

Exhibit A-1

**Invalidity of U.S. Patent No. 10,877,233 (the “’233 Patent”) in View of
U.S. Patent No. 10,148,414 to Lughart *et al.***

U.S. Patent No. 10,148,414 to Lughart *et al.* (Lughart ’414) was filed on June 30, 2017, was published October 19, 2017, and claims domestic priority to at least U.S. Patent Application No. 14,581,979 filed on December 23, 2014. Lughart ’414 qualifies as prior art under 35 U.S.C. § 102(a)(1) (AIA) and 35 U.S.C. § 102(a)(2) (AIA)

The Administrative Law Judge has not yet construed the claims and therefore the meaning of the terms in the claims has yet to be resolved. The support identified here for limitations of the Asserted Claims of the ’233 Patent is responsive to Complainant’s apparent infringement contentions in its Complaint, which Respondents disagree with. As such, nothing in Respondents’ claim charts should be construed as an admission regarding infringement, either literally or under the doctrine of equivalents, or as an admission regarding Respondents’ understanding of the proper scope of the Asserted Claims of the ’233 Patent.

All cross-references should be understood to include material that is cross-referenced within the cross-reference. Where a particular Figure is cited, the citation should be understood to encompass the caption and description of the Figure as well as any text relating to or describing the Figure. Conversely, where particular text referring to a Figure is cited, the citation should be understood to include the Figure as well. Respondents reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Complainant’s infringement and/or domestic industry contentions, and/or information obtained during discovery as the Investigation progresses.

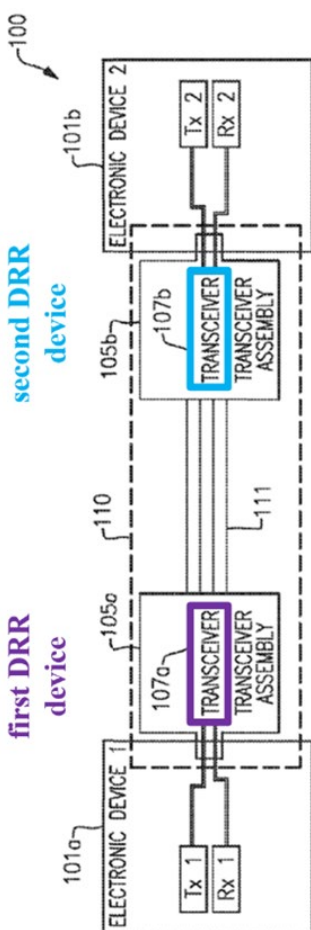
To the extent Complainant alleges that Lughart ’414 does not disclose any particular limitation of the Asserted Claims of the ’233 Patent, either expressly or inherently, it would have been obvious to a person of ordinary skill in the art as of the priority date of the ’233 Patent to modify Lughart ’414 and/or to combine the teachings of Lughart ’414 with other prior art references, including but not limited to the prior art references cited in the Cover Pleading and the relevant section(s) of claim charts for other prior art references for the ’233 Patent in a manner that would have rendered the Asserted Claims invalid as obvious.

Because Complainant has yet to identify any limitation of the Asserted Claims of the ’233 Patent that it contends is not fully disclosed by Lughart ’414, either alone or in combination with other prior art cited by Respondents, Respondents expressly reserve the right to rebut any such contention, including by identifying additional obviousness combinations, if any such contention is made by Complainant. Respondents further reserve the right to amend or supplement this claim chart at a later date as more fully set forth in the Cover Pleading.

Exhibit A-1

A. INDEPENDENT CLAIM 1

Claim 1	Lugthart '414
<p>1[pre] A cable that comprises:</p>	<p>To the extent the preamble is limiting, Lugthart '414 discloses and/or renders obvious this limitation. Lugthart '414 discloses the subject matter of the preamble of claim 1 because Lugthart '414 discloses “an electrical cable including one or more pairs of differential micro coaxial cables or conductors” to implement a “high-speed communication link between first and second electronic devices.” See, e.g., Lugthart '414 at 7:1-23, 14:10-34, 15:47-57, Fig. 2A (cable 110).</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>1[a] a first data recovery and remodulation (DRR) device that exchanges inbound and outbound multi-lane data streams with a first host interface port via a first end connector plug;</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>DRR Devices</p> <p>The '233 Patent defines “a data recovery and re-modulation (DRR) device” as “a powered transceiver that performs clock and data recovery (CDR) and re-modulation of data streams.” See '233 Patent at 3:51-55. The transceivers of Lugthart '414 have these characteristics and are DRR devices.</p> <p>Lugthart '414 discloses a first DRR device and a second DRR device because its active cable includes “a pair of transceivers provided at respective ends of the cable.” See Lugthart '414 at 7:1-3, Figs. 1A (transceiver 10), 1B-1C, 2A (annotated below showing transceivers 107a/107b), 8:12-64 (describing transceiver 10). These transceivers are powered. See <i>id.</i> at 14:10-56 (“cable 110 ... includ[es] actively powered componentry for improving performance of the cable 110”).</p>

<p>Claim 1</p>	<p style="text-align: center;">Lugthart '414</p>  <p>The diagram, labeled FIG. 2A, shows a system 100. It consists of two electronic devices, 101a and 101b. Electronic device 101a contains a transceiver assembly 107a, and electronic device 101b contains a transceiver assembly 107b. The two transceiver assemblies are connected to each other via a set of lines 111. Each transceiver assembly is also connected to its respective electronic device via lines 105a and 105b. The entire system is enclosed in a dashed box 110.</p>
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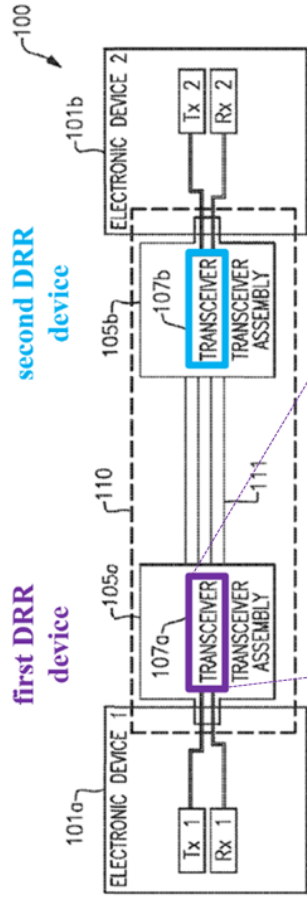


FIG. 2A

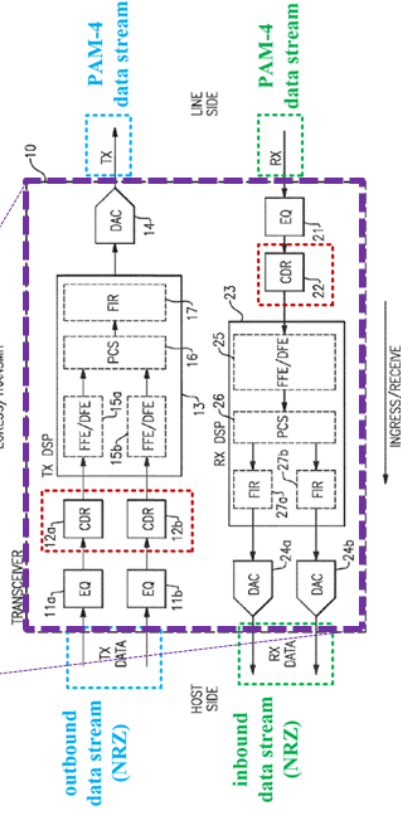


FIG. 1A

The transceiver 10 is an embodiment of transceivers 107a/107b of Lugthart '414. See, e.g., Lugthart '414 at 8:12-16, Fig. 1A (annotated above). The CDR 12a/12b and 22 "perform clock and data recovery operations" on respective signals—"TX Data" (outbound data stream) from the host (CDR 12a/12b) and "RX" from the line (CDR 22). See *id.* at Lugthart '414 at 9:30-41, 33:5-10, Figs. 1A (above).

