'll take a 12 break. 13 A. All right. I'll be back in less 14 than five minutes. How's that? 15 THE VIDEOGRAPHER: We are going off 16 the record. The time is 12:06 p.m. 17 (Whereupon, an off-the-record 18 discussion was held.) 19 THE VIDEOGRAPHER: We are back on 20 the record. The time is 12:11 p.m. 21 Q. Okay. Let's go to your 22 Exhibit 2001 declaration in the 095 matter, and
102 1 A. I may have. I can't recall 2 specifically as I sit here. 3 Q. Okay. And in your recollection of 4 using Mylar tape, you would agree it -- it was 5 flexible, correct? 6 A. I don't recall specifics. 7 Q. You don't recall whether it was 8 flexible? 9 A. I don't recall the application in 10 which I used it and whether or not I would have 11 considered that to be flexible. I mean, Mylar 12 can come in many configurations. 13 Q. I'm talking about Mylar tape? 14 A. It would depend on the 15 characteristics of the tape. 16 Q. And in your recollection of using 17 Mylar tape, were you able to unroll it? 18 A. I don't recall the specifics of the 19 use. 20 Q. So you don't recall whether you 21 were able to unroll the Mylar tape? 22 A. I don't recall the specifics of	104 1 there you're talking about the Roberts 2 reference, correct? I'm sorry, if you go to 3 paragraph 45, there you're talking about -- 4 A. Okay. 5 Q. -- the Roberts reference. 6 A. Beginning in paragraph 46, I think? 7 Q. Yes, 46. I'm sorry. 8 MR. KOHLHEPP: So let's also go to 9 the Roberts reference and give you a 10 copy. So let's start by looking at 11 Roberts Exhibit 1009. 12 A. Yes, I'm there. 13 Q. Okay. So -- and if we look at the 14 abstract, you'd agree that Roberts is 15 disclosing a telephone cable structure, 16 correct? 17 A. Roberts, based on the abstract, 18 describes an economical telephone cable 19 structure and method of making same. 20 Q. Okay, and then, in the second 21 sentence of the abstract it talks about "and 22 otherwise conventional telephone cable design."

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1 Do you see that? 2 A. I do see that, yes. 3 Q. Okay. In your view, does Roberts 4 disclose a conventional telephone cable design 5 other than the plastic coated metal foil strip 6 or tape divider? 7 MR. HOEHNER: Objection to form. 8 THE COURT REPORTER: You said 9 floral, metal floral, or metal -- 10 Q. Metal coated, coated. 11 A. Could you repeat your question, 12 please? 13 Q. Sure. So in the abstract, Roberts 14 describes its invention as an otherwise 15 conventional telephone cable design, and I'm 16 asking you, do you agree with Roberts 17 description that it's showing a conventional 18 cable design other than this metal coated strip 19 or tape divider that's the subject of its 20 invention? 21 MR. HOEHNER: Objection to form. 22 A. Well, I believe the language in the	105 1 floral strip or tape? 2 A. Foil strip or tape. 3 Q. Okay. And then, the next sentence 4 talks about measurements between pairs to 5 measure cross talk, correct? 6 A. That is the general description of 7 that sentence, so that's the following section, 8 yes. 9 Q. Okay. So what Roberts is concerned 10 about is the cross talk between pairs in an 11 otherwise conventional telephone cable; is 12 that -- 13 A. Roberts -- 14 Q. -- fair? 15 A. Roberts is directed to a system for 16 isolating straight line transmit and receive 17 wires in an unbalanced transmission system 18 using a conductive metal shield. Roberts 19 discloses -- 20 Q. Okay. Just -- sorry. To be clear 21 for the record, you're not reading from 22 Roberts. You're reading from your declaration,
106 1 abstract is clear in that Roberts is describing 2 a plurality of insulated electrical conductors 3 pairs of an otherwise conventional telephone -- 4 THE COURT REPORTER: I'm sorry, of 5 otherwise? 6 A. Sure. Let me start again, a 7 plurality of insulated electrical conductors 8 pairs of an otherwise conventional telephone 9 cable design are divided into at least two 10 portions by plastic coated metal foil strip or 11 tape. 12 Q. Okay. So do you agree with Roberts 13 characterization of its telephone cable as an 14 otherwise conventional telephone cable? 15 A. Well, I have no basis to dispute 16 Robert's characterization that he has taken a 17 plurality of insulated electrical conductors 18 pairs of an otherwise conventional telephone 19 cable design and then divided them into at 20 least two portions by plastic coated metal foil 21 strip or tape. 22 THE COURT REPORTER: You said	108 1 correct? 2 A. That is correct. 3 Q. Okay. So let's go back to the 4 abstract of Roberts. So the abstract is 5 talking about measurements between pairs of 6 cross talk, correct? 7 A. Roberts states, measurements 8 between pairs, divided by this plastic coated 9 metal foil of -- comma, of unwanted energy 10 transferred from one conductor to another by 11 means of mutual inductive, capacity, or 12 conductive coupling cross talk, shows greatly 13 improved properties over undivided cable pairs 14 or divided cable pairs of prior art. 15 Q. Okay. So when Roberts says, 16 measurements between pairs, I'm just trying to 17 understand how you're reading that. What -- 18 what are you understanding that that means? 19 A. It is my understanding and opinion 20 that Roberts is directed to a system for 21 isolating straight line transmit and receive 22 wires in an unbalanced transmission system

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109 1 using a conductive metal -- metallic shield. 2 Robert discloses dividing the individual 3 straight line conductors of a non-twisted pair 4 by placing a conductive, i.e., metallic shield 5 between them. 6 Q. Okay. I understand you're just 7 reading from your declaration again, but my 8 question is -- and that's because it's not 9 necessarily clear from your declaration, which 10 is why we had this deposition. When Robert 11 says, it's measuring -- it's taking 12 measurements of cross talk between pairs, I'm 13 trying to understand what -- how do you read 14 that? What does that mean? 15 A. Robert's discloses dividing the 16 individual straight line conductors of a 17 non-twisted pair into transmit and receive 18 straight line wires and placing a conductive 19 metallic shield between them, which would lead 20 to the measurements between the transmit and 21 receive pairs. 22 Q. Measurements between the transmit	111 1 dividing the individual straight line 2 conductors of a non-twisted pair, one conductor 3 being used for transmit and one conductor being 4 used for receive, and dividing them by placing 5 a conductive metallic shield between them. 6 Q. Okay. So then, we go back to that 7 abstract when it talks about measurements 8 between pairs of cross talk. What is that 9 referring to? 10 A. The measurements between the pairs 11 refers to the measurement of the cross talk 12 between the signals transmitted on the 13 individual straight line conductors on one side 14 of the shield which are isolated from the 15 single straight line conductors on the other 16 side of the shield and the consequential 17 reduction in cross talk due to the use of the 18 conductive or metallic shield between them. 19 Q. Okay. So you -- looking at the 20 abstract when it says measurements between 21 pairs, you read that as measurements between 22 each -- between each conductor of the pair?
110 1 and receive pairs, I guess that's the part I'm 2 not understanding. Are you reading between the 3 pairs as actually meaning between each wire of 4 the pair? 5 A. To put that statement in context, I 6 would refer to Roberts' column one, beginning 7 at line, I believe it's 22. The shield has the 8 effect of reducing so called near-end cross 9 talk since the weak attenuated currents coming 10 in -- 11 THE COURT REPORTER: Sorry, since 12 the weak? 13 A. Attenuated currents coming in at 14 repeater point are in a compartment of the 15 cable electrically shield from a large 16 amplified current entering the conductors in 17 the other side -- in the other compartment of 18 the cable. 19 Q. Okay, so -- right, so that's 20 referring to the transmit pairs on one side, 21 and then, the receive pairs on the other side? 22 A. That is referring to isolating by	112 1 A. The Roberts reference in general 2 and in the context of the abstract refers to -- 3 teaches the separating a non-twisted bundle of 4 transmit wires from a non-twisted bundle of 5 receive wires. 6 Q. Okay. So when it talks about the 7 pair, let's go to, for example, figure 17. So 8 what in figure 17 would be a pair? 9 A. Referring to the illustration of -- 10 or the annotated illustration of figure 17 11 above paragraph 54 of my declaration, the 12 correct illustration is on the right, and a 13 POSITA reading Roberts, would have understood 14 Roberts to teach individual wires separated by 15 a shield. 16 Q. Okay. I see the -- I see transmit 17 wires labeled -- that you have labeled there, 18 and receive -- what you have labeled receive 19 wires. My question is: What is the pair in 20 that figure? 21 A. The pair is the transmit and 22 receive wire -- wires as described by Roberts,

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113 1 which are divided by the plastic coated metal 2 foil. 3 Q. Okay. So in your view in Roberts, 4 the pair is just any one of what you have 5 labeled transmit 14 wires -- transmit wires 14 6 and any one of what you have labeled receive 7 wires 16? 8 MR. HOEHNER: Objection to form. 9 A. Could you repeat the question, 10 please? 11 Q. I'm just trying to understand what 12 the pair in your view would be in Robert's 13 figure 17, and that's not labeled on the figure 14 you referred to in your declaration, which is 15 why I'm asking the question. 16 A. Okay. Was there a question in 17 there? 18 Q. What do you consider to be the pair 19 in figure 17? 20 A. The pair in figure 17 is a transmit 21 wire for sending a signal in a first direction 22 in conjunction with a receive wire on the other	115 1 transmit wires 14. There's many there around 2 the order of 50, correct? 3 MR. HOEHNER: Objection to form. 4 Q. There's more than -- many more than 5 four or eight? 6 A. I believe that is accurate 7 statement, yes. 8 Q. Okay. 9 A. With reference to figure 17. 10 Q. And the wires in figure 17 in the 11 top half of Roberts cable, there's no shielding 12 between those individual wires, correct? 13 A. Could you repeat the question, 14 please? 15 Q. Sure. So in Roberts figure 17, it 16 discloses a metal shield that divides the cable 17 into two compartments, correct? 18 A. That is correct, yes. 19 Q. Okay. And each of those 20 compartments contains many individual wires, 21 correct? 22 A. That is correct, yes.
114 1 side of shield 15 for receiving a signal 2 transmitted in the opposite direction. 3 Q. Okay. So you would agree that 4 Roberts figure 17 discloses multiple pairs in 5 that single cable, correct? 6 A. Roberts discloses pairs comprised 7 of transmit wires 14 on one side of shield 15 8 in conjunction with receive wires 16 on the 9 opposite side of shield 15. 10 Q. Okay. And there are many of what 11 you have labeled transmit wires shown in figure 12 17, correct? 13 A. There are a plurality of transmit 14 wires illustrated in figure 17 and labeled as 15 element 14. 16 Q. And there's also many of receive 17 wires -- what you have labeled receive wires, 18 correct? 19 A. There is a plurality of receive 20 wires labeled as receive wires element 16 in 21 figure 17. 22 Q. So there are what you have labeled	116 1 Q. Okay. Roberts does not disclose 2 any shielding between the individual wires in 3 one of those compartments, correct? 4 A. Within each compartment, there are 5 plurality of straight line wires which are 6 insulated but there is no disclosure of 7 additional shielding beyond the insulation. 8 Q. So if we also go to your paragraph 9 145 in Exhibit 2007 from the 095 -- 10 A. Yes. 11 Q. And that's where you have your 12 diagram of electromagnetic emission. Do you 13 see that? 14 A. That is correct, yes. 15 Q. Okay. So if we just pick a single 16 wire in the top compartment of Roberts figure 17 17, would that correlate with what you have 18 labeled as single wire in your diagram at 19 paragraph 145? 20 A. Could you repeat the question, 21 please? 22 Q. Sure. So I believe you've

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117 1 explained that in your view, the top half of 2 Roberts cable contains a bundle of transmit -- 3 of straight transmit wires 14, correct? 4 A. That is correct, yes. 5 Q. Okay. So looking at one of those 6 transmit wires 14, would its emission, 7 electromagnetic emission be similar to what you 8 show and label as single wire in your diagram 9 on paragraph 145? 10 A. Yes. The -- with respect to the 11 diagram in 145, the single wire could be 12 understood to illustrate a straight -- isolated 13 straight wire within a bundle such as transmit 14 wires 14. 15 Q. Are you familiar with the term 16 common mode transmission? 17 THE COURT REPORTER: I'm sorry, 18 common? 19 Q. Common mode. 20 A. Yes, I am. 21 Q. What is common mode transmission? 22 A. Common mode transmission would be	119 1 phenomena that occurs when differential 2 transmission is used that due to the nature of 3 the differential transmission and the reception 4 thereof, results in common mode -- excuse me, I 5 want to correct the term. I think common mode 6 rejection, the actual measurement of which is 7 common mode rejection ratio, is a measure of 8 how a differentially transmitted signal becomes 9 less susceptible to a common interfering 10 signal. 11 Q. Okay. So in the field of 12 telecommunications, is there such a thing as 13 common mode transmission? 14 A. It -- it could be referred to as 15 common mode, but I'm afraid we're going to 16 start confusing common mode -- what I would 17 prefer to refer to it as -- and I think it's 18 more accurate to refer to it as unbalanced 19 transmission. There's absolutely no confusion 20 when we talk about a single wire transmitting a 21 signal. I'm going to call it an unbalanced 22 transmission as opposed to two wires used in
118 1 used in contrast to differential transmission 2 to indicate that the signal is being 3 transmitted simply with respect to a reference, 4 typically ground, as opposed to transmitting a 5 signal in a differential manner with respect to 6 an opposite phase signal. 7 Q. Okay. So in your view, is Roberts 8 disclosing something that is like common mode 9 transmission? 10 MR. HOEHNER: Objection to form. 11 A. Well, I believe I would need some 12 clarification, but the answer I've given you 13 with respect to common mode was with the 14 understanding, you're differentiating it 15 between differential transmission. If you are 16 talking about common mode noise rejection, that 17 is something different that is used within 18 differential transmission, so I don't want to 19 be confusing terms or issues here. 20 Q. Okay. What is common mode noise 21 rejection? 22 A. Common mode noise rejection is a	120 1 differential mode, and as I've explained, in 2 differential mode, that transmission will 3 exhibit something called common mode rejection 4 or common mode rejection ratio. So I'm just 5 trying to avoid any confusion. It would be my 6 strong preference. My testimony is that to 7 discuss transmission on a single wire, we would 8 call it an unbalanced transmission. 9 Q. Okay. So in your view, is Roberts 10 operating as an unbalanced transmission? 11 A. Robert is directed to a system for 12 isolating straight line transmit -- 13 THE COURT REPORTER: I'm sorry, 14 Roberts is directed to a system? 15 A. For isolating straight line 16 transmit and receive wires in an unbalanced 17 transmission system using a conductive metal 18 shield. 19 Q. Okay. So have you ever seen in -- 20 and I'm talking about just outside of this 21 proceeding in your experience as a -- a person 22 in the telecommunications industry. Have you

