Exhibit B-4

Invalidity of U.S. Patent No. 11,012,252 (the "'252 Patent") in View of U.S. Patent No. 8,516,238 ("Cornelius")

Cornelius was filed on June 30, 2011, published Jan. 5, 2012, and claims priority to U.S. provisional application Nos. 61/360,436 and 61/360,432, filed on June 30, 2010. Cornelius issued on Aug. 20, 2013. Cornelius qualifies as prior art under at least 35 U.S.C. § §102(a) (AIA).

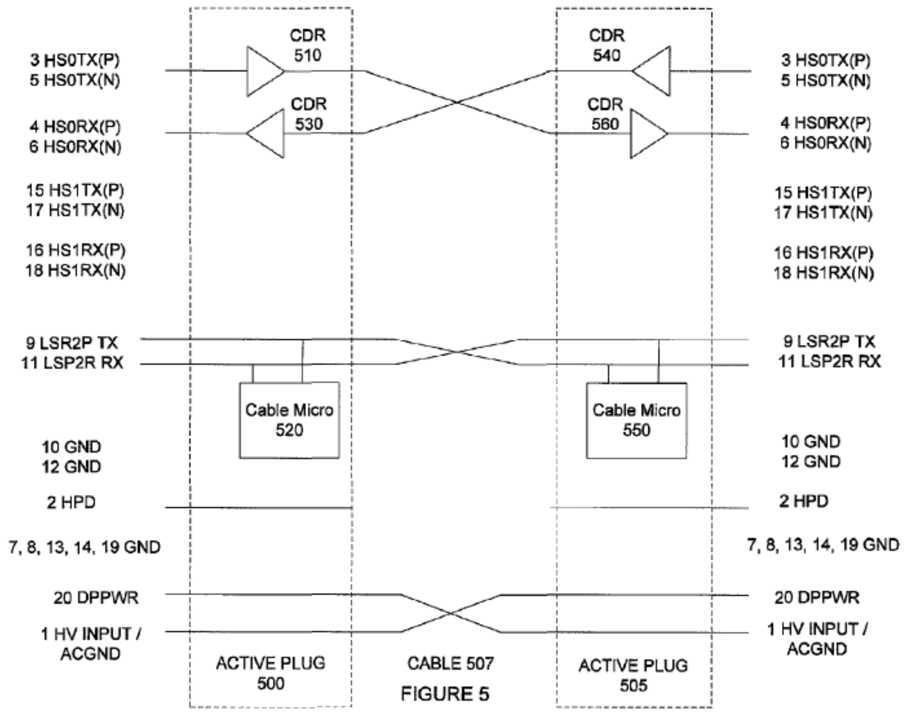
The Administrative Law Judge has not yet construed the claims and therefore the meaning of the terms in the claims has yet to be resolved. The support identified here for limitations of the Asserted Claims of the '252 Patent is responsive to Complainant's apparent infringement contentions in its Complaint, 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 '252 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 Cornelius does not disclose any particular limitation of the Asserted Claims of the '252 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 '252 Patent to modify Cornelius and/or to combine the teachings of Cornelius 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 '252 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 '252 Patent that it contends is not fully disclosed by Cornelius, 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.

A. INDEPENDENT CLAIM 1

<table>
<tr><th>Claim 1</th><th>Cornelius</th></tr>
<tr><td>1[pre] An active Ethernet cable that comprises:</td><td>To the extent the preamble is limiting, Cornelius discloses and/or renders obvious this limitation.