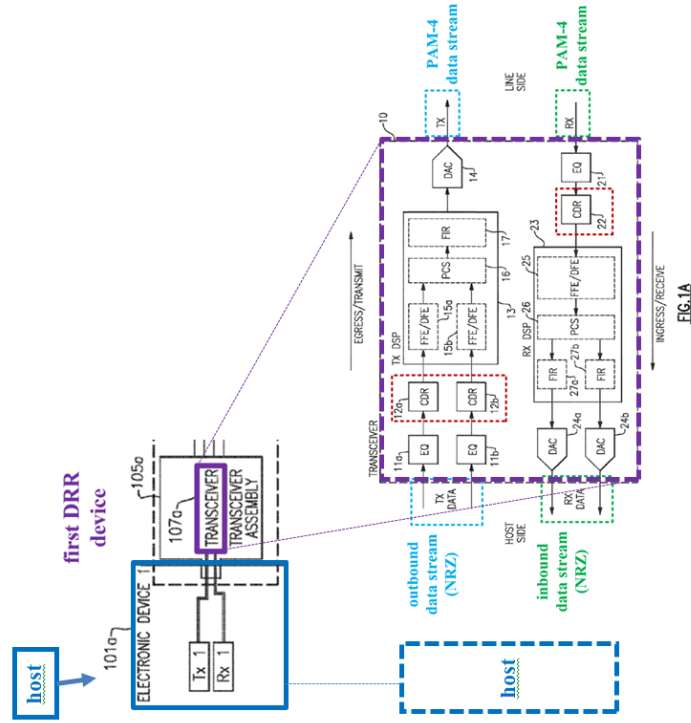
Lugthart '414

Claim 1

As explained below, transceiver 10 remodulates host-side non-return-to-zero (NRZ) "TX Data" (outbound data stream) to a four-level pulse amplitude modulation (PAM-4) "TX" data stream for transmission over the cable, and vice-versa. See, e.g., Lugthart '414 at 7:10-36, 8:44-64; 13:28-30. Transceivers 107a and 107b are the first and second DRR devices, respectively.

Inbound and Outbound Multi-Lane Data Streams

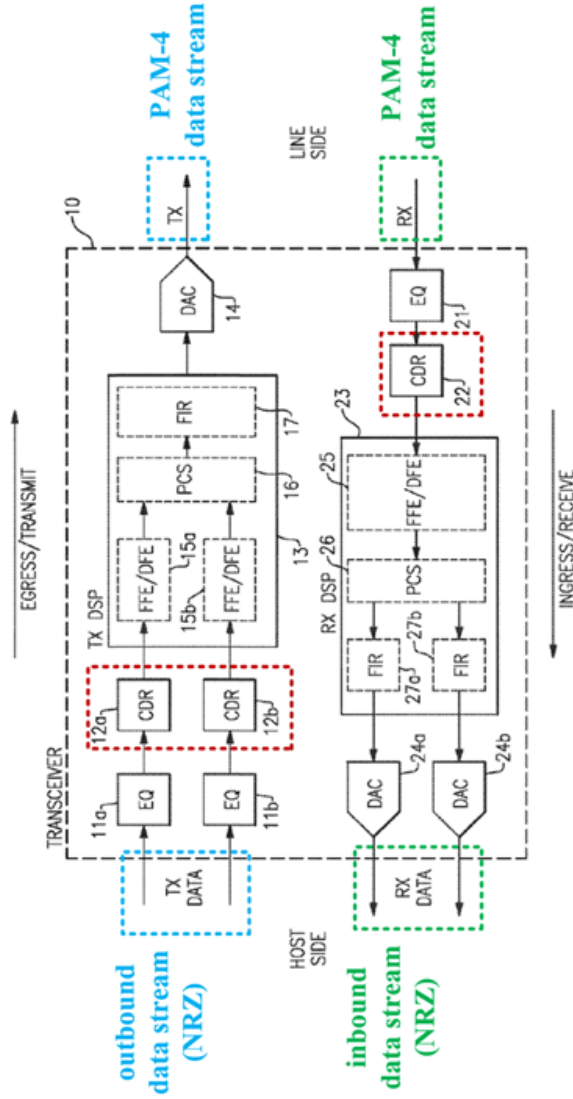
The '233 Patent defines inbound and outbound from a host's viewpoint, e.g., "inbound data streams to the host interface" and "outbound data streams from the host interface." See '233 Patent at 3:57-60, 4:47-52. Like the claims, Lugthart '414 defines data streams and communication paths from the host's perspective.



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Claim 1

The RX and TX DATA indicated on the host (left) side of Figure 1A are inbound and outbound data streams.



An ordinarily skilled artisan would have understood the multiple arrows for each data stream to represent multiple lanes. Lugthart '414 uses the term "lane" in a way that makes clear that the multiple arrows in Fig. 1A indicate multiple lanes. See, e.g., Lugthart '414 at 13:28-30 ("each of the transceivers described above as implementing a multiplexing function in the egress/transmit direction will be capable of performing a corresponding demultiplexing function in the ingress/receive direction to generate the appropriate number of host-side lanes."), Figs. 1A-1D, 13:16-51 (describing configurations with different numbers of lanes at the host-side and/or line-side).

Claim 1	Lugthart '414
	<p>This usage is consistent with the Ethernet standard in which a “lane” is a “bundle of signals” that “communicate a quantum of data and/or control information between two end-points.” <i>See, e.g., IEEE Std. 802.3-2015 (Section 1) at 86 (§ 1.4.246).</i></p> <p>This usage is also consistent with the '233 Patent specification, which describes “converting 1 lane of PAM4 symbols into 2 lanes of NRZ symbols, and vice versa,” as is depicted in FIG. 1A of Lugthart '414. <i>See, e.g., Lugthart '414 at 8:54-64.</i></p> <p>The '233 Patent specification also refers to a “unidirectional connection” and defines a “bidirectional lane” as “formed by two unidirectional connections” wherein one is for transmit (TX) and the other for receive (RX). <i>See, e.g., '233 Patent at Fig. 3A, 5:16-24 (bidirectional lanes LN0-LN3).</i> Accordingly, one of the arrows for the TX DATA and one for the RX DATA in Fig. 1A of Lugthart '414 represents a bidirectional lane as that term is used in the specification.</p> <p>The '233 Patent specification uses a multi-lane data stream to describe multiple lanes that each carry a portion of a data stream, which is also shown Figure 1A of Lugthart '414. <i>See, e.g., '233 Patent at 2:18-20 (describing “[a DRR] device... converts a multi-lane data stream from the first host interface port”).</i></p> <p>Lugthart '414 discloses inbound and outbound multi-lane data streams because its transceiver receives TX DATA (outbound data stream) from a host in multiple lanes on the “EGRESS/TRANSMIT” path. <i>See, e.g., Lugthart '414 at 7:27-30, 8:17-36, 13:28-30, Figs. 1A (TX data on two lanes), 1C-1D (showing multiple host-side differential TX lanes), Fig. 2A. Transceiver 10 transmits RX DATA (inbound data stream) to a host—on the “INGRESS/RECEIVE” path—in multiple lanes. See, e.g., id. at 7:27-30, 8:17-36, 13:28-30, Figs. 1A (RX DATA on two lanes), 1C-1D (showing multiple host-side differential RX lanes), Fig. 2A.</i></p> <p>End Connector Plug</p> <p>The “end connector plug” is capable of being inserted in a “host interface port.” <i>See claim limitation 15[a]; '233 Patent at 2:16-17.</i> The '233 specification describes a connector terminating an end of a cable as including a “plug” (e.g., end connector plug) adapted to mate with a host device's Ethernet port (e.g., host interface port). <i>See, e.g., id. at Fig. 2 (connector 100), Fig. 3B (connector 100/101, plug 200/201, host device 302/304), 4:47-54 (“Connector 100 includes a plug 200 adapted to fit a standard-compliant</i></p>

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Ethernet port in a first host device 302[.]], 7:14-15 (“The connectors 100, 101, have plugs 200, 201 that mate with the receptacles 336 of the two host devices 302, 304.”).