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121 1 ever seen a telephone cable like Roberts, so 2 meaning many conductors bundled together 3 without individual shielding between each 4 conductor that operates an unbalanced 5 transmission? 6 MR. HOEHNER: Objection to form. 7 A. Could you repeat the question, 8 please? 9 Q. Sure. So in your experience as 10 someone of skill and telecommunications 11 industry, have you ever seen a telephone cable 12 like Roberts, and by like Roberts, I mean with 13 many conductors bundled together without 14 individual metallic shielding between each 15 conductor that operates in unbalanced 16 transmission? 17 MR. HOEHNER: Objection to form. 18 A. Roberts is a specific cable 19 directed to a system for isolating straight 20 line transmit and receive wires in an 21 unbalanced transmission system using a 22 conductive metallic shield, and unbalanced	123 1 operates in unbalanced transmission? 2 A. Well, Roberts is a specific example 3 of a cable using an unbalanced transmission -- 4 Q. Out -- outside of Roberts. I'm not 5 asking, you know, what's in your declaration. 6 I'm just asking in your capacity as a person of 7 skill in the art, based on your experience, 8 sitting here today, have you ever seen a 9 telephone cable that is like Roberts, so not a 10 coaxial cable, that operates an unbalanced 11 transmission? 12 A. I have seen unbalanced cables and 13 utilized them in telecommunications systems, 14 and Roberts is a specific example of such a 15 cable. I have not personally constructed a 16 telecommunications system with a cable such as 17 that shown in Roberts. 18 Q. So can you recall a specific 19 example of using a cable that is constructed 20 like Roberts that operates an unbalanced 21 transmission? Is that what you're saying? 22 A. Could you repeat the question,
122 1 transmission systems are used in 2 telecommunications in my experience. 3 Q. With a cable like Robert's meaning, 4 many bundled conductors without shielding 5 between the individual conductors? 6 MR. HOEHNER: Objection to form. 7 Q. I mean, I'm just -- I'm assuming 8 you're thinking of coaxial cable. Is that what 9 you're thinking? 10 A. I'm not thinking of anything in 11 particular. 12 Q. Oh, okay. Well, you said you're 13 aware that cables are used in unbalanced 14 transmission system in your experience. 15 A. Unbalanced transmission systems are 16 used in telecommunications and Roberts is a 17 specific system for isolating straight line 18 transmit and receive wires. 19 Q. Okay. I -- I understand what your 20 declaration says. My question was and is: 21 Have you ever seen a telephone cable that is 22 like Roberts, so not a coaxial cable, that	124 1 please? 2 Q. Are you saying that you do recall a 3 specific example of using a cable or coming 4 across a cable that is constructed like Roberts 5 that operates an unbalanced transmission? 6 MR. HOEHNER: Objection to form. 7 A. I believe my statement was that I 8 have seen and utilized unbalanced cables in 9 telecommunications, and Robert's is an example 10 of an unbalanced system. 11 Q. Setting -- setting aside Roberts. 12 A. Now, I'm confused because you're 13 basing your question on Roberts, and you said, 14 set aside Roberts. So I -- I can't -- 15 Q. I'm just saying Roberts is an 16 example. I don't want -- 17 A. Okay. 18 Q. I want you to set aside Roberts as 19 an example. 20 A. Okay. 21 Q. You just testified I have seen and 22 utilized unbalanced cables in

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125 1 telecommunications, and my question is: Were 2 any of those unbalanced cables like Roberts? 3 A. You -- you just asked me to set 4 Roberts aside. 5 Q. No, you said Robert's is an 6 example. I don't want you to use Roberts as 7 your example to my answer. I want you to tell 8 me, have you seen or used any unbalanced 9 telephone cables that are configured like 10 Roberts, meaning not a coaxial cable? 11 A. I have not personally constructed a 12 telecommunications system with the particular 13 cable exemplified by Roberts. 14 Q. Okay. Have you personally seen or 15 come across a telecommunications cable that 16 operates an unbalanced transmission that is 17 configured like Roberts? 18 MR. HOEHNER: Objection to form. 19 A. Again, I have not personally 20 developed or worked on an unbalanced 21 communication system with the specific 22 configuration disclosed in Roberts.	127 1 Exhibit 2005. 2 Q. So Dr. Eldering, looking at 3 Exhibit 2005, my question is: You would agree 4 that the embodiments of the patent at 5 Exhibit 2005 each have either the individual 6 conductor or the conductor pair shielded from 7 every other conductor or conductor pair, 8 correct? 9 A. I will -- I will confirm that. One 10 second, please. Could you repeat your 11 question, please? 12 Q. You would agree that the 13 embodiments shown in Exhibit 2005 each have 14 either the individual conductor or the 15 conductor pair shielded from every other 16 conductor or conductor pair, correct? 17 A. I can't -- I will spend more time 18 on the reference, if you like, to confirm about 19 all the embodiments, but I can't do -- but I do 20 see there are embodiments such as that of 21 figure two, which illustrate a cable 22 arrangement --
126 1 Q. And fair to say that you are also 2 not personally specifically aware of any 3 example of an unbalanced communication system 4 with a configuration like that disclosed in 5 Roberts? Again, not asking about what's in 6 your declaration. I'm just asking about what's 7 in your head and your experience. 8 A. I have personally not constructed 9 nor did I utilize a cable with the specific 10 configuration of Roberts in my experience in 11 telecommunications. 12 MR. KOHLHEPP: Let's take a break. 13 So I do have one more, sort of, related 14 set of questions. We can go off the 15 record. 16 THE VIDEOGRAPHER: We are going off 17 the record. The time is 12:57 p.m. 18 (Whereupon, an off-the-record 19 discussion was held.) 20 THE VIDEOGRAPHER: We are back on 21 the record. The time is 1:47 p.m. 22 MR. KOHLHEPP: Let's go to	128 1 THE COURT REPORTER: I'm sorry, 2 which illustrating? 3 A. Illustrating a cable arrangement 4 having a single insulated jacketed conductor in 5 each electromagnetically isolated envelope and 6 an embodiment such as shown in figure three, 7 illustrating a cable arrangement having a 8 plurality of insulated jacket conductors in 9 each electromagnetically isolated envelope. 10 THE COURT REPORTER: I'm sorry, 11 in -- insulated jacket conductors in? 12 A. In each electromagnetically 13 isolated envelope. 14 Q. Okay. Let's go to paragraph 162 15 and 163 of Exhibit 2007 in the 095 matter. And 16 again, we're in your declaration, correct? 17 A. That is correct. I'm in the 195 18 declaration. I'm at paragraphs 162 and 163. 19 Q. And on -- above paragraph 163, you 20 reproduce a figure from Exhibit 2005, correct? 21 A. That is accurate, yes. 22 Q. Okay. So you would agree that in

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129 1 that figure, figure three from Exhibit 2005, 2 each pair of conductors is shielded from every 3 other pair of conductors, correct? 4 A. As described by Lemke, figure three 5 is a sectional view similar to figure two, 6 illustrating a cable arrangement having a 7 plurality of insulated jacket conductors in 8 each electromagnetically isolated envelope. 9 Q. Okay. So part of the purpose of 10 the deposition is not to have you read to me 11 from the references in your declaration. We 12 have read that. It's to understand what your 13 understanding is when you're providing your 14 opinions, okay? Do you understand that? 15 A. Yes. 16 Q. Okay. So my question to you was: 17 You would agree that in figure three from 18 Exhibit 2005, that cable has each pair of 19 conductors shielded from every other pair of 20 conductors, correct? 21 A. It is my understanding and -- 22 understanding and opinion that figure three	131 1 on each side of the divider. 2 Q. Okay. While in Lemke figure three, 3 there are -- it shows only two insulated 4 conductors in each compartment of the divider, 5 correct? 6 A. The figure three of Lemke in the 7 context of the Lemke patent illustrates two 8 wires, which is consistent with the description 9 of figure three as having a plurality of 10 insulated jacket conductors in each 11 electromagnetically isolated envelope. 12 Q. Okay. You keep reading from the 13 patent to me, and my question is -- I'm not 14 asking about the figure three that you chose to 15 reproduce from Exhibit 2005. Do you understand 16 that? 17 A. I understand that figure three is 18 to be read in the context of the text 19 accompanying it. 20 Q. So do you think -- is it your 21 opinion that figure three intends to show more 22 than two conductors in each envelope?
130 1 illustrates a plurality of insulated jacket 2 conductors in each electromagnetically isolated 3 envelope. 4 Q. Okay. It illustrates two 5 conductors in each envelope, correct? 6 A. The figure in Lemke illustrates two 7 and is -- the figure three illustrates two 8 wires, and is described as a plurality of 9 insulated jacket conductors in each 10 electromagnetically isolated envelope. 11 Q. Okay. So we're looking at figure 12 three, which is the one you reproduced in your 13 declaration, and comparing that to Roberts 14 figure 17, which you have next to it in your 15 declaration, do you see that? 16 A. Yes, I do. 17 Q. Okay. So in Robert's figure 17, 18 there are many more than two conductors in a 19 single shielded envelope, correct? 20 A. There are a -- what I would 21 characterize as a bundle of spaced apart 22 straight line separately insulated conductors	132 MR. HOEHNER: Objection to form. 2 A. As I've stated, figure three 3 illustrates two conductors per 4 electromagnetically isolated envelope, which is 5 consistent with the description of figure 6 three, which refers to a plurality of insulated 7 jacket conductors in each electromagnetically 8 isolated envelope. 9 Q. Okay. Let's -- and again, my 10 question is focused on what the figures that 11 you reproduced in your declaration here show, 12 okay? Do you understand that? 13 A. Yes, I do. 14 Q. Okay. So let's take a single 15 conductor from the upper envelope in Roberts 16 figure 17, okay? Do you understand that? 17 A. Yes, I do. 18 Q. Okay. And then, we'll also look at 19 a single conductor from Lemke's figure three, 20 okay? 21 A. I'm following you so far. 22 Q. Okay. Would you expect the single

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133 1 conductor in Roberts figure 17 to experience 2 significantly more cross talk than a single 3 conductor in Lemke's figure three? 4 MR. HOEHNER: Objection to form. 5 A. I -- I'm not sure I understand the 6 question. 7 Q. We're just looking at -- so going 8 back to the figure at paragraph 145 in 9 Exhibit 2007, okay? 10 A. Yes. 11 Q. Okay. So there, you illustrate the 12 emission that would be caused by various 13 configurations of -- of wires, right? 14 A. That is correct, yes. 15 Q. Okay. And you show a mag -- 16 magnetometer. I don't know if I'm saying that 17 right. How -- 18 A. Mag -- mag -- magnetometer. 19 Q. Magnetometer, thank you. You show 20 a magnetometer measuring the emission from each 21 of those configurations, correct? 22 THE COURT REPORTER: I'm sorry,	135 1 other surrounding wires in that same bundle, 2 correct? 3 A. A single wire in Roberts would be 4 subject to the emissions of the surrounding 5 wires. That is correct. 6 Q. And the sum total of the emissions 7 felt by a single wire in one of the bundles of 8 Roberts would be significantly more than the 9 emissions felt by a single wire in Lemke's 10 figure three, correct? 11 A. Well, first of all, there are more 12 wires illustrated in the Roberts cable than in 13 the Lemke cable so that one could understand 14 the Roberts cable, a single wire, as being 15 subject to signals from other wires on the same 16 side of the dividers, those other wires being 17 transmitting signals in the same direction. 18 THE COURT REPORTER: I'm sorry, 19 those other? 20 A. Wires transmitting signals in the 21 same direction. 22 Q. And would a person of ordinary
134 1 measuring the? 2 Q. Emission. 3 A. There would be measurement of the 4 magnetic field, yes. 5 Q. Okay. So what I'm asking you is if 6 you put that magnetometer next to a single wire 7 in the bundle, that's shown in Roberts figure 8 17, and you also put a magnetometer next to a 9 single wire in the Lemke cable as shown in 10 figure three, would a person of ordinary skill 11 expect to see much more emission in the Roberts 12 configuration? 13 MR. HOEHNER: Objection to form. 14 Q. Are you thinking? 15 A. I'm thinking. 16 Q. Okay. 17 A. Yes. The emissions from a wire in 18 Roberts could be different or the same from a 19 single wire in Lemke depending on the 20 transmission mode. 21 Q. Okay, but a single wire and Roberts 22 would be receiving emissions from all of the	136 1 skill expect those emissions from the other 2 wires within the same bundle transmitting in 3 the same direction to be a problem for 4 communications? 5 A. Because the signals are being 6 transmitted in the same direction, it is the 7 case that the signals start out at a high level 8 of transmit power and are somewhat attenuated 9 down the line, but most importantly at the 10 receive end, those signals from one bundle are 11 isolated from the strong signals in the other 12 bundle which is at the receive end of the first 13 bundle, which happens to be the transmit end of 14 the second bundle but are -- the bundles are 15 isolated from each other by the shield 15. 16 Q. Okay. So you're talking about, I 17 think, two different things there. So one, 18 there's cross talk between the bundles in 19 Roberts, right? 20 A. But the -- Roberts is designed to 21 minimize the cross talk between the bundles. 22 Q. Yes and that's what the shield in