Cornelius, Figure 5.</td></tr>
</table>

Exhibit B-4

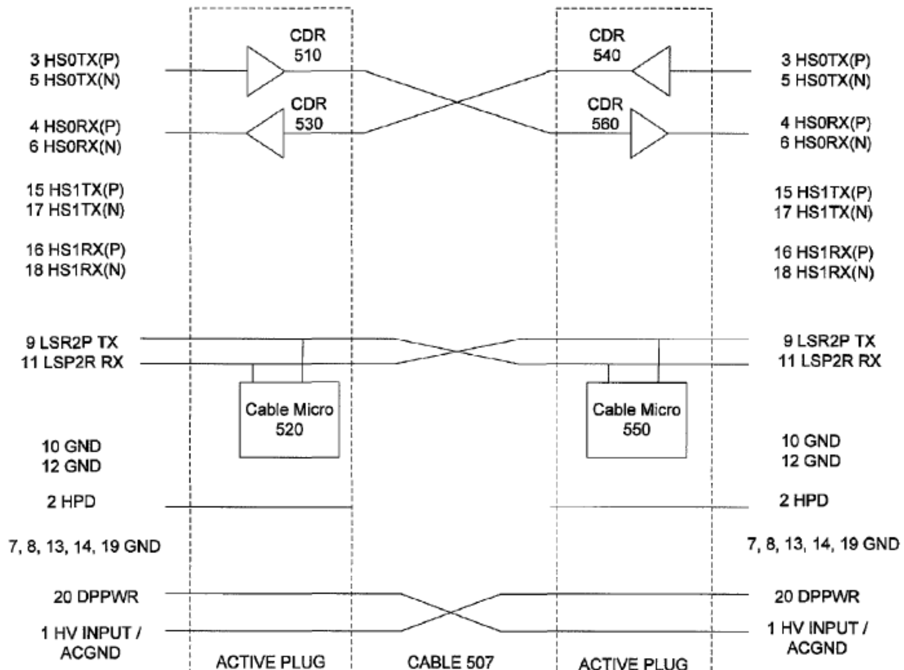
Claim 1	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 1	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 1	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 1	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 1	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
1[a] electrical conductors connected between a first connector and a second connector,	Cornelius discloses and/or renders obvious this limitation.

Claim 1	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 1	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29. To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
1[b] each of the first and	Cornelius discloses and/or renders obvious this limitation.

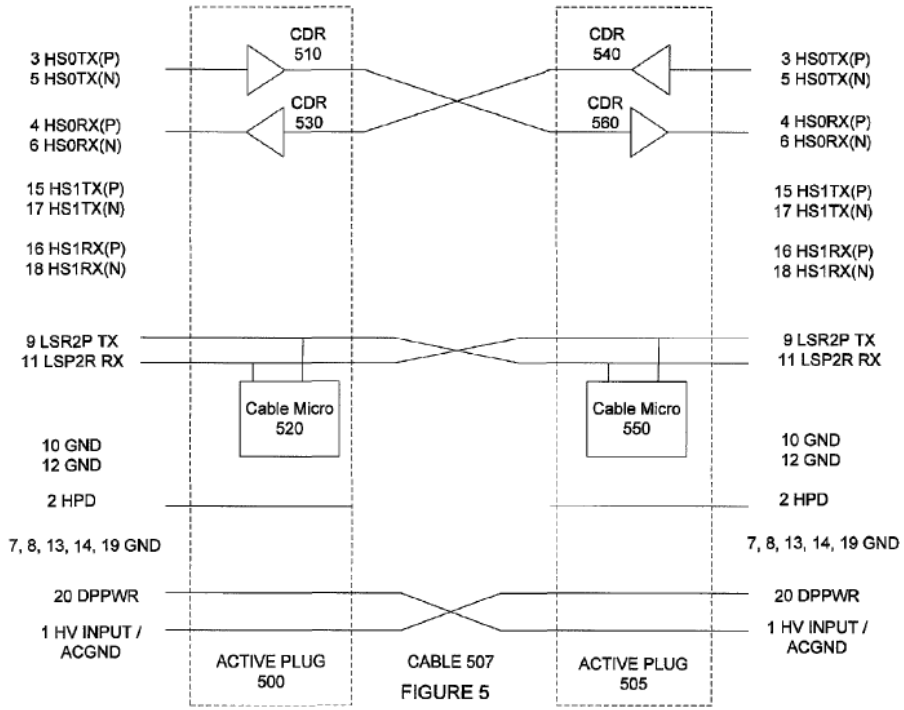
Claim 1	Cornelius
second connectors being adapted to fit into an Ethernet port of a corresponding host device to receive from that host device an electrical input signal conveying an inbound data stream to the cable and to provide to that host device an electrical output signal conveying an outbound data stream from the cable,	 Cornelius, Figure 5.

Exhibit B-4

Claim 1	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

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	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 1	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 1	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