Lugthart '414 discloses a cable with transceiver assemblies 105a/105b at respective ends of cable 110. See, e.g., Lugthart '414 at [7:1-3], [15:47-57], Fig. 2A (annotated below). “Each of the transceiver assemblies 105a and 105b has an input port that is configured to mechanically and electrically connect, e.g., in a releasable fashion, to a corresponding port... on the respective electronic device 101a, 101b[.]” See *id.* at 15:47-57.

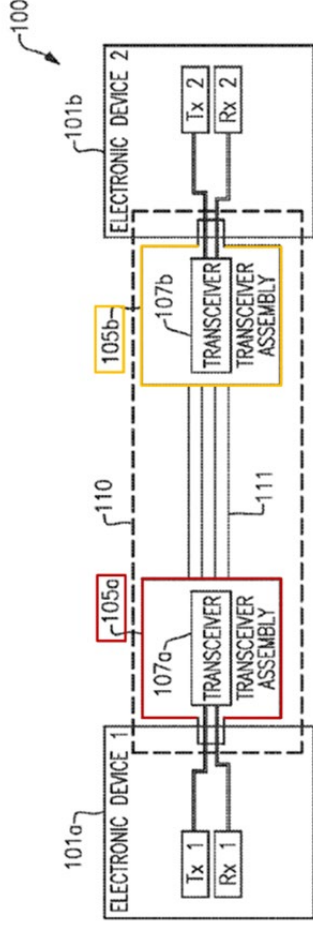


FIG. 2A

In Lugthart '414 the input port for each transceiver assembly 105a/105b is a first/second end connector plug, respectively, because it mechanically and electrically mates with the corresponding port on an electronic device (e.g., host device) just like plug 200 in the '233 Patent. An ordinarily skilled artisan also understood that the corresponding port in each electronic device was conventionally a “standard-complaint Ethernet port” ('233 Patent at 4:47-54) because the combination describes the input port as comprising standardized connectors including SFP and QSFP that were typically used for Ethernet-complaint connections and had plugs for mating with an electronic device’s interface port. See, e.g., Lugthart '414 at 15:47-57, 15:64-16:3; see *also* SFP-DD MSA, “SFP-DD Hardware Specification for SFP Double Density 2X Pluggable Transceiver,” SFP-DD Rev 3.0 (April 10, 2019) at 26-27; SFF-8436 Specification for QSFP+ 4X 10 Gb/s Pluggable Transceiver, Rev. 4.9 (Aug. 31, 2018) at 24.

Claim 1	Lugthart '414
	<p>Host Interface Port</p> <p>The '233 Patent describes “inserting [an] end connector plug of a cable into a... host interface port[.]” See, e.g., claim limitation 15[a], '233 Patent at 2:16-17.</p> <p>The “electronic device” of Lugthart '414 is a host device. See, e.g., Lugthart '414 at 14:15-18 (“first and second electronic devices 101a, 101b, which can also be referred to herein as host devices.”). The electronic device interface is a host interface. See <i>id.</i> at 3:33-36 (“a communication device includes a host interface”). The transceiver assembly 107a/107b input port “mechanically and electrically connect[s], e.g., in a releasable fashion, to a corresponding port... on the respective electronic device 101a, 101b[.]” See <i>id.</i> at 15:47-57. The “corresponding port” on electronic device 101a/101b is the first/second host interface port, respectively, because it receives and electrically and mechanically connects the transceiver assembly 107a/107b input port (e.g., first/second end connector plug).</p> <p>When the transceiver 107a of Lugthart '414 exchanges inbound and outbound multi-lane data streams with a first host interface port via a first end connector plug because as explained above, e.g., Figure 1A, when connected to a host device the transceiver electrically receives two lanes of TX data (outbound multi-lane data stream) from, and transmits two lanes of RX data (inbound multi-lane data stream) to, electronic device 101a (host device) through the “corresponding port” (first host interface port) that electrically connects the transceiver assembly 107a’s input port (first end connector plug). See Lugthart '414 at 8:12-36 (transceiver “receive[s] host side transmit data,” DAC 24a/24b “generate host side receive data”), 8:37-43 (“transceiver 10 can be used to support data transfer between various electronic devices”). Transceiver 107b in transceiver assembly 105b provides the same functionality with electronic device 101b.</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

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Claim 1	Lugthart '414
<p>1 b] a second DRR device that exchanges inbound and outbound multi-lane data streams with a second host interface port via a second end connector plug; and</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 1 b] for the same reasons that Lugthart '414 discloses the subject matter of claim limitation 1 a]. See, e.g., claim limitation 1 a].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>1 c] electrical conductors connecting the first and second DRR devices to convey electrical transit signals therebetween,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 1 c] because the combination a cable 110 comprising conductive lines 111 (electrical conductors) connecting transceivers 107a/107b. See, e.g., Lugthart '414 at 14:32-45, 16:17-27 (copper conducting lines 111); 19:9-13 (lines 111 can be twinaxial cable providing differential signaling), Fig. 2A (annotated below).</p>