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137 1 Roberts is intended to do, correct? 2 A. I would say that that is an 3 accurate statement, yes. 4 Q. Okay. But there's also cross talk 5 within the bundles of Roberts, correct? 6 A. There can be, yes. 7 Q. Would you expect there to be? 8 A. Yes, with the understanding that if 9 one is -- all of the signals in the one bundle 10 are transmit signals, then the levels at which 11 they start out with are similar in size. 12 Q. Okay. But there would be cross 13 talk within one of the bundles of Roberts, 14 correct? 15 A. There could be, yes, but again, the 16 signals could be at a level such that the cross 17 talk is tolerable. And the critical parameter 18 being that when the signals from one bundle 19 that start at the transmit side are ended -- 20 end at the receive side, and they are somewhat 21 attenuated, they are isolated from the powerful 22 signals on the -- in the other bundle because	139 1 can be cross talk within the transmit bundle, 2 but the main consideration in Roberts is to -- 3 and the signal levels on the transmit side can 4 be adjusted such that the cross talk between 5 the wires in the bundle is acceptable, and the 6 shield prevents the more sensitive issue of 7 cross talk at the other end where the, for 8 example, top bundle is now being received, and 9 the bottom bundle is being used to transmit. 10 And the shield is preventing the strong signals 11 on the transmit bundle from bleeding into or 12 causing cross talk into the other bundle. 13 Q. Okay. Now, you're transitioning to 14 talking about cross talk between the bundles, 15 which I understand, but we're talking about 16 within a bundle. So you mentioned that within 17 a bundle, the signal can be adjusted so that 18 the cross talk between the wires in a single 19 bundle is acceptable. How is that adjusted? 20 A. By transmitting the signals with a 21 sufficient signal to noise ratio at the 22 transmit side and based on the transmit
138 1 the receive side of the top bundle, for 2 example, is going to become -- is the -- 3 corresponds to the transmit side of the bottom 4 bundle in -- as one example. 5 Q. Okay. But again, you sort of 6 transitioned to talking about cross talk 7 between the bundles, and I -- I'm just focused 8 on cross talk within a single bundle, okay? 9 A. Yes. 10 Q. Okay. So the shield in Roberts 11 between the bundles, that wouldn't really 12 significantly affect cross talk within a single 13 bundle, would it? 14 A. The shield of Roberts primary 15 function is to attenuate the cross talk between 16 the transmit bundle and the receive bundle. 17 Q. Okay. So even with cross talk 18 between the transmit bundle and the receive 19 bundle attenuated by the shield there could 20 still be additional cross talk within the 21 transmit bundle, correct? 22 A. As I have previously stated there	140 1 electronics, there will be a degradation of the 2 signal to noise ratio along the cable due to 3 cross talk within the bundle, but that signal 4 to noise ratio can be made controllable. And 5 as I stated, most importantly, once the signal 6 is received at the other end, as long as the 7 signal to noise ratio is sufficient within the 8 bundle, the Roberts shield prevents the other 9 transmit signal from interfering, and as such, 10 the signal to noise in the one bundle is 11 sufficient for reception of the signal. 12 Q. Does it get more difficult to 13 control for cross talk within a bundle with 14 more distance? 15 A. Could you repeat the question, 16 please? 17 Q. Does it get more difficult to 18 control for cross talk within a bundle with 19 more distance? For example, a five-foot cable 20 versus a kilometer long cable? 21 A. To the extent that the 22 configuration of the cable doesn't change along

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141 1 the distance, the primary impact will be simply 2 the attenuation of the signal over distance so 3 that over distance, the resistance in the 4 wires, for example, resistance as well as other 5 inductive or capacitive parameters can lead to 6 an attenuation of the signal, but not -- will 7 not necessarily lead to a degradation in the 8 signal to noise within the signal. 9 Q. Okay. So for a cable like shown in 10 Roberts figure 17, would you expect that cable 11 to have cross talk within acceptable functional 12 elements within a single bundle if that cable 13 was, say, a kilometer long? 14 MR. HOEHNER: Objection to form. 15 A. Could I have a copy of the Roberts 16 -- thank you. Could you repeat the question, 17 please? 18 Q. Would you expect a telephone cable, 19 like shown in Roberts figure 17, to have 20 acceptable cross talk within a single bundle if 21 that cable was a kilometer long? 22 MR. HOEHNER: Objection to form.	143 1 straight line conductors, with no shielding 2 between the individual conductors -- let me 3 back up. 4 If one were to take a bundle of 5 straight line transmit conductors with no 6 shielding between the individual conductors and 7 then replace that with a bundle of transmit 8 twisted pairs, would you expect that change to 9 reduce cross talk within the bundle? 10 MR. HOEHNER: Objection to form. 11 Q. Is that a difficult question? 12 A. I'm just trying to be precise. 13 Q. Well, I understand but part of 14 the -- this exercise is trying to understand 15 what your understanding of this area of art is. 16 A. Yes. 17 Q. Okay. So I guess, do you need more 18 clarification, or what are you looking for? 19 A. I'm sorry. Are you asking me what 20 I'm doing as I look through my report? 21 Q. I'm asking, you know -- it seems 22 like a fairly straightforward question, and I'm
142 1 A. There's no -- without any 2 understanding of the transmit power or the 3 attenuation of the cable, I couldn't make that 4 calculation. 5 Q. So you can't say? 6 A. I said, I can't make that 7 calculation without any data because you're 8 simply asking in the abstract. It would depend 9 on a number of parameters, perhaps most 10 importantly including the transmit power and 11 the inherent attenuation characteristics of the 12 cable. 13 Q. Have you ever seen a telephone 14 cable configured like Roberts figure 17 that is 15 used for distances of a kilometer or more? 16 THE COURT REPORTER: Of a 17 kilometer? 18 Q. Or more. 19 A. I don't recall in my experience 20 having dealt with such a cable over such a 21 distance. 22 Q. So if one were to take a bundle of	144 1 just curious what more information you need? 2 A. So are you asking me a different 3 question? 4 Q. No, I'm -- 5 A. Go ahead and ask me the question. 6 You want to ask me which information -- 7 additional information I need? I'm lost now. 8 Q. Here -- here's the question. 9 A. Okay. 10 Q. If one were to take a bundle of 11 straight line transmit conductors, like is 12 shown in the top half of Roberts cable -- are 13 you with me? 14 A. Yes. 15 Q. Okay. And then, replace that 16 bundle of transmit conductors, straight line 17 conductors, with a bundle of transmit twisted 18 pairs -- still with me? 19 A. Yes. 20 Q. Okay. Would you expect that change 21 to reduce the cross talk within that transmit 22 bundle?

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1 MR. HOEHNER: Objection to form. 2 A. Am I permitted to look at my 3 declaration? 4 Q. Do you need to look at your 5 declaration? 6 A. Am I -- I would like to look at my 7 declaration. 8 Q. Okay. Well, I'll direct you to 9 paragraph 145 of 2000 -- Exhibit 2007. I think 10 that may answer the question. 11 A. Yes. 12 Q. Does that answer the question? 13 A. In part, yes. 14 Q. Okay. And what is the answer? 15 A. I would like to look at my report 16 further. 17 Q. Do you agree that taking a bundle 18 of single wires -- a bundle of single transmit 19 wires and replacing them with a bundle of 20 twisted pair transmit -- strike that. 21 Let me rephrase. Do you agree that 22 replacing a bundle of single straight wires, a	145 1 MR. HOEHNER: Counsel, if he wants 2 to answer by reading from his 3 declaration, he's free to answer from 4 his declaration. 5 Q. Dr. Eldering, do you agree that 6 replacing a bundle of single straight wires, a 7 transmit bundle, with a bundle of transmit 8 twisted pairs would reduce cross talk within 9 that bundle? 10 MR. HOEHNER: Objection to form. 11 A. Replacing the individual wires of 12 Roberts with twisted wire pairs would lead to a 13 containment of the fields at the expense of a 14 bulky and less flexible cable because it would 15 use twice the number of conductors. 16 Q. By containment of the fields, you 17 mean, would lead to a reduction in cross talk 18 within the bundle, correct? 19 A. The use of twice as many wires in a 20 twisted wire configuration would result in the 21 containment of the fields within the bundles in 22 one direction in Roberts, which could lower
146 1 transmit bundle, with a bundle of transmit 2 twisted pairs would reduce cross talk within 3 that bundle? 4 MR. HOEHNER: Objection to form. 5 A. The use of -- 6 Q. Okay. I don't want you to read 7 from your declaration. I just want an answer 8 to my question. 9 A. Okay. Would you -- why don't you 10 go and ask your question again, and I'm going 11 to prepare and I -- 12 Q. I understand you're very 13 experienced at this, but the back and forth and 14 the right as the deposing party is to get your 15 understanding, not just to have you read from 16 your declaration, okay? 17 A. I -- I was, in fact, not going to 18 read from my declaration. 19 Q. Okay. 20 A. Why don't you ask me the question, 21 and I'll prepare. And to the extent I'm not 22 interrupted, I will answer your question.	147 1 cross talk but might not be a necessary 2 consideration in view of the signal to noise 3 ratio that would be utilized in Roberts. 4 Q. So you would agree that the reason 5 the telecommunications industry used twisted 6 pairs was to reduce cross talk between one 7 transmitting wire or pair and another 8 transmitting wire or pair, right? 9 MR. HOEHNER: Objection to form. 10 A. Could you repeat the question, 11 please? 12 Q. You would agree that the reason the 13 telecommunications industry used twisted pairs 14 was to reduce cross talk within a bundle of 15 transmitting conductors, correct? 16 MR. HOEHNER: Objection to form. 17 A. No. The origination of the use of 18 twisted wire pairs, which were -- the invention 19 is generally attributed to Alexander Graham 20 Bell -- was to create a balanced transmission 21 line for use on telephone poles. 22 MR. KOHLHEPP: Okay. Let's go to 148

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149 1 Exhibit 1018. It should be in your pile 2 there. 3 A. I have it. 4 Q. Okay. And Exhibit 1018 is the 5 Reeve handbook that we spoke of earlier. Do 6 you recall that? 7 A. Yes, I do. 8 Q. Okay. And you -- this is one that 9 you have a copy of yourself? 10 A. I do. 11 Q. Okay. And if you go to page 6, 12 section 3.5, do you see that? 13 A. Yes, I do. 14 Q. Okay. And it says, the second 15 sentence, "The twist is used to decrease 16 electromagnetic interference (EMI) due to cross 17 talk between adjacent pairs in a cable." Do 18 you see that? 19 A. I do see that, yes. 20 Q. Do you agree that that is an 21 accurate statement of the understanding in the 22 telecommunications art?	151 1 would the type of telephone cables shown in 2 Roberts be used for? 3 A. The Roberts cable could be used 4 within the telephone cable structure for either 5 voice or data signals and as discussed 6 between -- in Roberts, would be used between 7 repeaters. 8 Q. Okay. So we were talking earlier 9 about, you know, the telephone system in the 10 1960s, the trunk cable, the exchange cable, and 11 I believe you had mentioned the drop cable. Is 12 that the third part? 13 A. I -- I generally -- I described the 14 network in general terms and used those three 15 terms, including the drop cable. Although, 16 there's other sections of the 17 telecommunications network, but that's accurate 18 as to what I said, yes. 19 Q. Okay. So in your view, what part 20 or parts of that system would the Roberts cable 21 have been used for? 22 MR. HOEHNER: Objection to form.
150 1 MR. HOEHNER: Objection to form. 2 A. The description there is accurate 3 and consistent with what I described. The 4 initial invention was to use twisted wire pair 5 on telephone lines strung in the air. They 6 were not in bundles, but they could have been 7 viewed as adjacent and, in fact, were adjacent. 8 And the twisted wire pair was used to decrease 9 the electromagnetic interference -- 10 THE COURT REPORTER: I'm sorry, the 11 twisted wire pair were? 12 A. The twisted wire pairs were used to 13 decrease electromagnetic interference between 14 adjacent lines on the telephone pole, which is 15 consistent with the description here of the 16 adjacent pairs in a cable. 17 Q. In your view, what applications 18 would the type of telephone cable shown in 19 Roberts be used for? 20 A. Could you repeat your question, 21 please? 22 Q. In your view, what applications	152 1 A. The Roberts cable would have been 2 used for connections between repeaters. 3 Q. Okay. When you say connections 4 between the repeaters, are you -- is that 5 generally part of the trunk cable or the 6 exchange cable, the drop cable? What -- what 7 part of the network are you -- are we talking 8 about? 9 A. It could be part. Roberts, to my 10 knowledge, does not describe the particular 11 applications. It could be related to the trunk 12 but also related to undersea cables for 13 example, which may or may not -- 14 THE COURT REPORTER: I'm sorry, 15 related to under? 16 A. Undersea cables, which may or may 17 not be considered to be part of the trunk 18 system. 19 Q. Okay. Could it be part of the 20 exchange part of the telephone system? 21 A. The description in Roberts is 22 insufficient to determine if this cable was

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153 1 used in the exchange network. Although, it is 2 clear that Roberts discusses the cable being 3 used between repeaters, but there is no 4 discussion of what type of repeaters. 5 Q. Would Roberts have been the type of 6 cable that -- telephone cable that would have 7 typically been buried in the ground? 8 MR. HOEHNER: Objection to form. 9 Q. Again, not a memory test. I'm just 10 trying to get your understanding of these 11 references as someone who works in this area, 12 and I will tell you if you go to column 13, 13 line 56, it mentions the cable being buried in 14 the ground. 15 A. Specifically, he teaches the use of 16 a polyethylene grease-like material to allow it 17 to be buried and exposed to the weather 18 elements, so you -- I think you just answered 19 your own question that Roberts describes the 20 cable being buried. 21 Q. Okay. So would you agree that for 22 the type of telephone cable that would have	155 1 of higher diameters in larger conduits can 2 cause a tremendous increase in the cost of the 3 buried cable. 4 Q. So is it your opinion that the 5 increased size, cable size, due to using 6 twisted pairs in a Roberts-like cable is 7 something that would have dissuaded a person of 8 ordinary skill from using twisted pairs in 9 Roberts? 10 So again, you're looking through 11 your declaration for a fairly long time here, 12 but my question -- you earlier mentioned that 13 using twisted pairs in Roberts would increase 14 its cable size, right? 15 A. I did state that, yes. 16 Q. Okay. So my question is: Is it 17 your opinion that the increased cable size due 18 to using twisted pairs in Roberts would have 19 dissuaded a person of ordinary skill from using 20 twisted pairs in a Roberts-like cable? 21 A. I believe I have made a statement 22 related to that in my declaration, and I would
154 1 typically been buried in the ground, the cable 2 size or diameter would have been less of a 3 concern or consideration than for a telephone 4 cable used, for example, within a single 5 residential house? 6 MR. HOEHNER: Objection to form. 7 A. Could you repeat the question, 8 please? 9 Q. Would you agree that the type of 10 telephone cable that would have typically been 11 buried in the ground, the size or the diameter 12 would have been less of a concern or a 13 consideration than for telephone cabling used 14 within a single residential house? 15 MR. HOEHNER: Objection to form. 16 A. I would not agree with that 17 statement because buried cable -- a 18 consideration in buried cable is that it 19 frequently needs to run through conduits or run 20 through a conduit which is placed, for example, 21 under a highway, such that the diameter of the 22 cable becomes a consideration, and requirements	156 1 appreciate the ability to find that statement. 2 Yes. Well, excuse me. I don't know. I'm 3 sorry, would you read the question again, and I 4 will answer it directly. 5 Q. Is it your opinion that the 6 increased cable size due to using twisted pairs 7 in Roberts would have dissuaded a person of 8 ordinary skill in the art from using twisted 9 pairs in Roberts? 10 A. A person of ordinary skill in the 11 art would have been dissuaded to modify Roberts 12 by replacing each of its individual straight 13 line conductors with twisted pairs because 14 first of all, Roberts already provided a 15 satisfactory solution to cross talk issues 16 involving straight line conductors, and the 17 dramatic increase in size of the cable and 18 resulting inconveniences, both due to the size 19 and cost and the relatively stiffer cable 20 construction would have caused a POSITA to not 21 modify -- 22 THE COURT REPORTER: I'm sorry,