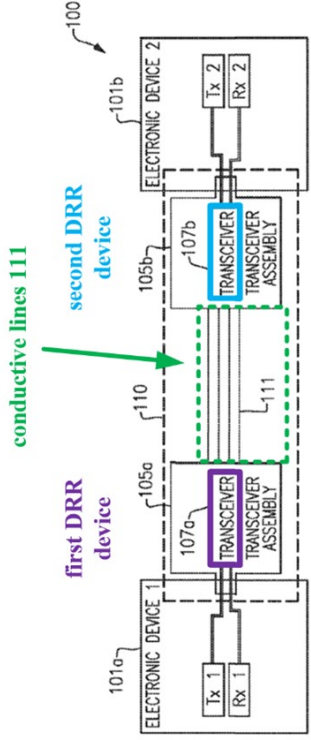


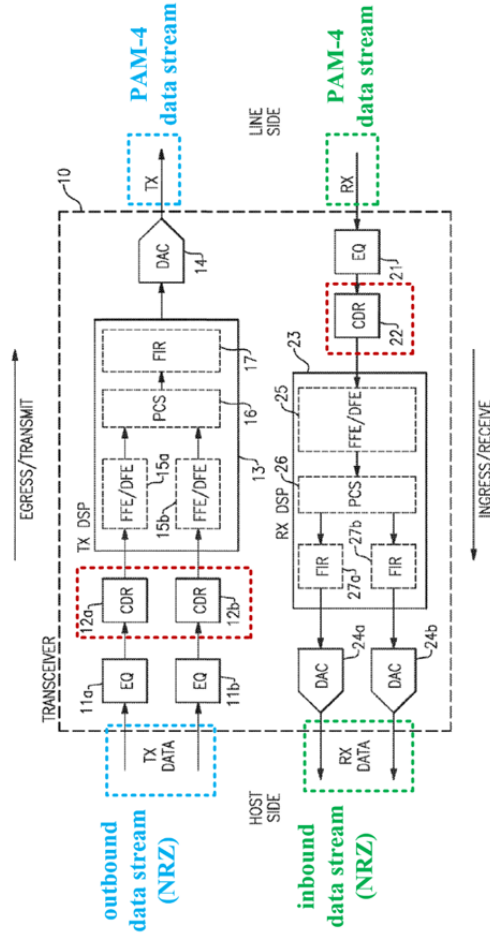
FIG. 2A

Claim 1	Lugthart '414
<p>1[d] the first DRR device converting between said electrical transit signals and said inbound and outbound multi-lane data streams for the first host interface port, and</p>	<p>The '233 Patent describes electrical signals “transiting the cable conductors” as “electrical transit signals.” See '233 Patent at 2:5-7, 4:17-18. The conducting lines 111 of Lugthart '414 conduct electrical signals between transceivers 107a and 107b. See, e.g., Lugthart '414 at 14:10-45, 16:17-22 (“electrical conducting lines 111... can transport electrical signals” between electronic devices 101a/b), 19:9-13 (twinax lines 111 support differential signaling).</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>1[d] the first DRR device converting between said electrical transit signals and said inbound and outbound multi-lane data streams for the first host interface port, and</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>As explained for claim limitation 1[a], Lugthart '414 converts multiple NRZ data streams from a host to, e.g., re-timed NRZ or PAM-4 data stream(s) over the cable, and the reverse for RX signal from the cable to RX DATA transmitted to the host device. See, e.g., Lugthart '414 at 8:44-64, 13:16-51. This matches an example of converting in the specification. See, e.g., '233 Patent at 4:44-45.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 1[d] because the combination's transceiver 107a receives multiple signals from a host device comprising “host side transmit data (TX DATA)” e.g., outbound multi-lane data streams. See, e.g., Lugthart '414 at 8:17-21, 30:25-27, Figs. 1A (annotated below), 6A; see also claim limitation 1[a].</p> <p>Transceiver 107a “converts between” the TX DATA from the first host (electronic device 101a)—received over the first host interface port (see claim limitation 1[a])—and the TX signal (e.g., electrical transit signal, (see claim limitation 1[c]) transmitted over the cable by equalizing the TX DATA signal received (equalizers 11a/11b), performing a CDR function (CDR 12a/12b), conditioning and recovering the TX DATA (DSP 13), and multiplexing and remodulating the TX DATA into the TX signal (DSP 13,</p>

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Claim 1

DAC 14). See, e.g., Lugthart '414 at 8:23-26, 9:56-59, 16:18-22, 30:27-57, see generally [8:3-10:31] (describing transceiver), Figs. 1A (annotated below), 2A, 6A.



The receive path electronics perform the same operations—in a reverse order—to convert between the RX signal from the cable to the RX DATA signal transmitted to the host device. The transceiver signal conversion is for the first host interface port because as explained above transceiver 107a receives TX DATA from, and transmits RX DATA to, electronic device 101a via the first host interface port. See, e.g., Lugthart '414 at 9:14-55, see generally 8:3-10:31 (describing transceiver), Figs. 1A (“INGRESS/RECEIVE”), 2A, 6A.

The transceiver 107b of Lugthart '414 provides the same functionality for electronic device 101b. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or

Claim 1	Lugthart '414
<p>1[e] the second DRR device converting between said electrical transit signals and said inbound and outbound multi-lane data streams for the second host interface port,</p>	<p>from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p> <p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 1[e] for the same reasons that Lugthart '414 discloses the subject matter of claim limitation 1[d]. <i>See, e.g.</i>, claim limitation 1[d].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>1[f] the first and second DRR devices providing pre-equalization of the electrical transit signals using transmit filter coefficient values stored in non-volatile memories.</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Pre-Equalization</p> <p>Lugthart '414 discloses the subject matter of claim limitation 1[f] because the transceivers 107a/b of the combination provide “adaptive and configurable signal conditioning features such as... output pre-emphasis” on the TX signals transported by conductive lines 111 (e.g., electrical transit signals). <i>See, e.g.</i>, Lugthart '414 at 16:17-22, 23:64-24:7, 29:25-30, Figs. 1A, 2A. An ordinarily skilled artisan understood that “pre-emphasis” and “pre-equalization” have the same meaning. <i>See, e.g.</i>, U.S. Patent No. 8,787,430 at 2:39-41 (describing a “technique for combating ISI... known as ‘pre-emphasis’, or pre-equalization”); <i>see also</i> U.S. Patent No. 9,806,812 at 7:54-55; U.S. Patent No. 9,137,063 at 3:24-27; 9,152,257 at 5:4-8.</p> <p>Transceivers 107a/107b provide pre-equalization in DSP 13 using finite impulse response (FIR) filter 17. FIR filter 17 is a transmit filter because DAC 14 converts the FIR 17 output to an analog signal that is transmitted on the line side. <i>See, e.g.</i>, Lugthart '414 at 23:19-23, 23:64-24:7, Fig. 1A (annotated detail below).</p>

<p>Claim 1</p>	<p style="text-align: center;">Lugthart '414</p> <p>The diagram illustrates a transmitter system (10) divided into a HOST SIDE and a LINE SIDE. On the HOST SIDE, TX DATA is processed by two parallel paths: 11a and 11b. Path 11a includes an EQ block (11a1) and a CDR block (12a1). Path 11b includes an EQ block (11b1) and a CDR block (12b1). The outputs of these paths are combined and processed by two parallel FFE/DFE blocks (15a and 15b). The outputs of these blocks are then processed by a PCS block (16) and an FIR block (17). The output of the FIR block is processed by a DAC block (14) and then a TX block (10) to produce a PAM-4 data stream on the LINE SIDE. The entire system is labeled as EGRESS/TRANSMIT.</p> <p>The FIR filter 17 “perform[s] emphasis on the signal to compensate for channel losses,” e.g., it pre-equaliz[es] the electrical transit signal. See Lugthart '414 at 23:67-24:2. The FIR filter 17 forwards conditioned signals to DAC 14 for transmission over cable 110 and conductive lines 111. See, e.g., <i>id.</i> at 8:23-26, 16:17-22, 23:64-24:7, Figs. 1A, 2A. The TX signals transmitted on the cable’s conductive lines are electrical transit signals.</p> <p>The FIR filter 17 tap coefficients are transmit filter coefficient values. The '233 Patent states that “equalization parameters may include filter coefficient values for pre-equalizer filters[.]” See '233 Patent at 5:45-48, 8:19-30 (during training adaptation adjusts filter coefficient values). Lugthart '414 explains that FIR filter 17 can be “a five tap FIR filter with tap coefficients S5.3, S7.3, S8.3, S7.3, S5.3” (see Lugthart '414 at 22:19-23).</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
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B. DEPENDENT CLAIM 2

Claim 2	Lugthart '414
<p>2 a The cable of claim 1, further comprising a first controller that configures the first DRR device in response to a power-on event,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>2 b the first controller retrieving the transmit filter coefficient values from the non-volatile memories as part of said configuring.</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

C. DEPENDENT CLAIM 3

Claim 3	Lugthart '414
<p>3. The cable of claim 1, wherein the first and second DRR devices are programmed to use the transmit coefficient values each time power is supplied to the first and second end connector plugs.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. For the limited purpose of this analysis, the phrase “transmit coefficient values” is interpreted as referring to “transmit filter coefficient values,” (<i>see, e.g.,</i> claim limitation 1[f]) as the term otherwise has no antecedent basis.</p> <p>An ordinarily skilled artisan would have found such an implementation of Lugthart '414 obvious, as Lugthart '414 already discloses programmable circuitry. <i>See, e.g.,</i> Lugthart '414 at 30:44-46 (“Programmable chip sets, physical coding sublayer (PCS) blocks, FPGAs, FIR filters can be used to condition and multiplex the digital data signal.”). As the first and second DRR devices include the transceivers, an ordinarily skilled artisan would have understood that Lugthart '414 discloses “the first and second DRR devices are programmed.”</p> <p>Power-up indicates that power is supplied to the first and second end connector plugs. An ordinarily skilled artisan would have understood that power is supplied from a host device when the enclosing connector’s connector plug was electrically connected to the host interface port in a corresponding electronic device 101a/b as described claim limitation 1[a] because this was conventionally how standardized connectors like QSFP or SFP worked. <i>See, e.g.,</i> Lugthart '414 at 15:41-57 (describing connector formats); <i>see also</i> SFF-8436 at 21 (“A host board together with the QSFP+ module(s) forms an integrated power system. The host supplies stable power to the module.”), 22 Fig. 4 (“Recommended Host Board Power Supply Filtering”). Regardless, an ordinarily skilled artisan would have found it conventional and obvious to implement Lugthart '414 with QSFP connectors powered by a connected host device.</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

D. DEPENDENT CLAIM 4

<p>Claim 4</p>	<p>Lugthart '414</p>
<p>4. The cable of claim 3, wherein the transmit filter coefficient values are determined and stored in the non-volatile memories after assembly of the cable.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. EEPROM is electrically erasable programmable read only memory, e.g., rewritable NVM. An ordinarily skilled artisan would have known that flash memory was another well-known rewritable non-volatile memory (e.g., "EEPROM or the like") conventionally used with transmit FIR filters. <i>See, e.g., U.S. Patent No. 6,975,140 at 3:42-4:2</i> ("Any type of NVRAM can be used as the rewritable non-volatile storage, so long as [it] is of the type suitable for integration on an integrated circuit."). An ordinarily skilled artisan would have understood such memories would be used when the content of those memories is both re-programmed and preserved through startup/power-up, initialization or re-initialization.</p> <p>Thus, an ordinarily skilled artisan would have included rewritable non-volatile memory that could be updated with new coefficient values that fine-tuned pre-equalization or equalization with new coefficient values learned through training at manufacture or during usage with a particular device in a particular environment. <i>See, e.g., Lugthart '414 at 48:64-49:12, 49:20-37; see also U.S. Patent No. 6,975,140 at 3:42-4:2, 9:21-28.</i> Preserving such adapted pre-equalization filter coefficients in rewritable non-volatile memory like an EEPROM would have ensured that the fine-tuned coefficients remained available after an AEC transceiver—or the host powering it—was power cycled, initialized, or re-initialized.</p> <p>Regardless, an ordinarily skilled artisan would have known that storing updated filter coefficients in non-volatile memory was conventional and desirable so that the adapted coefficient values would be available after power cycling the active electric cable transceiver by unplugging it from a host device powering it, or power cycling the host device powering the active element cable transceiver. <i>See U.S. Patent No. 6,975,140 at Abstract</i> ("[D]ata transmitter includes a rewritable non-volatile storage, operable to be rewritten with control information representing the values of coefficients updated during operation off the FIR driver."), <i>2:46-49 (same), 3:45-52</i> ("Updated values of the coefficients used in the taps of the FIR transmitter 30 are determined and stored to the flash memory 20 during the operation of the FIR transmitter. When the FIR transmitter is powered off and back on again, the coefficient values as last updated are available to be retrieved from the flash memory 20 and applied to the taps of the FIR transmitter again.").</p>

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Claim 4	Lugthart '414
	<p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

E. DEPENDENT CLAIM 5

<p>Claim 5</p>	<p>Lugthart '414</p>
<p>5. The cable of claim 4, wherein the first and second DRR devices employ receiver-based equalization of the electrical transit signals using coefficient values stored in the non-volatile memories.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>The '233 Patent specification repeats the “receiver-based equalization” language of dependent claim 5, but fails to provide any explanation of what the phrase means. <i>See, e.g.</i>, '233 Patent at 2:42-45, 2:61-63. Nevertheless, “receiver-based equalization” is met by equalizing a received signal to compensate for distortion incurred during transmission. <i>See, e.g.</i>, U.S. Patent No. 9,178,542 at 10:22-35; U.S. Patent App. Pub. No. 2005/0078758 at [0004]; U.S. Patent No. 7,570,708 at 2:17-21; Pavan Kumar Hanumolu, <i>et al.</i>, “Equalizers for High-Speed Serial Links,” International Journal of High Speed Electronics and Systems, vol. 15, no. 2, 2005 (“Hanumolu”) at p.185 (describing “receive-side equalization” suppressing channel loss).</p> <p>The transceivers equalize signals received over conductive lines 111 (e.g., electrical transit signals) using receive path equalizer 21 to improve signal fidelity. <i>See</i> Lugthart '414 at 9:14-29 (“receive path equalizer 21 can be used to provide signal equalization to compensate for transmission line losses on the line side” such as “to compensate for high-frequency signal loss by boosting high frequency components of a signal relative to low frequency components of the signal, thereby improving signal fidelity.”). As part of the transceivers, receive path equalizers 21 in transceivers 107a and 107b would be in the first and second DRR devices, respectively. <i>See, e.g.</i>, claim limitations 1[a], 1[b].</p> <p>Receive path equalizers 21 are performing an equalization function analogous to that performed by transmit filters 17. It would have been obvious to implement transmit filters 17 in Lugthart '414 using coefficient values stored in non-volatile memories, and it would have been obvious to implement equalizers 21 with coefficient values stored in the nonvolatile memories.</p> <p>Lugthart '414 suggests that equalizers 21 are, like filters 17, configured to compensate for signal distortion over the cable. <i>See</i> Lugthart '414 at 22:49-54 (“The equalizer 21 can be configured to compensate for losses occurring during transmission over the cable....”).</p> <p>The equalization functionality of equalizer 21 depends on filter coefficient settings like transmit filter 17. <i>See, e.g.</i>, Hanumolu at pp. 185-198 (describing different receive-side equalization architectures</p>

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Claim 5	Lugthart '414
	<p>configured with coefficients [C-1, C0, C1]); U.S. Patent App. Pub. No. 2014/0281068 at [0069] (describing applying coefficients to a receiver's settings to minimize communication data loss).</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

F. DEPENDENT CLAIM 6

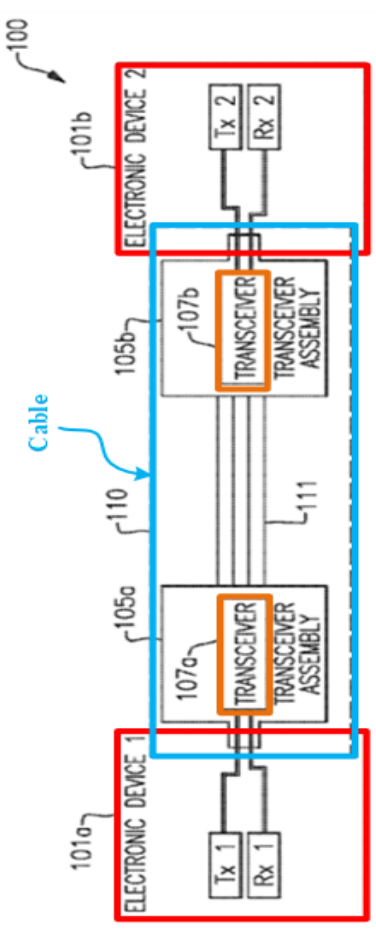
Claim 6	Lugthart '414
<p>6. The cable of claim 4, wherein the electrical conductors comprise twin-axial conductors that carry each of the electrical transit signals in differential form.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>The active cable of Lugthart '414 includes at least one twin-axial cable, which includes at least two inner conductors that provide differential signaling. See Lugthart '414 at 19:9-13 (“a cable can include twinaxial cables (‘Twinax’), where each Twinax cable includes two inner conductors... [and] the two inner conductors can be configured to implement differential signaling.’). The twin-axial cable’s inner conductors are twin-axial conductors. See U.S. Patent No. 9,172,578 at 3:41-45 (“twinaxial (or ‘twinax’) cables... can each comprise a full-duplex twinax pair of conductors”). The Twinax conductors transport signals (e.g., electrical transit signals) between the ends of the cable.</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

G. DEPENDENT CLAIM 7

<p>Claim 7</p>	<p>Lugthart '414</p>
<p>7. The cable of claim 1, wherein the first and second DRR devices do not perform pre-equalization of the multi-lane data streams provided to the first and second host interface ports.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