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157 1 would have caused? 2 A. Would have caused a POSITA to not 3 modify Roberts as such. 4 Q. Okay. You mentioned Roberts 5 already provided a satisfactory -- satisfactory 6 solution to cross talk issues, right? 7 A. I did state that, yes. 8 Q. Okay. So what is Roberts' solution 9 to cross talk within a transmit bundle? 10 A. The design of Roberts utilizes the 11 isolated single wires for transmission in one 12 direction and isolates them from the strong 13 signals at the receive side and relies on the 14 appropriate signal to noise and launched power 15 to make sure that the -- any cross talk between 16 the pairs in each bundle is at acceptable 17 levels such that the signal to noise at the 18 receive side is sufficient to recover the 19 signal. 20 Q. Okay. Does Roberts talk about that 21 anywhere? By that, I mean dealing with cross 22 talk within a single bundle?	159 1 THE VIDEOGRAPHER: We are back on 2 the record. The time is 2:58 p.m. 3 Q. Okay. Let's go to Exhibit 2001 in 4 the 095 matter, and let's go to paragraph 91. 5 So there, you're talking about the 866 German 6 patent, correct? 7 A. That is correct. 8 Q. Okay. And you have an excerpt from 9 an English translation of that patent at 10 paragraph 91, correct? 11 A. That is correct, yes. 12 Q. Okay. And in that excerpt, there 13 is some discussion of stranding the pairs. Do 14 you see that? 15 A. Yes, I do. 16 Q. Okay. So you would agree that in 17 that excerpt, the translator is using the word 18 stranding to indicate twisted, correct? 19 MR. HOEHNER: Objection to form. 20 A. It is my understanding and opinion 21 that the stranding or cabling referred to there 22 describes groups of wires, in particular, pairs
158 1 A. Roberts describes explicitly the 2 screening or shielding one transmitting group 3 of insulated electrical conductors resulting in 4 improved near-end cross talk properties, and as 5 a POSITA -- a POSITA would understand that 6 having solved that issue, Roberts -- the system 7 in cable of Roberts is tolerant in to the cross 8 talk within the transmit bundle or within the 9 receive bundle. 10 Q. So when you reference the improved 11 near end cross talk properties, again there, 12 you're talking about cross talk between 13 bundles, right? 14 A. That is correct. 15 MR. KOHLHEPP: Do you want to take 16 a quick break, or keep going? Break. 17 MR. HOEHNER: Let's take a quick 18 break. 19 THE VIDEOGRAPHER: We are going off 20 the record. The time is 2:44 p.m. 21 (Whereupon, an off-the-record 22 discussion was held.)	160 1 of isolated untwisted wires that are then 2 configured as pairs and as described in the 3 GMBH reference, can be configured in a helix 4 stranding or in an SZ stranding configuration. 5 Q. Okay. So in this paragraph that 6 you excerpt, the translator refers to stranding 7 in a helix or SZ stranding manner. You agree 8 that's referring to stranding in the twisting 9 sense rather than the multifilament wire sense, 10 correct? 11 A. The stranding in this context and 12 in this portion of the GMBH reference refers to 13 the alignment of groups of wires in a 14 particular configuration, which can be -- can 15 include, as it described, a helix stranding or 16 an SZ stranding. 17 Q. Okay. And helix or SZ stranding 18 would be a twisted configuration, right? 19 MR. HOEHNER: Objection to form. 20 A. The specific discussion describes 21 the stranding as being groups of wires, which 22 in the helix configuration would be crossed

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161 1 over one another periodically where a – two 2 pairs, for example, or more would be crossed 3 over each other or in an SZ configuration, 4 alternatingly right then left, and there is – 5 the helix and SZ descriptors are the most 6 accurate and what are put forth. It is the 7 case that there – it could be viewed as 8 twisting involved, but the specific twisting 9 results in a helix stranding or an SZ stranding 10 of pairs. 11 Q. You mentioned isolated conductors 12 in your earlier answer, I believe, correct? 13 A. I believed I used that term, yes. 14 Q. Okay. 15 A. Although, I may correct myself. I 16 think a more accurate term with respect to that 17 is individual conductors. I mean, they could 18 be – you could call them isolated, but they're 19 individual conductors of the pairs. 20 MR. KOHLHEPP: Okay. Let's go to 21 the 866 patent, the English translation 22 that's labeled Exhibit 1010.	163 1 statement, yes. 2 Q. Okay. And that is also the case 3 with -- for each of figures two, three, four, 4 and five, correct? 5 A. That would appear to be the case, 6 yes. 7 Q. Okay. So you would agree that 8 those figures do not show the insulated 9 conductors of a single pair isolated from each 10 other in the sense of physically spaced apart 11 from each other, correct? 12 MR. HOEHNER: Objection to form. 13 A. Could you repeat the question, 14 please? 15 Q. So you would agree that the figures 16 of the German 866 patent -- 17 THE COURT REPORTER: I'm sorry, of 18 the? 19 Q. The German 866 patent do not show 20 that the insulated conductors of a single pair 21 are isolated from each other in the sense of 22 physically spaced apart from each other,
162 1 A. Thank you. 2 Q. And let's go to page 2 in that 3 exhibit. Well, before we get there, let's go 4 to the figures of Exhibit 1010. So just 5 looking at figure one, you would agree that 6 figure one shows four pairs of insulated 7 conductors, correct? 8 A. Yes. To be exact, figure one – 9 the element one in figure one refers to a 10 conductor pair. Element two refers to each of 11 the two individual conductors within the pair, 12 and element three refers to the insulation 13 surrounding each of the individual conductors. 14 Q. Okay. And for each pair shown in 15 figure one, the insulation surrounding each 16 conductor touches or nearly touches the 17 insulation of the other conductor in that pair, 18 correct? 19 A. Are you referring to the individual 20 conductors of two? 21 Q. Yes. 22 A. Then, I would agree with that	164 1 correct? 2 MR. HOEHNER: Objection to form. 3 A. No, I wouldn't agree with that 4 statement at all. The data transfer cable 5 according to the invention shown in figure one 6 comprises – for pairs one, each consisting of 7 two isolated stranded copper conductors to – 8 or wires with the indication being that 9 they're – the conductors are isolated from 10 each other, so I would consider them isolated. 11 And the text supports that. 12 Q. They're not isolated in the sense 13 of physically spaced apart from each other, 14 correct? 15 A. That is not correct. They are 16 isolated. The conductors are isolated from 17 each other. 18 Q. Okay. I'm -- I'm talking about -- 19 okay. The combination of the conductor and its 20 insulation, that unit, a single conductor and 21 its insulation is not isolated in the sense of 22 physically spaced apart from the conductor and

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165 1 insulation unit of the other member of the 2 pair, correct? 3 MR. HOEHNER: Objection to form. 4 A. Well, the text is clear. My 5 understanding is that the -- 6 Q. I'm not asking about the text. I'm 7 asking about the figures. 8 MR. HOEHNER: Counsel, I'd let -- 9 let the witness finish answering his 10 questions before you cut him off, 11 please. 12 A. My understanding of the figures in 13 the context of the patent is that the stranded 14 copper conductors are isolated from each other 15 within the pairs. 16 Q. But that's not what the figure 17 shows, is it? 18 A. That's precisely what the figure 19 shows. 20 Q. But there's no -- the figures don't 21 show any physical space between the insulation 22 of one conductor and the insulation of the	167 1 that there is air between their respective 2 insulation coatings? 3 A. The -- 4 MR. HOEHNER: Objection to form. 5 A. The teaching of the GMBH reference 6 is that there are pairs and they consist of 7 stranded copper conductors and that those 8 conductors do not touch each other, which is -- 9 if you're an electron in the conductor, what 10 you care about is whether you can get to 11 another conductor or not, and the figure, which 12 is consistent with the text, shows that the 13 copper conductors are isolated from each other 14 and as such, cannot short out, and electrons 15 from one wire can't jump into the other wire. 16 Q. Okay. And that's also true of a 17 twisted wire pair, correct? 18 A. Could you repeat the question, 19 please? 20 Q. Okay. You're just explaining to me 21 how the insulation surrounding the metal 22 conductor in each of the wires in the pair
166 1 other conductor of the same pair, do they? 2 A. The figure illustrates the 3 conductive part, the two conductive parts 4 within a pair are isolated from each other, in 5 part, due to the insulation. 6 Q. Right they're isolated due to the 7 insulation that covers the metal conductor 8 part, correct? 9 A. The pairs each consist of two 10 isolated stranded conductors two or wires. 11 THE COURT REPORTER: Two wires? 12 A. Two -- each consisting of two 13 isolated stranded copper conductors two or 14 wires. 15 THE COURT REPORTER: Two or wires? 16 A. Two or wires. 17 MR. KOHLHEPP: Two as in the number 18 two. 19 Q. Okay. What I'm trying to 20 understand, is it your opinion that German is 21 disclosing and teaching that the conductors of 22 each pair are physically isolated in the sense	168 1 shown in the German 866 reference prevents 2 electrons from jumping from one wire to the 3 other, right? 4 A. Correct. 5 Q. Okay. Which is -- I understand is 6 the purpose of the insulation that commonly 7 surrounds wires, right? 8 A. Correct. 9 Q. Okay. So in a twisted wire pair, 10 the conductor part of each wire is insulated, 11 right? 12 A. That is correct. 13 Q. Okay. So the isolation of one 14 conductor from another conductor in a twisted 15 wire pair is the same as in the pairs shown by 16 the German 866 reference, correct? 17 A. Well, I think you're -- I mean, I'm 18 a little confused because it's a -- a basic 19 principle of electricity in that you might 20 remember the stories. People buy houses and 21 find out it has something called post and tube 22 wiring, which there's --

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169 1 THE COURT REPORTER: Called post? 2 A. Post and tube, which there is no 3 insulation on the wires. In which case, you 4 have to keep them physically separated. In the 5 context of these proceedings, there's a basic 6 assumption that we're going to use insulated 7 wire. I've not yet -- that I -- that I -- I 8 cannot recall a reference in this proceeding 9 where the wires were uninsulated and as such 10 insulation is a basic premise to keep the wires 11 from shorting out whether they be twisted, 12 laying next to each other -- 13 Q. Okay. 14 A. -- or unbalanced. 15 Q. So when you said that German 866 16 patent is teaching that the wires of each pair 17 are isolated from each other, you're not saying 18 it's teaching that there's physical air space 19 between them. You're just saying that they're 20 covered in insulation, correct? 21 And we can go look at it. The 22 sentence on page 2 of Exhibit 1010, the second	171 1 German reference is clear, and I refer, in 2 addition to what you have pointed out, the text 3 in the last paragraph, the bottom paragraph on 4 page 3 talks clearly about 4 pairs one, each 5 consisting of two isolated stranded copper 6 conductors two or wires. And the figure points 7 to the two wires or in the -- in the middle 8 part of figure one, there's two arrows coming 9 from two pointing at what looks like the center 10 part or towards the center part of the wires, 11 and then, it goes on to say that there is an 12 insulation three. And that's also labeled in 13 the middle figure. You can -- in the middle 14 part of figure one, you can see it very 15 clearly, the arrows pointing to what appears to 16 be the outer layer, and that would be 17 consistent with one's understanding that the 18 wire, the metallic part of the wires should not 19 touch. 20 Q. Right, but the insulating portion 21 of those wires can and does touch in the 22 figures in the German 866 patent, correct?
170 1 paragraph. It says, "data transfer cables of 2 this kind" -- 3 THE COURT REPORTER: I'm sorry, 4 data -- data transfer? 5 Q. "Data transfer cables of this kind 6 typically consist of four pairs of two stranded 7 isolated copper conductors or wires." 8 A. You're on page 2? 9 Q. Exhibit page 2 of 1010? 10 A. Right. Which paragraph? 11 Q. Second full paragraph towards the 12 top. 13 A. I'm with you, yes. I'm reading 14 that, yes. 15 Q. Okay. So when you say that German 16 866 patent teaches isolating the conductors of 17 each pair, you're just referring to the fact 18 that German shows the conductor part of each 19 pair covered in insulation, which therefore, 20 isolates the electrons from one conductor to 21 the other, correct? 22 A. Well, I believe the teaching of the	172 1 A. It -- it would appear to touch, and 2 from electricity or electrical engineering 3 standpoint, if the insulation is sufficient, 4 the -- they could -- they could touch without 5 detriment to operation. 6 Q. Okay. And the same is true in a 7 twisted wire pair, correct? The insulation of 8 each pair can and often would touch without 9 detriment to operation? 10 A. I think it would be fair to say 11 that in other configurations other than those 12 shown in the GMBH reference and in the context 13 of twisted wire pair, the two insulated wires 14 could touch, yes, without detriment to 15 operation. 16 Q. So let's go back to page 2. That 17 sentence, the first sentence of the second full 18 paragraph, it refers to cables having four 19 pairs of two stranded isolated copper 20 conductors or wires. Do you see that? 21 A. Yes, I do. 22 Q. Okay. The word isolated in that