H. INDEPENDENT CLAIM 8

Claim 8	Lugthart '414
<p>8[pre] A cable manufacturing method that comprises:</p>	<p>To the extent the preamble is limiting, Lugthart '414 discloses and/or renders obvious this limitation. An ordinarily skilled artisan would have found it obvious to manufacture the cable disclosed in claim 1 cable by “connecting” Lugthart '414 's transceiver, at each end of a cable, to standard connectors and conductive lines 111.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>8[a] connecting a first connector plug to a first data recovery and remodulation (DRR) device that exchanges multi-lane data streams with a first host interface port via the first connector plug;</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Claim limitation 8[a] recites connecting a first connector plug to the first DRR device recited in claim limitation 1[a]. An ordinarily skilled artisan would have had reasons to “connect” a “connector plug” to the transceiver 107a (first DRR device) of Lugthart '414 since Lugthart '414 discloses each transceiver having “an input port” comprising the connector plug. <i>See, e.g.,</i> claim limitation 1[a]. An ordinarily skilled artisan would have understood that the input port required electrical connection to a transceiver before it could transport signals between a host transceiver and transceiver 107a to provide the functionality. <i>See, e.g.,</i> Lugthart '414 at Fig. 2A (below); <i>see also</i> claim limitation 1[a].</p>

Claim 8	Lugthart '414
	 <p style="text-align: center;">FIG. 2A</p>
<p>8[b] connecting a second connector plug to a second DRR device that exchanges multi-lane data streams with a second host interface port via the second connector plug;</p>	<p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p> <p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Claim limitation 8[b] recites connecting a second connector plug to the second DRR device recited in claim limitation 1 [b]. An ordinarily skilled artisan would have had reasons to “connect” a “connector plug” to the transceiver 107b (second DRR device) of Lugthart '414 since Lugthart '414 discloses each transceiver having “an input port” comprising the connector plug. <i>See, e.g.</i>, claim 1 limitation 1[b]. An ordinarily skilled artisan would have understood that the input port required electrical connection to a transceiver before it could transport signals between a host transceiver and transceiver 107b to provide the functionality. <i>See, e.g.</i>, Lugthart '414 at Fig. 2A (below); <i>see also</i> claim 1 limitation 1[b].</p>

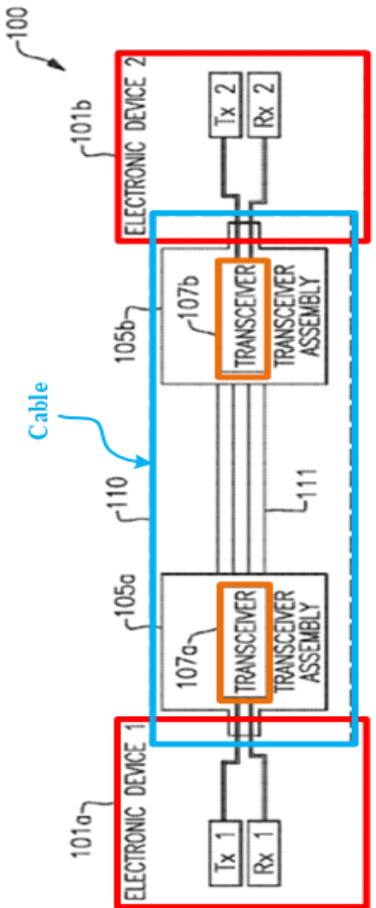
<p>Claim 8</p>	<p>Lugthart '414</p>
<p>8[c] connecting electrical conductors to the first and second DRR devices to convey electrical transit signals therebetween,</p>	 <p style="text-align: center;">FIG. 2A</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p> <p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>An ordinarily skilled artisan would have had reasons to “connect” conductive lines 111 to Lugthart '414 transceivers 107a/107b to achieve the cable wherein lines 111 electrically connect transceivers 107a/107b. See, e.g., Lugthart '414 at 16:17-22; see also claim limitation 1[c].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify</p>

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Claim 8	Lugthart '414
<p>8[d] the first DRR device converting between said electrical transit signals and said multi-lane data streams for the first host interface port, and</p>	<p>or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p> <p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>The multi-lane data streams recited in claim limitation 8[d] are the same as the inbound and outbound multi-lane data streams of claim limitation 1[d].</p> <p>Lugthart '414 discloses the subject matter of claim limitation 8[d] for the same reasons that Lugthart '414 discloses the subject matter of claim limitation 1[d]. <i>See, e.g.</i>, claim limitation 1[d].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>8[e] the second DRR device converting between said electrical transit signals and said multi-lane data streams for the second host interface port,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>The multi-lane data streams recited in claim limitation 8[e] are the same as the inbound and outbound multi-lane data streams of claim limitation 1[e].</p> <p>Lugthart '414 discloses the subject matter of claim limitation 8[e] for the same reasons that Lugthart '414n discloses the subject matter of claim limitation 1[e]. <i>See, e.g.</i>, claim limitation 1[e].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or</p>

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Lugthart '414	
Claim 8	<p>from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p> <p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 8[f] for the same reasons that Lugthart '414 discloses the subject matter of claim limitation 1[f]. See, e.g., claim limitation 1[f].</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

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I. DEPENDENT CLAIM 9

Claim 9	Lugthart '414
<p>9[a] The method of claim 8, further comprising: providing a first controller device that configures the first DRR device in response to a power-on event,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>9[b] the first controller device retrieving the transmit filter coefficient values from an internal non-volatile memory as part of said configuring.</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

J. DEPENDENT CLAIM 10

<p>Claim 10</p>	<p>Lugthart '414</p>
<p>10. The method of claim 8, further comprising: programming the first and second DRR devices to use the transmit coefficient values each time power is supplied to the first and second end connector plugs.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. For the limited purpose of this analysis, the phrase “transmit coefficient values” is interpreted as referring to “transmit filter coefficient values,” (<i>see, e.g.,</i> claim limitation 1[f]) as the term otherwise has no antecedent basis.</p> <p>An ordinarily skilled artisan would have found such an implementation of Lugthart '414 obvious, as Lugthart '414 already discloses programmable circuitry. <i>See, e.g.,</i> Lugthart '414 at 30:44-46 (“Programmable chip sets, physical coding sublayer (PCS) blocks, FPGAs, FIR filters can be used to condition and multiplex the digital data signal.”). As the first and second DRR devices include the transceivers, an ordinarily skilled artisan would have understood that Lugthart '414 discloses “the first and second DRR devices are programmed.”</p> <p>Power-up indicates that power is supplied to the first and second end connector plugs. An ordinarily skilled artisan would have understood that power is supplied from a host device when the enclosing connector's connector plug was electrically connected to the host interface port in a corresponding electronic device 101a/b as described claim limitation 1[a] because this was conventionally how standardized connectors like QSFP or SFP worked. <i>See, e.g.,</i> Lugthart '414 at 15:41-57 (describing connector formats); <i>see also</i> SFF-8436 at 21 (“A host board together with the QSFP+ module(s) forms an integrated power system. The host supplies stable power to the module.”), 22 Fig. 4 (“Recommended Host Board Power Supply Filtering”). Regardless, an ordinarily skilled artisan would have found it conventional and obvious to implement Lugthart '414 with QSFP connectors powered by a connected host device.</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

K. DEPENDENT CLAIM 11

Claim 11	Lugthart '414
<p>11[a] The method of claim 10, further comprising: after connecting the electrical conductors, characterizing channel characteristics of the electrical conductors to determine the transmit filter coefficient values; and</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. Lugthart '414 discloses the subject matter of claim limitation 11[a] for the same reasons that Lugthart '414 discloses the subject matter of claim 4. <i>See, e.g.,</i> claim 4. An ordinarily skilled artisan would have had reasons to determine transmit filter 17 coefficient values by training as part of the cable manufacture after connecting transceivers 107a/107b in order to provide the initial pre-set coefficient values. <i>See, e.g.,</i> Lugthart '414 at 4:32-64, 49:3-12, 49:20-37 (describing training). To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>11[b] storing the transmit filter coefficient values in the non-volatile memories.</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation. Lugthart '414 discloses the subject matter of claim limitation 11[b] for the same reasons that Lugthart '414 discloses the subject matter of claim 4. <i>See, e.g.,</i> claim 4. To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