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173 1 sentence, what does that modify? 2 A. As I understand it, the GMBH 3 reference teaches that there are 4 pairs one, 4 each consisting of two isolated stranded 5 conductors two or wires, which are conductor 6 pair element two, referring to each of the two 7 individual conductors within the pair and 8 element three, referring to the insulation 9 surrounding each of the individual conductors. 10 Q. Okay. That -- that sentence also 11 says or wires. What does that refer to? 12 A. The conductor pairs in the GMBH 866 13 are disclosed as consisting of either stranded 14 copper conductors or solid -- 15 THE COURT REPORTER: I'm sorry, 16 consisting of either? 17 A. Let's start again. The conductor 18 pairs in GMBH 866 are disclosed as consisting 19 of either stranded copper conductors or solid 20 wires. 21 Q. Okay. So going back to the 22 sentence on page 2 of Exhibit 1010 when it says	175 1 again. Is it fair to say that the word 2 isolated modifies both copper conductors and 3 wires? 4 A. The way I read this sentence that 5 you're asking me about is that is -- describes 6 a data transfer cable according to the 7 invention shown in figure one comprises four 8 pairs one, each consisting of two isolated that 9 is describing the stranded copper conductors 10 two as one type of wire or wires as the solid 11 type of wire. 12 Q. Okay. So in your view, the word 13 isolated is describing the fact that either the 14 stranded copper conductors two or the wires are 15 covered in insulation; is that accurate? 16 A. No, I believe what it refers to is 17 that they are individual wires and are in an 18 untwisted form. 19 Q. How does that have anything to do 20 with untwisted? Strike that. 21 If you go back to the sentence on 22 page 2, second full paragraph, where it says,
174 1 four pairs of two stranded isolated conductors 2 or wires, is it fair to say the word isolated 3 modifies both copper conductors and wires? 4 A. The pairs are shown as element one, 5 each consisting of two isolated stranded copper 6 conductors or wires, which can be understood as 7 particular type of wire. 8 Q. All right. So in your view, that's 9 referring to two alternative particular types 10 of conductive wire, right? 11 A. The conductor pairs in GMBH 866 are 12 disclosed as consisting of other either 13 stranded copper conductors or solid wires. 14 THE COURT REPORTER: Are 15 disclose -- I'm sorry, are consisting of 16 either? 17 A. Let me try again. The conductor 18 pairs in GMBH 866 are disclosed as consisting 19 of either stranded copper conductors or solid 20 wires. 21 Q. Okay. I don't think any of that 22 answered my question, so I'm going to ask it	176 1 four pairs of two stranded isolated copper 2 conductors or wires. Do you see that? 3 A. Yes, I do. 4 Q. Okay. Do you agree that there also 5 the word isolated modifies both copper 6 conductors and wires? 7 Okay. I want the record to reflect 8 that a fair amount of time has passed here 9 without any answer to the question. Is there 10 something I can clarify? 11 A. No. I just want to be exact, and 12 as such, I'm checking my report as I provided 13 an analysis on this topic. 14 Q. Okay. My question is directed to a 15 single sentence, and the question relates to 16 how you as a -- you have said you are a person 17 of ordinary skill in this art -- how you 18 understand or what you understand that sentence 19 to mean, okay? 20 A. Yes. 21 Q. Okay. So I'll ask it again. In 22 your opinion, does the word isolated modify

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177 1 both copper conductors and wires? 2 A. In the context of the GMBH 3 reference, it's my understanding that the 4 description of a data transfer cable according 5 to the invention as shown in figure one 6 comprises 4 pairs one, each consisting of two 7 isolated, which I understand to be individual, 8 either stranded copper conductors or wires. 9 Q. Okay. So isolated modifies each of 10 stranded copper conductors and wires, correct? 11 A. It is my opinion that the language 12 teaches individual copper conductors. 13 Q. So the wires are not isolated? 14 A. They are isolated and the language 15 refers to them as isolated to describe them 16 being individual stranded copper conductors or 17 wires. 18 Q. Okay. So the word isolated 19 modifies both copper conductors and wires, 20 correct? 21 A. In the context of that sentence, 22 and as shown in figure one, there are four-wire	179 1 copper conductors or wires. Do you see that? 2 A. I'm sorry, we're back at the second 3 paragraph on page 2? 4 Q. Yes. 5 A. I -- I'm with you. I'm there. 6 Q. Okay. So in that sentence, if I'm 7 understanding you correctly, it's your opinion 8 that the word isolated refers to both copper 9 conductors and wires, correct? 10 Okay. I don't know why you're 11 going back to your report. I'm asking you 12 about that sentence. I'm trying to just get 13 your understanding here, and as you know, we 14 have limited time. I'm entitled to answering 15 my -- answers to my questions. This is a 16 pretty straightforward one, and you can also 17 just say you have no opinion. I'm just asking 18 what your understanding is. You've offered 19 opinions on that sentence, so I will ask again. 20 The sentence, page 2 of Exhibit 1010, that 21 says, four pairs of two stranded isolated 22 copper conductors or wires. Do you see that
178 1 pairs. Each wire pair one, consisting of two 2 isolated, which I understand to be construed as 3 individual. Then, it goes on to say they are 4 stranded copper conductors two, which will 5 refer to a conductor made of individual 6 stranded conductor, as I've illustrated, or 7 wire, which I understand to be a solid wire. 8 Q. Okay. And each of those, the solid 9 wire and stranded wire options, you understand 10 German 866 to be saying they are isolated, 11 correct? 12 A. Well, they are within a pair so 13 that what the reference is teaching is that the 14 pair consists of the isolated conductors two or 15 wires. 16 Q. Okay. And that same sentence says, 17 isolated copper conductors or wires, correct? 18 A. It says stranded copper conductors 19 two or wires. 20 Q. Okay. If we go back to the 21 sentence on page 2, second full paragraph, it 22 says, four pairs of two stranded isolated	180 1 sentence? 2 A. Yes, I do. 3 Q. Okay. Does the word isolated refer 4 to each of the copper conductors or the wires? 5 A. The sentence describes a data 6 transfer cable typically consisting of four 7 pairs, and the pair, as I read this, comprises 8 two stranded -- one second, please. That 9 sentence teaches that the individual conductors 10 are comprised of stranded copper conductors or 11 solid wires, and the reference in its 12 entirety teaches stranding of all components -- 13 THE COURT REPORTER: I'm sorry, the 14 reference in its entirety? 15 A. Let me start again. That sentence 16 indicates that there are individual conductors 17 being comprised of stranded copper conductors 18 or solid wires and teaches stranding all of 19 components of the data transfer cable into 20 helical and SZ bundles. 21 Q. Okay. I -- I don't think that was 22 an answer to the question. Do I need to re-ask

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181 1 it? 2 A. Please. 3 Q. In this sentence on page two of 4 Exhibit 1010 -- 5 A. Yes. 6 Q. -- where it says, four pairs of two 7 stranded isolated copper conductors or wires, 8 do you see that? 9 A. Yes, I do. 10 Q. Does the word isolated modify each 11 of copper conductors or wires? 12 Again, I want to note for the 13 record, a fair amount of time is passing again. 14 A. The sentence on page 2, in my 15 opinion, refers to a data transfer cable, which 16 consist of four pairs of two, and then, it goes 17 on to say stranded isolated copper conductors 18 or wires, which I understand to be four pairs 19 of two individual either stranded conductors or 20 solid wires. 21 Q. So is that sentence telling you 22 that the copper conductors are isolated?	183 1 Asked and answered. 2 Q. Or do you read -- read it as 3 referring only to the conductors but not the 4 wires? 5 A. I don't understand that statement. 6 Q. Okay. You understand that in 7 sentence structure you can have -- 8 A. Yeah. 9 Q. -- an adjective -- 10 A. Yes. 11 Q. -- that modifies something that 12 follows it, okay? 13 A. Yes. 14 THE COURT REPORTER: That -- I'm 15 sorry, that modifies? 16 Q. Something that follows it. Okay. 17 A. Yes, I'm with you. 18 Q. Here you have a word isolated, 19 okay, and then some words that follow it, 20 conductor and wire, right? Are you with me? 21 A. Yes. 22 Q. Okay. So my question is: Is that
182 1 A. Could you repeat the question, 2 please? 3 Q. Is that sentence telling you that 4 the conductors are isolated? 5 A. It's indicative to me. It's my 6 opinion that they are individual copper 7 conductors of the -- either the stranded 8 configuration or solid wire type and that they 9 are individual wires that form a pair. 10 Q. So you would agree that the word 11 isolated refers to conductors, correct? 12 MR. HOEHNER: Objection to form. 13 A. Consistent with figure one, it is 14 my opinion that the reference teaches that the 15 copper conductors or wires are individual and 16 separated from each other. 17 Q. So in that sentence on page 2, when 18 it says, four pairs of two stranded isolated 19 copper conductors or wires, you would agree 20 that the word isolated refers to each of 21 conductors or wires, correct? 22 MR. HOEHNER: Objection to form.	184 1 sentence telling you that only the conductors 2 are isolated, or is it telling you that the 3 conductors are isolated and also if it's wires, 4 the wires are also isolated? 5 A. I'm not sure if I follow, but it's 6 clear to me that the reference teaches that the 7 stranded copper conductor or wire is described 8 as preferably having an insulation -- 9 Q. Okay. Now, you're -- 10 A. -- and that surrounds each of the 11 individual stranded copper conductor or wires. 12 Q. Okay. That's your answer? 13 A. Yes. 14 Q. Okay. Let me ask one more time. 15 We're looking at the sentence on the top of 16 page 2, second full paragraph. 17 A. Yes. 18 Q. It says, four pairs of two stranded 19 isolated copper conductors or wires. Do you 20 see that? 21 A. Yes, I do. 22 Q. Does the word isolated refer only

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185 1 to conductors, or does it refer to both 2 conductors and wires in that sentence? 3 A. It is my understanding that that 4 sentence describes four pairs of two stranded 5 isolated copper conductors or wires, which I 6 understand as individual stranded copper 7 conductors or wires. 8 Q. Okay. So my understanding of that 9 answer is that you read isolated to refer to 10 both conductors and wires; is that correct? 11 A. Well, again, in the context of the 12 GMBH reference in figure one, I read that 13 sentence to say – to describe data transfer 14 cables that consist of four pairs such as – 15 consistent – figure one shows four pairs, so 16 that's consistent and that each of the two – 17 four – each of the four pairs has two stranded 18 isolated copper conductors or wires, which are 19 shown as individual wires, two wires per pair 20 in figure one and labeled as element one being 21 a pair and element two being individual 22 conductors within insulation three. And so I	187 1 The word isolated, okay? 2 A. Yes. 3 Q. Does that modify each of the words 4 conductors and wires? 5 A. My understanding is that that 6 sentence describes – my opinion is that that 7 sentence describes four pairs, each of the 8 pairs has two individual wires that could be 9 stranded copper conductors or they can be solid 10 wires, and as such, the sentence, in my 11 opinion, can be interpreted and consistent with 12 figure one as describing individual wires 13 within pairs. Whether those wires be stranded 14 copper conductor wires or solid copper 15 conductor wires. 16 Q. When you say individual, is that a 17 reference to the word isolated in the German 18 866 patent? 19 A. It is my opinion that that sentence 20 is describing the individual copper conductors 21 or wires. 22 Q. And so you're reading the word
186 1 find that sentence to be consistent with – in 2 describing what is shown in figure one. 3 Q. Okay. That was a really long 4 statement that did not answer the question. 5 A. Okay. 6 Q. Can you please answer the question? 7 A. Could I have the question again, 8 please? 9 Q. I've asked it many times. 10 A. Okay. 11 Q. Are you able to answer that 12 question in an honest and straightforward way? 13 A. I'll do the best I can. 14 Q. Okay. 15 A. I am doing the best I can. It's a 16 precise – my testimony is supposed to be 17 precise, and as such, I'm trying to make it 18 that way. 19 Q. Well, I can tell. Let's take a 20 look one more time at that sentence. 21 A. Yes. 22 Q. And the question is a specific one.	188 1 isolated as meaning individual? 2 A. I believe that the teaching as a 3 whole in that sentence in conjunction with the 4 figures, and in particular figure one, teaches 5 that the – they are individual copper 6 conductors and that they can be in an – that 7 the – there is an individual copper conductor 8 that can be of the stranded configuration, 9 meaning it's comprised of individual filaments. 10 MR. KOHLHEPP: Do you want to take 11 a quick break or keep going? 12 THE COURT REPORTER: Break. 13 MR. KOHLHEPP: Quick break, all 14 right. Off the record. 15 THE VIDEOGRAPHER: We are going off 16 the record. The time is 3:56 p.m. 17 (Whereupon, an off-the-record 18 discussion was held.) 19 THE VIDEOGRAPHER: We are back on 20 the record. The time is 4:10 p.m. 21 Q. Dr. Eldering, have you ever worked 22 with a cabling machine?

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189 1 MR. HOEHNER: Objection to form. 2 A. I've worked with cabling machines. 3 I'm not sure in particular which kind of 4 machine you're talking about. 5 Q. Which kind of machines have you 6 worked with? 7 A. I've worked with cable spooling 8 machines and machines that are used in the 9 deployment of cable in the telecommunications 10 environment. 11 THE COURT REPORTER: I'm sorry, in 12 the? 13 A. In the deployment of cable in a 14 telecommunications environment. 15 Q. Have you worked with machines that 16 are used in the manufacturer of 17 telecommunications cable? 18 A. I have not worked, let's say, would 19 work on them. I've observed them working, but 20 I have not worked myself on such a machine. 21 Q. Does the term laying machine mean 22 anything to you?	191 1 A. Yes, I do. 2 Q. Okay. Have you ever been in a 3 copper conductor cable manufacturing facility 4 and seen a machine that looks similar to what 5 is shown at the top of page 9? 6 A. I have not seen this particular 7 type of machine. 8 Q. Okay. Is that also true for the 9 types of machines shown in the two photos below 10 on page 9? 11 A. I have not seen – personally seen 12 those particular types of machines. 13 Q. And if you go to page 10, have you 14 personally seen the type of machines shown on 15 page 10? 16 A. I have not personally seen those 17 types of machines in a factory environment or 18 otherwise. 19 Q. Have you seen, in your experience 20 in the field, spools of twisted wire supply 21 similar to what is shown on the top of page 9? 22 A. Page 9, I'm sorry. I'm not sure.
190 1 THE COURT REPORTER: I'm sorry, 2 riding machine? 3 Q. Laying. 4 A. It would depend on the context. I 5 don't know in which context you're referring to 6 that. 7 Q. In the context of 8 telecommunications cable manufacturing? 9 A. If you – if you give me more 10 information of a specific machine, I might be 11 able to tell you, but I – as I sit here, I 12 don't recall specifics of a laying machine. 13 MR. KOHLHEPP: Let's pull up 14 Exhibit 1016, which I think should be in 15 your stack there. It's actually not. 16 Q. So Dr. Eldering, do you recall had 17 you seen this guide prior to this proceeding? 18 A. I do not believe I have seen this 19 prior to this proceeding. 20 Q. Well, if you go to page 9, there at 21 the top of page 9, there's a drawing. Do you 22 see that?	192 1 I've seen spools of twisted wire pair cable, 2 but I'm not sure that I've seen exactly what's 3 depicted here as a twisted pair wire supply 4 spool. 5 Q. So you have seen spools of twisted 6 wire pair cable before in your career? 7 A. Yes, I have. 8 Q. Okay. Is that spools of a single 9 twisted pair or is that spools of cable 10 consisting of multiple twisted pairs? 11 A. Typically what – what I have 12 observed and utilized was spools of finished 13 twisted wire pair or finished cables comprising 14 multiple twisted wire pairs, typically four 15 twisted wire pairs within the cable. 16 Q. Okay. Do you have any knowledge of 17 how those finished cables comprising multiple 18 twisted wire pairs were typically manufactured? 19 MR. HOEHNER: Objection to form. 20 A. Could you repeat the question, 21 please? 22 Q. Do you have any knowledge of how

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193 1 those finished cables comprising multiple 2 twisted wire pairs that you just referred to 3 were typically manufactured? 4 MR. HOEHNER: Objection to form. 5 A. I have some knowledge of the 6 construction of such a cable based on use of 7 that cable and observation of the configuration 8 of the twisted wire pairs. 9 Q. Okay. Have you ever observed such 10 cables being manufactured? 11 A. I have not observed those 12 particular types of cables comprising four 13 twisted wire pairs being manufactured but have 14 used them once in a manufactured state. 15 Q. Okay. Have you observed cables 16 consisting of many, meaning 20 plus twisted 17 pairs, being manufactured? 18 A. I have not personally observed the 19 manufacturing of 20 plus pairs of twisted wire 20 pair cables being manufactured. 21 Q. Do you have an understanding of how 22 those larger cables with 20 plus pairs of	195 1 point in the past, correct? 2 A. That is correct, yes. 3 Q. Okay. How long would you say 4 you've been working as a full-time patent 5 consultant? 6 A. Well, I was in industry, I mean, 7 for a -- a number of years, which I could 8 calculate if you need it, but I left to start 9 my own businesses in 1998. And although some 10 of those businesses were actually in the 11 telecommunications field, a lot of the focus 12 was on patents, and so approximately 20 years 13 or 20 plus years in the patent field, focusing 14 largely on telecommunications patents but also, 15 working in other areas of technologies or other 16 technologies. 17 Q. So going back to your time in 18 industry, so talking about before 1998, did you 19 ever work on a project concerning copper 20 conductor cabling? 21 A. Yes, I did. 22 Q. Okay. What project was that?
194 1 twisted wire pairs were manufactured? 2 A. I have a general understanding of 3 how such cables comprising 20 plus twisted wire 4 pairs are constructed. 5 Q. Were they typically constructed by 6 drawing individual twisted pairs from spools of 7 twisted pair wire supply like shown on page 9? 8 A. Could you repeat the question, 9 please? 10 Q. Were they typically constructed by 11 drawing individual twisted pairs from spools of 12 twisted pair wire supply like shown on page 9? 13 A. I do not have personal knowledge of 14 the exact machinery and configuration but the 15 nature of the finished wire would suggest that 16 they are assembled starting, in part, on a 17 twisted pair wire supply such as that shown in 18 figure nine. 19 Q. You currently do patent related 20 consulting work full-time, correct? 21 A. Yes, I'd say that's accurate. 22 Q. And you worked in industry at some	196 1 A. I worked on a number of fiber to 2 the curb configurations, which involved the use 3 of fiber optics to bring signals to a point in 4 some instances in a building, in some instances 5 in a neighborhood, termination point in the 6 neighborhood, which was termed -- is termed the 7 optical network termination. And from that 8 optical network termination point, twisted wire 9 pairs were used to deliver -- or the services 10 were delivered to the homes over twisted wire 11 pairs. 12 Q. Okay. So the part you worked on 13 was the fiber to the curb configuration; is 14 that accurate? 15 A. No, that's not accurate. We -- I 16 was responsible in various aspects. I was 17 responsible for designing the system to bring 18 the signals from the network to the subscriber 19 and that would have included not only the fiber 20 optics, but there's something that's called the 21 line card that is used to generate a signal 22 that can be sent over twisted wire pair to the

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197 1 subscriber, various types of line cards, some 2 digital, some analog. 3 Q. So have you -- did you, during your 4 time in industry, ever work on designing a 5 twisted pair cable? 6 A. My work was focused on the 7 utilization of the twisted wire pair cables, 8 including matching the performance 9 characteristics of the cable to the electronics 10 used at each end, but I would have, and did in 11 those positions, utilize commercially available 12 cable as opposed to designing a cable from 13 scratch. 14 Q. So what types of commercial 15 available twisted pair cable do you recall 16 utilizing? 17 A. The majority of the instances used 18 a typical four-wire drop cable to the 19 residence, which was connected to a line card 20 on one end, in some instances to a receiver on 21 the other end, the subscriber end, and in some 22 instances directly to the customer analog	199 1 shielded from the other pairs? 2 A. In the applications that I recall, 3 they were not shielded from the other pairs. 4 Q. So it was just a bundle of four 5 twisted wire pairs within a single jacket? 6 A. As I recall, that was a common 7 telephone wire or telephone plant drop cable, 8 yes, but I would add to that to clarify that 9 there are other types of twisted wire pair 10 cables frequently used in data applications. 11 But that was not the particular application 12 that I worked on. 13 Q. So looking at your CV, you appear 14 to have a large number of patents. To your 15 recollection, were any of them about twisted 16 pair cables. I'm not asking you to look 17 through each one, but -- 18 A. No, I -- I -- I want to know. I 19 want to know. The -- there's a patent listed 20 on page 13 of my CV. It's patent number 21 5408525, which deals with a -- a diverter 22 interface between two telecommunications lines
198 1 telephone to provide what we call POTS or plain 2 old telephony service. 3 THE COURT REPORTER: Or plain old? 4 A. Plain old telephony service, also 5 known as POTS, capital P, capital O, capital T, 6 capital S. 7 Q. So you referred to a typical 8 four-wire drop cable. Can you describe that 9 more specifically, please? 10 A. I can try. The four-wire drop 11 cable is comprised -- typically comprised of 12 four twisted wire pairs encompassed in a 13 jacket, sometimes with a metallic shield, and 14 is run to the residence to provide adequate 15 number of lines even though the residence may 16 only use an individual pair. There are extra 17 lines, and some number of pairs, at least one, 18 is connected to electronics at one end and to 19 either electronics in the subscriber residence 20 or directly to the telephone jacks. 21 Q. In these four-wire drop cables were 22 the twisted wire pairs normally individually	200 1 in a station set, and as I recall, that was 2 directed at being able to switch between two 3 twisted wire pairs. So I -- that -- that is 4 the close -- that is a patent I recall that 5 dealt with twisted wire pairs. I don't 6 remember the specifics, except that it was 7 used -- I remember the context was to be able 8 to switch between, as I recall, a telephone 9 company supplied signal and a cable operator 10 signal, and there was, as I recall, a 11 mechanism -- came up with a mechanism to switch 12 over, perhaps in -- if one failed through 13 detection on the twisted wire pair. But that's 14 a high-level summary. 15 Q. Approximately, how many patents do 16 you have? 17 A. Over -- I mean, it says here 156, 18 but -- 19 THE COURT REPORTER: I'm sorry, 20 say -- 21 A. It says here on this CV, 156, but I 22 believe more may have been issued.

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201 1 Q. So is it fair to say that your 2 telecommunications experience has focused on 3 fiber-optic communications? 4 MR. HOEHNER: Objection to form. 5 A. No, that's not -- that's not 6 accurate. 7 Q. Okay. What has it focused on? 8 A. I started my work in the fiber to 9 the curb area, which dealt with the system 10 design, including the fiber and then 11 transmission to the subscriber over twisted 12 wire pair. 13 THE COURT REPORTER: I'm sorry, 14 over? 15 A. Over twisted wire pair. Then, I 16 moved to the cable industry, which was involved 17 in transmission of both video and voice signals 18 and data over the hybrid fiber-coax network, 19 which was fiber to coax, coax into the home, 20 and then both coax and twisted wire pair within 21 the home. 22 Q. When you refer to twisted wire pair	203 1 A. Yes. 2 Q. So there Yanagita -- 3 THE COURT REPORTER: I'm sorry, so 4 Larry Yanagita? 5 Q. Oh, I'm sorry. In the excerpt at 6 paragraph 65 that you quote, it refers to a 7 first invention thereof is an alternatingly 8 stranded -- sorry, an alternatingly twisted 9 cable wherein a large number of insulated wire 10 strands, or that wherein the insulated wire 11 strands are twisted together, are laid while 12 twisting along the surfaces. Do you see that? 13 A. Yes, I do. 14 Q. Okay. So you would agree that is 15 describing an alternatingly twisted cable, 16 correct? 17 A. Well, what I believe it describes 18 from the figure in the context of the 19 translation is an alternatingly -- 20 alternatingly twisted cable with a bundle of 21 insulated wires that are laid on opposite sides 22 of a core material and twisted together along
202 1 within the home, generally, what type of cable 2 was that? 3 A. Well, that would have been 4 residential twisted wire pair, which is similar 5 to the twisted wire pair cable I described, 6 typically as I recall, having four pairs within 7 the cable. 8 MR. KOHLHEPP: Let's pull up 9 Exhibit 2001 in the 095 and go to 10 paragraph 65. 11 A. I'm there. 12 Q. Okay. So at paragraph 65, you were 13 talking about the Yanagita reference; correct? 14 A. That is correct. 15 Q. Okay. 16 MR. KOHLHEPP: And there was an 17 English translation submitted as 18 Exhibit 2000 -- I'm sorry, 1012. I'll 19 give you a copy of that. 20 Q. And then, at paragraph 65, you have 21 an excerpt from that English language 22 translation, correct?	204 1 the surfaces of the core in the longitudinal 2 direction. 3 Q. Okay. So you see it referring to 4 an alternatingly twisted cable, correct? 5 A. I see that language, yes. 6 Q. Okay. And it says, wherein a large 7 number of insulated wire strands. Do you see 8 that? 9 A. Yes, I do. 10 Q. And it says, or that wherein the 11 insulated wire strands are twist -- twisted 12 together, right? 13 A. Yes, I see that language. 14 Q. Okay. So you would agree that the 15 or there is giving two alternatives -- 16 THE COURT REPORTER: I'm sorry, you 17 would agree that the? 18 Q. The or is signaling two 19 alternatives, right? 20 MR. HOEHNER: Objection to form. 21 A. I'm sorry, would you repeat the 22 question, please?

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205 1 Q. You would agree that the or in the 2 clause I just read is signaling two 3 alternatives, correct? 4 MR. HOEHNER: Objection to form. 5 A. Well, I -- I interpret that as 6 further -- further description of the cable and 7 not an alternative. 8 Q. So even though it says or, you 9 would interpret that as not an alternative? 10 A. Well, I mean, it -- it -- this -- 11 this language -- I will -- I will read out loud 12 to answer your question. The present 13 inventions focuses on this point, and a first 14 invention thereof is an alternatingly twisted 15 cable, wherein a large number of insulated wire 16 strands. I don't see how the -- the following 17 or is, then, an alternative. It looks to me to 18 be a further description of the first 19 invention, wherein the insulated wire strands 20 are twisted together are laid while twisting 21 along the surfaces along both surfaces of a 22 core material.	207 1 THE COURT REPORTER: It describes 2 present? 3 A. The present invention focuses on 4 this point, and in first invention thereof is 5 an alternate -- alternatingly twisted cable, 6 wherein a large number of insulated wire 7 strands. Then, the sentence just comes to a 8 comma. So then, it says, or that wherein, 9 which I understand to be a further discussion 10 of the first invention thereof. The insulated 11 wire strands are twisted together or laid while 12 twisting along the surfaces along both surfaces 13 of a core material. Then, it goes on to 14 discuss the core material so that I read that 15 sentence -- in fact, it's one long sentence -- 16 as a discussion of the first invention thereof 17 with -- or referring to an alternate 18 description of the same invention. 19 Q. So you read that or clause as just 20 redundant of what is already stated in the 21 sentence; is that accurate? 22 MR. HOEHNER: Objection to form.
206 1 THE COURT REPORTER: I'm sorry, 2 along the? 3 A. Along both surfaces of a core 4 material, and then, it goes on to describe the 5 core material. 6 Q. Okay. So you don't read that or as 7 actually meaning or; is that accurate? 8 A. I -- I wouldn't -- 9 MR. HOEHNER: Objection to form. 10 A. I would not state it that way. 11 What I attempted to explain, and I'll explain 12 again -- and I believe we are working with a -- 13 I mean we are working with a translated 14 document so that the grammar may be awkward, 15 but if I was discussing something to you -- 16 with you, and I wanted to clarify what I meant, 17 I might say, something or, and then go on to 18 describe it in other terms to clarify it to 19 you. And it would appear to me that this 20 translation has resulted in a sentence 21 structure in which it describes the present 22 invention focuses on this point --	208 1 A. That is a mischaracterization of 2 what I've stated, but I'll be glad to explain 3 it again if that's helpful to you. 4 MR. KOHLHEPP: Let's take a look at 5 Exhibit 2014. 6 MR. HOEHNER: One zero one four, 7 1014? 8 MR. KOHLHEPP: 1014, correct. 9 Q. And this is the Jachimowicz 10 reference. Do you recall -- 11 THE COURT REPORTER: The? 12 MR. KOHLHEPP: Jachimowicz, 13 J-A-C-H-I-M-O-W-I-C-Z. 14 A. I -- there's no confusion, but I 15 think we call it the Jachimowicz reference. 16 Q. Fair enough. 17 A. Okay. 18 Q. We have the spelling correct on the 19 transcript. 20 So if you go to column two of line 21 46 -- 22 A. Yes.