L. DEPENDENT CLAIM 12

Claim 12	Lugthart '414
<p>12. The method of claim 11, wherein the first and second DRR devices employ receiver-based equalization of the electrical transit signals using coefficient values stored in the non-volatile memories.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>The '233 Patent specification repeats the “receiver-based equalization” language of dependent claim 5, but fails to provide any explanation of what the phrase means. <i>See, e.g.</i>, '233 Patent at 2:42-45, 2:61-63. Nevertheless, “receiver-based equalization” is met by equalizing a received signal to compensate for distortion incurred during transmission. <i>See, e.g.</i>, U.S. Patent No. 9,178,542 at 10:22-35; U.S. Patent App. Pub. No. 2005/0078758 at [0004]; U.S. Patent No. 7,570,708 at 2:17-21; Pavan Kumar Hanumolu, <i>et al.</i>, “Equalizers for High-Speed Serial Links,” International Journal of High Speed Electronics and Systems, vol. 15, no. 2, 2005 (“Hanumolu”) at p.185 (describing “receive-side equalization” suppressing channel loss).</p> <p>The transceivers equalize signals received over conductive lines 111 (e.g., electrical transit signals) using receive path equalizer 21 to improve signal fidelity. <i>See</i> Lugthart '414 at 9:14-29 (“receive path equalizer 21 can be used to provide signal equalization to compensate for transmission line losses on the line side” such as “to compensate for high-frequency signal loss by boosting high frequency components of a signal relative to low frequency components of the signal, thereby improving signal fidelity.”). As part of the transceivers, receive path equalizers 21 in transceivers 107a and 107b would be in the first and second DRR devices, respectively. <i>See, e.g.</i>, claim limitations 1[a], 1[b].</p> <p>Receive path equalizers 21 are performing an equalization function analogous to that performed by transmit filters 17. It would have been obvious to implement transmit filters 17 in Lugthart '414 using coefficient values stored in non-volatile memories, and it would have been obvious to implement equalizers 21 with coefficient values stored in the nonvolatile memories.</p> <p>Lugthart '414 suggests that equalizers 21 are, like filters 17, configured to compensate for signal distortion over the cable. <i>See</i> Lugthart '414 at 22:49-54 (“The equalizer 21 can be configured to compensate for losses occurring during transmission over the cable....”).</p> <p>The equalization functionality of equalizer 21 depends on filter coefficient settings like transmit filter 17. <i>See, e.g.</i>, Hanumolu at pp. 185-198 (describing different receive-side equalization architectures</p>

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Claim 12	Lugthart '414
	<p>configured with coefficients [C-1, C0, C1]); U.S. Patent App. Pub. No. 2014/0281068 at [0069] (describing applying coefficients to a receiver's settings to minimize communication data loss).</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

M. DEPENDENT CLAIM 13

Claim 13	Lugthart '414
<p>13. The method of claim 11, wherein the electrical conductors comprise twin-axial conductors that carry each of the electrical transit signals in differential form.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>The active cable of Lugthart '414 includes at least one twin-axial cable, which includes at least two inner conductors that provide differential signaling. See Lugthart '414 at 19:9-13 (“a cable can include twinaxial cables (‘Twinax’), where each Twinax cable includes two inner conductors... [and] the two inner conductors can be configured to implement differential signaling.”). The twin-axial cable’s inner conductors are twin-axial conductors. See U.S. Patent No. 9,172,578 at 3:41-45 (“twinaxial (or ‘twinax’) cables... can each comprise a full-duplex twinax pair of conductors”). The Twinax conductors transport signals (e.g., electrical transit signals) between the ends of the cable.</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

N. DEPENDENT CLAIM 14

Claim 14	Lugthart '414
<p>14. The method of claim 8, wherein the first and second DRR devices do not perform pre-equalization of the multi-lane data streams provided to the first and second host interface ports.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

O. INDEPENDENT CLAIM 15

Claim 15	Lugthart '414
<p>15[pre] A communications method that comprises:</p>	<p>To the extent the preamble is limiting, Lugthart '414 discloses and/or renders obvious this preamble. Lugthart '414 discloses the subject matter of the preamble of claim 15. <i>See, e.g.</i>, Lugthart '414 at Abstract, 1:40-41.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>15[a] inserting a first end connector plug of a cable into a first host interface port, the first end connector plug being connected to a first data recovery and re-modulation (DRR) device that converts a multi-lane data stream from the first host interface port into electrical transit signals conveyed by electrical conductors to a second DRR device connected</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 15[a] for the same reasons that Lugthart '414 discloses the subject matter of claim limitations 1[a], 1[c], and 1[d]. <i>See, e.g.</i>, claim 1.</p> <p>Lugthart '414 describes “[e]ach of the transceiver assemblies 105a and 105b has an input port that is configured to mechanically and electrically connect, e.g., in a releasable fashion, to a corresponding port ... on the respective electronic device 101a, 101b[.]” <i>See, e.g.</i>, Lugthart '414 at 15:47-57. An ordinarily skilled artisan would have had reasons to insert each input port in a corresponding electronic device’s port (host interface port) to use the cable of Lugthart '414 as shown in Lugthart '414 Figure 2A.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from</p>

Lugthart '414	
Claim 15	known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.
to a second end connector plug of the cable; and	known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.
15[b] inserting the second end connector plug of the cable into a second host interface port, the second DRR device converting a multi-lane data stream from the second host interface port into electrical transit signals conveyed by electrical conductors to the first DRR device,	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 15[b] for the same reasons that Lugthart '414 discloses the subject matter of claim limitations 1[a], 1[c], and 1[d]. <i>See, e.g.</i>, claim 1.</p> <p>An ordinarily skilled artisan had reasons to insert transceiver assembly 105b's input port in electronic device 101b's corresponding port (second host interface port) for the same reasons described for assemblies 105a / electronic device 101a. For example, Lugthart '414 describes "[e]ach of the transceiver assemblies 105a and 105b has an input port that is configured to mechanically and electrically connect, e.g., in a releasable fashion, to a corresponding port ... on the respective electronic device 101a, 101b[.]" <i>See, e.g.</i>, Lugthart '414 at 15:47-57.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
15[c] the first and second DRR devices providing pre-equalization of the electrical transit signals using transmit filter coefficient values stored	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 15[c] for the same reasons that Lugthart '414 discloses the subject matter of claim limitation 1[f]. <i>See, e.g.</i>, claim limitation 1[f].</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as</p>

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Claim 15	Lugthart '414
in non-volatile memories.	detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.

P. DEPENDENT CLAIM 16

Claim 16	Lugthart '414
<p>16[a] The method of claim 15, further comprising: supplying power to the first and second end connector plugs,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 16[a] for the same reasons that Lugthart '414 discloses the subject matter of claim 3. <i>See, e.g.,</i> claim 3. Each transceiver assembly input port (connector plug) is supplied power from the host device that electrically connects to the cable when the input port is coupled to the host device's corresponding receiving port.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>16[b] the first and second end connector plugs being connected to first and second controller devices, respectively,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 16[b] for the same reasons that Lugthart '414 discloses the subject matter of claim 3. <i>See, e.g.,</i> claim 3. Each transceiver assembly input port (connector plug) is connected to the controller of Lugthart '414 because, as explained for claim 3, the controller comprises part of the transceiver assembly, which is electrically connected to the input port.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

Claim 16	Lugthart '414
<p>16[c] each of the first and second controller devices operating to configure the first and second DRR devices in response to a power-on event,</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>Lugthart '414 discloses the subject matter of claim limitation 16[c] for the same reasons that Lugthart '414 discloses the subject matter of claim 3. <i>See, e.g.</i>, claim 3. An ordinarily skilled artisan would have found such an implementation of Lugthart '414 obvious, as Lugthart '414 already discloses programmable circuitry. <i>See, e.g.</i>, Lugthart '414 at 30:44-46 (“Programmable chip sets, physical coding sublayer (PCS) blocks, FPGAs, FIR filters can be used to condition and multiplex the digital data signal.”). As the first and second DRR devices include the transceivers, an ordinarily skilled artisan would have understood that Lugthart '414 discloses “the first and second DRR devices are programmed.”</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>
<p>16[d] the configuring including retrieving the transmit filter coefficient values from internal non-volatile memory.</p>	<p>Lugthart '414 discloses and/or renders obvious this limitation.</p> <p>To the extent that this preamble is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this preamble as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

Q. DEPENDENT CLAIM 17

<p>Claim 17</p>	<p>Lugthart '414</p>
<p>17. The method of claim 15, wherein the first and second DRR devices are programmed to use the transmit coefficient values each time power is supplied to the first and second end connector plugs.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>For the limited purpose of this analysis, the phrase “transmit coefficient values” is interpreted as referring to “transmit filter coefficient values,” (see, e.g., claim limitation 1[f]) as the term otherwise has no antecedent basis.</p> <p>An ordinarily skilled artisan would have found such an implementation of Lugthart '414 obvious, as Lugthart '414 already discloses programmable circuitry. See, e.g., Lugthart '414 at 30:44-46 (“Programmable chip sets, physical coding sublayer (PCS) blocks, FPGAs, FIR filters can be used to condition and multiplex the digital data signal.”). As the first and second DRR devices include the transceivers, an ordinarily skilled artisan would have understood that Lugthart '414 discloses “the first and second DRR devices are programmed.”</p> <p>Power-up indicates that power is supplied to the first and second end connector plugs. An ordinarily skilled artisan would have understood that power is supplied from a host device when the enclosing connector’s connector plug was electrically connected to the host interface port in a corresponding electronic device 101a/b as described claim limitation 1[a] because this was conventionally how standardized connectors like QSFP or SFP worked. See, e.g., Lugthart '414 at 15:41-57 (describing connector formats); see also SFF-8436 at 21 (“A host board together with the QSFP+ module(s) forms an integrated power system. The host supplies stable power to the module.”), 22 Fig. 4 (“Recommended Host Board Power Supply Filtering”). Regardless, an ordinarily skilled artisan would have found it conventional and obvious to implement Lugthart '414 with QSFP connectors powered by a connected host device.</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from</p>

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Claim 17	Lugthart '414
	known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.

R. DEPENDENT CLAIM 18

<p>Claim 18</p>	<p>Lugthart '414</p>
<p>18. The method of claim 17, wherein the transmit filter coefficient values are determined and stored in the non-volatile memories after assembly of the cable.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. EEPROM is electrically erasable programmable read only memory, e.g., rewritable NVM. An ordinarily skilled artisan would have known that flash memory was another well-known rewritable non-volatile memory (e.g., "EEPROM or the like") conventionally used with transmit FIR filters. <i>See, e.g., U.S. Patent No. 6,975,140 at 3:42-4:2</i> ("Any type of NVRAM can be used as the rewritable non-volatile storage, so long as [it] is of the type suitable for integration on an integrated circuit."). An ordinarily skilled artisan would have understood such memories would be used when the content of those memories is both re-programmed and preserved through startup/power-up, initialization or re-initialization.</p> <p>Thus, an ordinarily skilled artisan would have included rewritable non-volatile memory that could be updated with new coefficient values that fine-tuned pre-equalization or equalization with new coefficient values learned through training at manufacture or during usage with a particular device in a particular environment. <i>See, e.g., Lugthart '414 at 48:64-49:12, 49:20-37; see also U.S. Patent No. 6,975,140 at 3:42-4:2, 9:21-28.</i> Preserving such adapted pre-equalization filter coefficients in rewritable non-volatile memory like an EEPROM would have ensured that the fine-tuned coefficients remained available after an AEC transceiver—or the host powering it—was power cycled, initialized, or re-initialized.</p> <p>Regardless, an ordinarily skilled artisan would have known that storing updated filter coefficients in non-volatile memory was conventional and desirable so that the adapted coefficient values would be available after power cycling the active electric cable transceiver by unplugging it from a host device powering it, or power cycling the host device powering the active element cable transceiver. <i>See U.S. Patent No. 6,975,140 at Abstract</i> ("[D]ata transmitter includes a rewritable non-volatile storage, operable to be rewritten with control information representing the values of coefficients updated during operation off the FIR driver."), <i>2:46-49 (same), 3:45-52</i> ("Updated values of the coefficients used in the taps of the FIR transmitter 30 are determined and stored to the flash memory 20 during the operation of the FIR transmitter. When the FIR transmitter is powered off and back on again, the coefficient values as last updated are available to be retrieved from the flash memory 20 and applied to the taps of the FIR transmitter again.").</p>

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Claim 18	Lugthart '414
	<p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

S. DEPENDENT CLAIM 19

Claim 19	Lugthart '414
<p>19. The method of claim 18, wherein the first and second DRR devices employ receiver-based equalization of the electrical transit signals using coefficient values stored in the non-volatile memories.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim.</p> <p>The '233 Patent specification repeats the “receiver-based equalization” language of dependent claim 5, but fails to provide any explanation of what the phrase means. <i>See, e.g.</i>, '233 Patent at 2:42-45, 2:61-63. Nevertheless, “receiver-based equalization” is met by equalizing a received signal to compensate for distortion incurred during transmission. <i>See, e.g.</i>, U.S. Patent No. 9,178,542 at 10:22-35; U.S. Patent App. Pub. No. 2005/0078758 at [0004]; U.S. Patent No. 7,570,708 at 2:17-21; Pavan Kumar Hanumolu, <i>et al.</i>, “Equalizers for High-Speed Serial Links,” International Journal of High Speed Electronics and Systems, vol. 15, no. 2, 2005 (“Hanumolu”) at p.185 (describing “receive-side equalization” suppressing channel loss).</p> <p>The transceivers equalize signals received over conductive lines 111 (e.g., electrical transit signals) using receive path equalizer 21 to improve signal fidelity. <i>See</i> Lugthart '414 at 9:14-29 (“receive path equalizer 21 can be used to provide signal equalization to compensate for transmission line losses on the line side” such as “to compensate for high-frequency signal loss by boosting high frequency components of a signal relative to low frequency components of the signal, thereby improving signal fidelity.”). As part of the transceivers, receive path equalizers 21 in transceivers 107a and 107b would be in the first and second DRR devices, respectively. <i>See, e.g.</i>, claim limitations 1[a], 1[b].</p> <p>Receive path equalizers 21 are performing an equalization function analogous to that performed by transmit filters 17. It would have been obvious to implement transmit filters 17 in Lugthart '414 using coefficient values stored in non-volatile memories, and it would have been obvious to implement equalizers 21 with coefficient values stored in the nonvolatile memories.</p> <p>Lugthart '414 suggests that equalizers 21 are, like filters 17, configured to compensate for signal distortion over the cable. <i>See</i> Lugthart '414 at 22:49-54 (“The equalizer 21 can be configured to compensate for losses occurring during transmission over the cable....”).</p> <p>The equalization functionality of equalizer 21 depends on filter coefficient settings like transmit filter 17. <i>See, e.g.</i>, Hanumolu at pp. 185-198 (describing different receive-side equalization architectures</p>

Exhibit A-1

Claim 19	Lugthart '414
	<p>configured with coefficients [C-1, C0, C1]); U.S. Patent App. Pub. No. 2014/0281068 at [0069] (describing applying coefficients to a receiver's settings to minimize communication data loss).</p> <p>To the extent that this claim is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>

T. DEPENDENT CLAIM 20

Claim 20	Lugthart '414
<p>20. The method of claim 15, wherein the first and second DRR devices do not perform pre-equalization of the multi-lane data streams provided to the first and second host interface ports.</p>	<p>Lugthart '414 discloses and/or renders obvious this claim. To the extent that this limitation is not disclosed, either explicitly or inherently, by Lugthart '414, this limitation is obvious to a person of ordinary skill in the art based on (1) Lugthart '414 alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this limitation as detailed in the Cover Pleading, this Exhibit, and/or invalidity claim charts. The motivations to modify or combine may come from, for example, the knowledge of the person of ordinary skill themselves, or from known problems and predictable solutions as embodied in these references, examples of which are discussed in the Cover Pleading or in this Exhibit.</p>