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209 1 Q. And in that first sentence it talks 2 about a thin jacket of foam polyethylene 20 is 3 extruded over the bundle -- 4 THE COURT REPORTER: I'm sorry, 5 polyethylene? 6 Q. Polyethylene 20 is extruded over 7 the bundle. Do you see that? 8 A. I do see that, yes. 9 Q. Okay. And then, it says, the pairs 10 can be held together in the bundle in other 11 ways if desired as by applying a tape made of 12 foamed thermoplastic. Do you see that? 13 A. Yes, I do that -- see that, yes. 14 Q. Okay. And you've worked with 15 patents for quite a while, right? 16 A. Yes, I have. 17 Q. And you're familiar with the 18 concept of embodiments in a patent? 19 A. Yes, I am. 20 Q. Okay. So that second sentence 21 where it says, the pairs can be held together 22 in a -- in the bundle in other ways if desired	211 1 A. The Jachimowicz describes a cable 2 in which and what a POSITA would understand 3 that there has -- there is a jacket and whether 4 that be -- jacket be of extruded foam polymer 5 or a tape, needs to be -- is sufficiently rigid 6 to lock and bundle the pairs firmly together 7 making them unable to move. 8 Q. Okay. But you would agree that 9 Jachimowicz describes the jacket and the tape 10 as separate things, right? 11 A. Well, it's my opinion that a POSITA 12 would understand that Jachimowicz's jacket, 13 whether it be extruded foam polymer or tape, 14 locks and holds the plurality of conductor 15 pairs tightly together so that they cannot 16 move. 17 Q. Okay, but Jachimowicz never 18 describes the tape as a jacket, right? 19 A. It's my understanding and opinion 20 that a POSITA would understand Jachimowicz's 21 jacket to be either extruded from the polymer 22 or tape, which serves the purpose of locking
210 1 as by applying a tape of foamed thermoplastic. 2 That's referring to an alternative embodiment 3 to the extruded jacket, correct? 4 MR. HOEHNER: Objection to form. 5 Calls for a legal conclusion. 6 Q. Let me ask it a different way. You 7 would agree that in that paragraph, Jachimowicz 8 discloses two different ways of holding the 9 pairs together, correct? 10 A. Could you repeat the question, 11 please? 12 Q. Okay. We're talking about 13 Jachimowicz. 14 A. Yes. 15 Q. We're talking about that portion at 16 column two, lines 46 through 56 that I just 17 read? 18 A. Yes. 19 Q. Okay. In that paragraph, 20 Jachimowicz discloses two different ways of 21 holding the twisted wire pairs together, 22 correct?	212 1 and holding the plurality of conductor pairs 2 tightly together -- 3 THE COURT REPORTER: The plurality 4 of conductor? 5 A. Pairs tightly together so that they 6 cannot move. 7 Q. Was it known to use foam polymer in 8 data communications cables prior to 1999? 9 MR. HOEHNER: Objection to form. 10 A. Could you repeat the question, 11 please? 12 Q. Was it known to use foamed polymer 13 in data communications cables prior to 1999? 14 MR. HOEHNER: Objection to form. 15 A. Well, that's a -- in the context of 16 this proceeding and specifically the reference 17 that we're talking about, which is a reference 18 from 1973 issued in 1975, it describes a thin 19 jacket of foam polyethylene, which suggests to 20 me that and teaches that the use of, for 21 example, a thin jacket of foamed polyethylene 22 in the use -- was known to be useful or was

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213 1 used in a telecommunications cable. 2 Q. Okay. Okay. And it was also known 3 to use foamed polymer tape in 4 telecommunications cabling, correct? 5 MR. HOEHNER: Objection to form. 6 A. I don't know if you're referring to 7 a specific reference, so I – I don't know. 8 Q. I'm referring to the one you just 9 referred to, Jachimowicz. 10 A. In the Jachimowicz reference a 11 POSITA would understand that the jacket, 12 whether it be extruded foam polymer or a tape 13 with a supporting film could be used to hold 14 the pairs of conductors bundled firmly together 15 and unable to move. 16 Q. Have you ever used a Mylar backed 17 foamed tape in communications cabling? 18 MR. HOEHNER: Objection to form. 19 Asked and answered. 20 A. I can't recall specific use. I – 21 I have used – I recall having used Mylar. I 22 cannot recall the specifics of any tape that I	215 1 he describes it as a buffer system, includes a 2 plurality of portions, each of which comprises 3 a dielectric material. 4 Q. So you agree that Beggs teaches 5 that there may be a foamed polymer between 6 twisted pairs, right? 7 A. Well, Beggs discloses several 8 dis – excuse me, several different embodiments 9 of buffer systems for a cable that separates 10 pairs of conductors within the cable and that 11 the pairs of insulated conductors can be 12 enclosed individually by a portion of a buffer 13 system such as a tubular member, which in a 14 preferred embodiment – 15 THE COURT REPORTER: Wait, which 16 in? 17 A. – comprises – 18 THE COURT REPORTER: Which in? 19 A. Which in a preferred embodiment 20 comprises a polyvinyl chloride composition. 21 Q. And it actually says, can be an 22 expanded polyvinyl chloride plastic material,
214 1 would have used with a Mylar backer – backing. 2 MR. KOHLHEPP: Let's take a look at 3 Exhibit 1015. 4 Q. Do you recognize this exhibit? 5 A. Yes, I do. 6 Q. Okay. It's a reference called 7 Beggs, B-E-G-G-S, correct? 8 A. Yes. 9 Q. And you would agree that Beggs 10 teaches various buffers between twisted wire 11 pairs of insulated conductors, correct? 12 MR. HOEHNER: Objection to form. 13 A. Could you repeat the question, 14 please? 15 Q. You would agree that Beggs teaches 16 various buffers between twisted wire pairs of 17 insulated conductors, correct? 18 MR. HOEHNER: Objection to form. 19 A. Yes, Beggs uses – frequently uses 20 the word preforms, but I believe it's accurate 21 to say that they act – in general, he's 22 describing buffer – a buffer system. In fact,	216 1 correct? 2 A. Yes, Beggs further discloses that 3 in an alternative embodiment the tubular member 4 51 comprises an expanded polyvinyl chloride 5 plastic material. 6 Q. Okay. And then, it says that that 7 preform alternatively could be an S shaped 8 preform, correct? 9 A. I believe that figure seven of 10 Beggs discloses a – an S shaped – excuse me, 11 S shaped preform 58 that provides an individual 12 buffer for each conductor pair. 13 Q. Okay. And then, Beggs also teaches 14 that the S shaped preform can be replaced with 15 a tape of dielectric material, correct? 16 A. Specifically, Beggs discloses that 17 the S shaped preform 58 in figure seven may be 18 replaced with a tape, which is made of a 19 dielectric material and which is wrapped around 20 the conductor pairs to cause each pair to be 21 enclosed substantially in a dielectric portion 22 of the buffer system.

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217 1 Q. Okay. And you would agree that the 2 S shaped -- sorry, strike that. 3 If you go to claim 19 in Beggs, it 4 says, said buffer system is comprised of a 5 cellular polyvinyl chloride material, correct? 6 A. Yes, I see that in claim 19. Yes. 7 Q. Okay. You would agree that claim 8 19 does not limit that buffer system to any 9 particular one of the disclosed buffer systems 10 in Beggs, right? 11 MR. HOEHNER: Objection to form. 12 Calls for a legal conclusion. 13 A. Could you repeat the question, 14 please? 15 Q. Claim 19 does not say that the 16 buffer system is limited to any one of the 17 particular disclosed buffer systems in Beggs, 18 right? 19 MR. HOEHNER: Objection to form. 20 Calls for a legal conclusion. 21 A. Claim 19 addresses a buffer 22 systems, and those buffer systems could have	219 1 Q. Okay. 2 A. -- 537 declaration. 3 Q. You agree that the specification 4 says that the S shaped preform 58 in figure 5 seven may be replaced with a tape, correct? 6 I'm reading from column six, line 52 to 53? 7 A. I agree and see that the 8 specification where you have directed me states 9 that the S shaped preform 58 in figure seven 10 may be replaced with a tape which is made of a 11 dielectric material and which is wrapped around 12 the conductor pairs to cause each pair to be 13 enclosed substantially in a dielectric portion 14 of the buffer system. 15 Q. Okay. Are you aware that there 16 were some reexamination proceedings involving 17 the 095 and 537 patents that happened about 18 15 years ago? 19 A. I am aware of the existence of such 20 proceedings, yes. 21 Q. Are you aware that the patent 22 examiners in those proceedings have found that
218 1 various parameters, including different shapes, 2 including the circular enclosures of tubular 3 members 51 -- 4 THE COURT REPORTER: Of -- 5 including the -- including the circular? 6 A. Enclosures of tubular members 51, 7 the figure H shape of preform 55, and the S 8 shaped configuration of preform 58 as disclosed 9 in the specification and shown in Beggs figures 10 one, five, six, and seven. Although, the scope 11 of claim 19, which does not limit the shape of 12 the buffer system covers a buffer system that 13 was octagonal in shape -- 14 THE COURT REPORTER: I'm sorry, 15 that was? 16 A. Octagonal in shape, a POSITA would 17 not understand that Beggs taught a buffer 18 system that is in -- is octagonal in shape. 19 Q. Okay, and you were reading from 20 your declaration there, right? 21 A. I was reading from paragraph 162 of 22 my --	220 1 the foamed polymer claims in both the 095 and 2 537 patents were obvious in view of the 3 Giungue, G-I-N-G-U-E reference? 4 THE COURT REPORTER: I'm sorry, 5 G-I-N? 6 Q. G-U-E. 7 A. I am aware in general of the 8 existence of those proceedings. I'm not -- as 9 I sit here now, I cannot recollect -- recollect 10 the specifics that you have just mentioned. 11 Q. So sitting here today, you have no 12 specific recollection of whether the examiners 13 in those prior proceedings had found the foam 14 polymer claims in 095 and 537 patents obvious? 15 A. I did not perform an analysis of 16 those re-exam proceedings and do not have an 17 opinion with respect to those proceedings. 18 MR. KOHLHEPP: Let's take a break. 19 THE VIDEOGRAPHER: We are going off 20 the record. The time is 5:15 p.m. 21 (Whereupon, an off-the-record 22 discussion was held.)

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221 1 THE VIDEOGRAPHER: We are back on 2 the record. The time is 5:25 p.m. 3 MR. KOHLHEPP: All right. I'm 4 using a new exhibit here. So this 5 physical book, I'm going to call it 6 Exhibit 1068. 7 Q. So have you ever seen this book 8 before? 9 A. I did study German, but I'm pretty 10 sure I didn't see this book. 11 THE COURT REPORTER: Did you want 12 to mark this as a new exhibit? 13 MR. KOHLHEPP: Yeah, it's -- it is 14 marked. 15 THE COURT REPORTER: It is -- it's 16 premarked? 17 MR. KOHLHEPP: Yeah, yep. 18 THE COURT REPORTER: Okay. 19 MR. KOHLHEPP: We can go off the 20 record for a second. 21 THE COURT REPORTER: Okay. 22 THE VIDEOGRAPHER: We are going off	223 1 telecommunications industry? 2 A. Not that I recall. 3 MR. KOHLHEPP: All right. Let's 4 mark 1067. 5 THE COURT REPORTER: 1069? 6 MR. KOHLHEPP: It's actually marked 7 1067. 8 (Whereupon, the aforementioned 9 Petitioner's Exhibit 1067, book was 10 marked as for identification as of this 11 date by the Reporter.) 12 Q. And that is another book entitled 13 "German Technical Dictionary," correct? 14 A. That is correct. 15 Q. Okay. Do you recognize that book? 16 A. I do not. 17 Q. Okay. Would you have any reason to 18 doubt -- doubt the reliability of either of 19 these two books that have been marked as 1067 20 and 1068? 21 MR. HOEHNER: Objection to form. 22 A. I don't understand the context for
222 1 the record. The time is 5:26 p.m. 2 (Whereupon, an off-the-record 3 discussion was held.) 4 (Whereupon, the aforementioned 5 Petitioner's Exhibit 1068, book was 6 marked as for identification as of this 7 date by the Reporter.) 8 THE VIDEOGRAPHER: We are back on 9 the record. The time is 5:27 p.m. 10 Q. Okay. So what you've been handed 11 as Exhibit 1068, it's titled "German English 12 Technical and Engineering Dictionary," correct? 13 A. Yes, it is. 14 Q. Okay. Have you ever used a foreign 15 language technical or engineering dictionary in 16 your career? 17 A. I -- I can't recall. I've 18 certainly used foreign language dictionaries. 19 I can't recall any specific use of a technical 20 dictionary. 21 Q. Have you used foreign language 22 dictionaries as part of your work in the	224 1 the question. 2 Q. I'm just asking you, do you have 3 any reason to doubt the reliability of these 4 books? 5 MR. HOEHNER: Objection to form. 6 A. I have not examined the books. I 7 have no basis to confirm or doubt the contents 8 of the books. 9 MR. KOHLHEPP: Let's mark another 10 exhibit. So this is being marked 11 Exhibit 1069. 12 (Whereupon, the aforementioned 13 Petitioner's Exhibit 1069, document was 14 marked as for identification as of this 15 date by the Reporter.) 16 Q. And I will represent to you these 17 are quotes from Exhibits 1011 and Exhibits 1010 18 in this proceeding, and I will also give you a 19 copy of Exhibit 1011. And Exhibit 1011, I will 20 represent to you is a copy of the original 21 German 866 patent. Do you see that? 22 A. Yes, I do.

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225 1 Q. Okay. And you mentioned that you 2 did speak a little bit of German, correct? 3 A. Correct, conversational German. 4 Q. Okay. And I believe you put that 5 on your resume, right? 6 A. Correct. 7 Q. Okay. So in the -- the top column 8 of Exhibit 1069, there's two sentences. Do you 9 see that? 10 A. Yes, I do. 11 Q. Okay. One is from the original 12 German, the top one on Exhibit 1011, and then, 13 the below is from the English translation 14 that's labeled Exhibit 1010. Do you see that? 15 A. I see how they're marked and 16 understand what you have said, yes -- what you 17 stated. 18 Q. Okay. So would you agree that in 19 that -- that top row, the top sentence, the 20 translator translated the word V-E-R-S-E-I-L -- 21 THE COURT REPORTER: I'm sorry, the 22 word?	227 1 Q. Would you agree that in the top row 2 in the top sentence, the translator -- 3 translator translated the word 4 V-E-R-S-E-I-L-T-E-N as the English word 5 stranded? 6 A. I -- this is the first time I've 7 seen this, and I have no knowledge of what the 8 translator has been -- has done. You're 9 putting sentences in front of me and asking me 10 to make -- make a mapping, but I have a -- my 11 German language knowledge is limited to 12 conversational German. I have no basis to 13 confirm anything related to these translations. 14 Q. Okay. Could you go to 15 Exhibit 1068? 16 A. Yes. 17 Q. And if you go to page 1075 -- 18 A. Yes. 19 Q. -- and if you go to the word 20 V-E-R-S-E-I-L-E-N? 21 A. Yes. 22 Q. And do you see it's defined in that
226 1 MR. KOHLHEPP: It's spelled, 2 V-E-R-S-E-I-L-T-E-N. 3 THE COURT REPORTER: I'm sorry, S? 4 MR. KOHLHEPP: V-E-R-S-E-I-L -- 5 THE COURT REPORTER: I'm so sorry. 6 I'm sorry, say it again. 7 MR. KOHLHEPP: V-E-R-S-E-I-L-T-E-N. 8 THE COURT REPORTER: N? 9 MR. KOHLHEPP: Correct. 10 Q. As the English word stranded? 11 MR. HOEHNER: Objection to form, 12 and Dr. Eldering is an expert in 13 technical merits in this case. He's not 14 an expert in German translations. 15 Asking him to -- to translate this 16 German language, technical German 17 language, is out of scope and beyond his 18 expertise. He has no foundation to 19 answer these questions. 20 Q. Go ahead. 21 A. Could you repeat the question, 22 please?	228 1 book? 2 A. Yes. 3 Q. Can you read what it says? 4 A. The word verseilen, 5 V-E-R-S-E-I-L-E-N. It, then, says to twist, 6 strand, cable. 7 Q. Okay. 8 A. It further goes on to say zuzweien, 9 Z-U-Z-W-E-I-E-N, to twin. 10 Q. Okay. And then, if you go down to 11 V-E-R-S-I-E-L-T-E-R, Draht, D-R-A-H-T, do you 12 see that? 13 A. I do not. If you're referring to 14 two entries below, it says, verseilt, 15 V-E-R-S-E-I-L-T. Is that what you're referring 16 to? 17 Q. Yes. And then, I believe there's a 18 dash, D-R-A-H-T. Do you see that? 19 A. There's a dash, E-R, capital 20 D-R-A-H-T. Yes, I see that. 21 Q. Okay, and what is the definition? 22 A. After the word, Draht, it says

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229 1 twisted wire. 2 Q. Okay. Do you have any reason to 3 doubt the reliability of this book you're 4 reading from? 5 MR. HOEHNER: Objection to form. 6 No foundation. 7 A. That -- the -- the book contains a 8 set of proposed translations, which would need 9 to be taken in context by an individual, an 10 expert with consummate knowledge of technical 11 German as well as technical English to be able 12 to answer the question as to the reliability of 13 this reference in the context of translating a 14 document such as the 886 patent. 15 THE COURT REPORTER: You said, 886 16 patent? 17 A. Yes. Excuse me, it should be 866 18 patent. 19 Q. If you could, go to Exhibit 10 -- 20 1067 and go to page 464. 21 A. Yes. 22 Q. And there's an entry for the word	231 1 the particular document such as the 866 patent, 2 which would need to be translated by an expert 3 with a high degree of expertise in both 4 technical German as well as technical English. 5 Q. Are you aware that Belden, the 6 company, took the position in a prior 7 proceeding that the 866 patent disclosed 8 twisted pairs? 9 THE COURT REPORTER: Twisted? 10 Q. Pairs. 11 A. I am aware of a prior proceeding. 12 I am not aware -- I can't recall, as I sit 13 here, the specifics of that proceeding or any 14 of the positions that were taken. 15 Q. Okay. Did you know prior to 16 submitting your declarations in this proceeding 17 that Belden had previously taken the position 18 that the German 866 reference disclosed twisted 19 pairs? 20 A. I do not recall what my specific 21 knowledge was at the time that I filed the 22 declarations, but I relied upon the certified
230 1 litzendraht, L-I-T-Z-E-N-D-R-A-H-T. Do you see 2 that? 3 A. Could you say that again, please? 4 Q. Litzendraht, L-I-T-Z-E-N-D-R-A-H-T. 5 A. I see a word which I would read in 6 German as litzendraht, L-I-T-Z-E-N-D-R-A-H-T. 7 Q. Okay. And what is the definition? 8 A. The definition given here is 9 braided wire, comma -- 10 THE COURT REPORTER: I'm sorry? 11 A. Braided wire, stranded conductor as 12 the first definition. There's a second 13 definition as healed wire. 14 Q. Okay. Again, do you have any 15 reason to doubt the reliability of the book 16 that you are looking at? 17 MR. HOEHNER: Objection to form. 18 No foundation. 19 A. I have no basis to comment on the 20 reliability of the book which would need to be 21 taken in the context of the application of 22 these proposed translations in the context of	232 1 translation, which I believe is Exhibit 1010 2 with the attached declaration of a translator. 3 Q. You offered opinions in the 030 4 patent IPR proceeding, correct? 5 A. Yes, I did. 6 Q. Okay. And in that proceeding, you 7 opined on a claim that required twisted pairs, 8 correct? 9 A. I -- I may -- I believe there were 10 claims involved in that proceeding, but I'm not 11 sure which -- what you're talking about. 12 Q. So I'll give you a copy of the 030 13 patent that was marked as 1001 in the other 14 proceeding. I think it's sufficient for the 15 record just to refer to it as Exhibit 1001 from 16 the 030 patent proceeding. 17 MR. HOEHNER: If you plan on using 18 it, I think it needs to be an exhibit in 19 this proceeding. 20 THE COURT REPORTER: I'm sorry, if 21 you plan on? 22 MR. HOEHNER: Using it, it needs to

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233 1 be an exhibit in this proceeding. 2 Although, I think it's completely 3 irrelevant. 4 A. In any case, I'm -- whatever you 5 decide with respect to exhibits, I am aware of 6 the 030 patent. 7 Q. Okay. And if you go to claim one 8 of the 030, you would agree that it requires 9 twisted pairs, correct? 10 A. Well, the claim one of the 030 has 11 a first element reciting a first twisted pair 12 of insulated conductors, and the second element 13 is a second twisted pair of insulated 14 conductors. 15 THE COURT REPORTER: And the second 16 element is a second -- 17 A. Second twisted pair of insulated 18 conductors. 19 Q. And the -- the Roberts reference 20 that we were talking about earlier in this 21 proceeding, Exhibit 1009, that was also at 22 issue in the 030 proceeding, correct?	235 1 to Roberts in the 030 proceeding. 2 Q. Is it possible that in that 3 proceeding you were not asked to analyze 4 whether Roberts disclosed twisted pairs? 5 A. Again, I would need to review the 6 declarations in that proceeding to be able to 7 answer that question. 8 Q. Okay. Well, I can give you that 9 declaration. So I believe at paragraph 75, you 10 are talking about claim one of the 030 in the 11 context of Roberts? 12 A. That appears to be the case. 13 Q. Okay. And then, you note at 14 paragraph 75 that claim one of 030 patent 15 requires first and second twisted pairs of 16 insulated conductors. Do you see that? 17 A. I'm sorry, would you repeat that, 18 please? 19 Q. You note at paragraph 75 -- 20 A. Yes. 21 Q. -- that claim one of 030 requires 22 first and second twisted pairs of insulated
234 1 A. I -- I believe so, but I don't 2 recall the specifics as I sit here. 3 Q. Okay. And I will represent to you 4 that in that proceeding, your declarations did 5 not dispute that Roberts disclosed twisted 6 pairs as recited in claim one of the 030 7 patent. So -- 8 A. I can't agree to that. I would 9 need to review those declarations, but I can't 10 agree to that statement. 11 Q. Okay. My question to you is: Do 12 you recall any reason why you did not dispute 13 that Roberts disclosed twisted pairs in the 14 context of the 030 proceeding? 15 A. I -- I would need to review those 16 declarations to answer that question. 17 Q. Okay. But sitting here today, you 18 can't recall any specific reason? 19 A. In the absence of those 20 declarations, I cannot answer that question as 21 to what the analysis of Roberts -- what my 22 conclusions were and opinions were with respect	236 1 conductors? 2 A. Well, claim -- paragraph 75 says, 3 independent claims one and 18 of the 030 patent 4 require a multilayer barrier tape -- 5 THE COURT REPORTER: A multilayer? 6 A. Layer barrier tape 110 that 7 includes a conductive material 302 contained 8 between two layers of a dielectric material 9 300, 304 where the conductive material extends 10 to each lateral edge 306A, 306B of the two 11 layers of the dielectric material, and the 12 barrier tape surrounds the first 102A and 13 second 102B twisted pairs of insulated 14 conductors in the filler. 15 Q. Okay. So my question is -- 16 MR. HOEHNER: Counsel, I think just 17 for the record that we're over seven 18 hours at this point, so -- 19 MR. KOHLHEPP: Okay. I'd 20 appreciate it if he could answer my 21 question. He's taken a lot of time 22 today, so I think it's fair.

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237 1 MR. HOEHNER: You've taken seven 2 hours of his time, so -- 3 MR. KOHLHEPP: Which we are 4 entitled to. 5 MR. HOEHNER: We've completed that 6 so finish your questioning. 7 Q. So my question, Dr. Eldering, is: 8 Is there a particular reason you did not 9 dispute that Roberts discloses a first and 10 second twisted pair as recited by claim one of 11 the 030 patent? 12 THE COURT REPORTER: I'm sorry, 13 recited in claim? 14 Q. At -- by claim one of the 030 15 patent. 16 A. Well, this report -- and you've 17 picked -- you've picked one sentence -- or 18 excuse me, one paragraph in the report, but the 19 report addresses arguments raised by the 20 petitioner. And as such, the report, in 21 particular this paragraph, addresses arguments 22 and isn't made in response to arguments made by	239 1 questions. 2 MR. HOEHNER: No questions. 3 THE VIDEOGRAPHER: This marks the 4 end of the deposition of Charles 5 Eldering, Phd. We are going off the 6 record at 5:57 p.m. 7 THE COURT REPORTER: Would you like 8 a copy of the transcript? 9 MR. HOEHNER: Yes. 10 11 (Whereupon, at 5:57 p.m., the 12 examination of this witness was 13 concluded.) 14 15 16 _____ 17 CHARLES ELDERING, PH.D. 18 19 Subscribed and sworn to before me 20 this ____ day of _____, 2024. 21 22 _____ 23 NOTARY PUBLIC
238 1 the petitioner. 2 Q. So I guess I'm just trying to 3 understand in all three proceedings, the 030 4 patent, the 095, and the 537, Roberts is 5 involved, and the claims required first and 6 second twisted pairs. But in the 030 patent 7 proceeding, you did not offer an opinion that 8 Roberts does not disclose twisted pairs, and 9 I'm just wondering if there was a particular 10 reason for that choice? 11 A. Well -- 12 MR. HOEHNER: Objection to form. 13 A. -- as I have explained, this 14 declaration was developed with respect to 15 arguments raised by the petitioner and was, 16 therefore, focused on particular arguments and 17 in response to those arguments. Whether or not 18 other arguments could have been made is 19 speculative, and they certainly could have been 20 made. But it was not my responsibility to do 21 so. 22 MR. KOHLHEPP: Okay. No further	240 1 EXAMINATIONS 2 MR. KOHLHEPP 4 20 3 4 E X H I B I T S 5 PETITIONER'S PAGE LINE 6 EXHIBIT 1068 BOOK 222 5 7 EXHIBIT 1067 BOOK 223 9 8 EXHIBIT 1069 DOCUMENT 224 13 9 10 --- 11 12 13 14 15 16 17 18 19 20 21 22

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1 CERTIFICATE		1 STATE OF NEW YORK)	
2		ss.:	
3 STATE OF NEW YORK)		2 COUNTY OF BRONX)	
ss.:		3	
4 COUNTY OF BRONX)		4 I wish to make the following changes, for	
5		5 the following reasons:	
6		6	
7 I, DORENE GLOVER, a Notary Public for		7 PAGE LINE	
8 and within the State of New York, do hereby		8 ____ CHANGE:	
9 certify:		9 _____	
10 That the witness whose examination is		10 REASON:	
11 hereinbefore set forth was duly sworn and that		11 _____	
12 such examination is a true record of the		12 ____ CHANGE:	
13 testimony given by that witness.		13 _____	
14 I further certify that I am not related		14 REASON:	
15 to any of the parties to this action by blood		15 _____	
16 or by marriage and that I am in no way		16 ____ CHANGE:	
17 interested in the outcome of this matter.		17 _____	
18 I further certify that the adverse party		18 REASON:	
19 by counsel at the deposition.		19 _____	
20 I further certify that the deposition of		20 ____ CHANGE:	
21 Charles Eldering, Ph.D., occurred at the offices		21 _____	
22 of Barclay Damon, LLP, 125 East Jefferson Street,		22 REASON:	
	242		
1 Barclay Damon Tower, Syracuse, New York 13202,			
2 on Friday, June 21st, 2024, commencing at			
3 9:04 a.m to 5:57 p.m.			
4 IN WITNESS WHEREOF, I have hereunto set			
5 my hand this 23rd day of June, 2024.			
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8 			
9 DORENE GLOVER			
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