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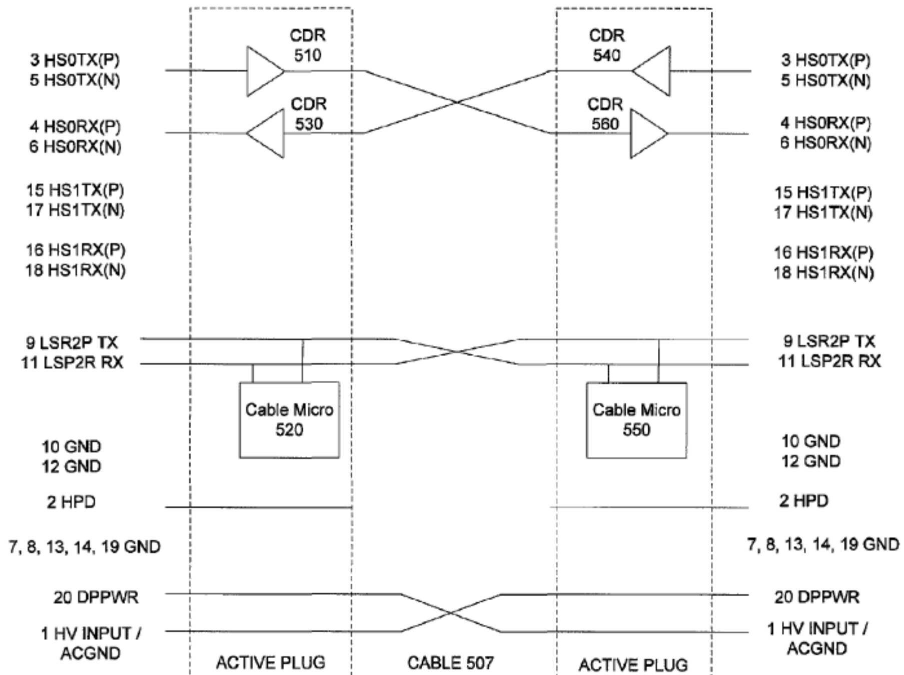
1[c] each of the first and second connectors including a respective transceiver that performs clock and data recovery on the electrical input signal to extract and re-modulate the inbound data stream for transit via the electrical conductors as a respective electrical transit signal conveying a transit data stream,	Cornelius discloses and/or renders obvious this limitation.

Claim 1	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

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	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

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1[d] the respective transceiver for each of the first and second connectors performing clock and data recovery on the respective electrical transit signal to extract and remodulate the transit data stream as the outbound data stream from the cable, and	Cornelius discloses and/or renders obvious this limitation.

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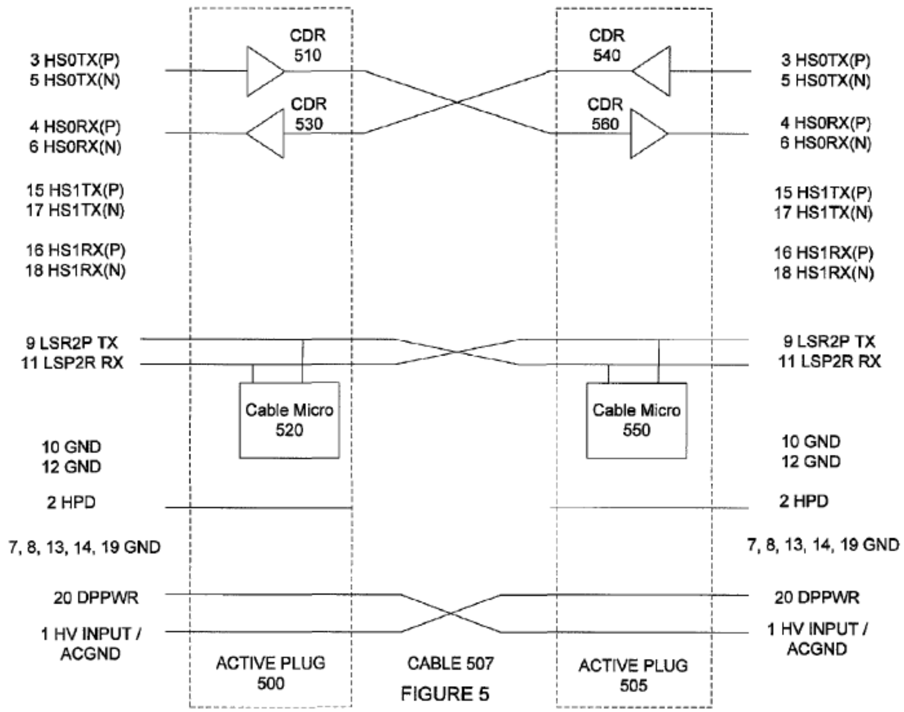
<tr><td></td><td>

Cornelius, Figure 5.

Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.</td></tr>
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Claim 1	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
1[e] the respective transceivers each employing fixed, cable-independent equalization parameters for each of: the remodulation of the transit data stream as the outbound data stream, and the clock and data recovery performed on the electrical input signal.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 1	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 1	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Exhibit B-4

Claim 1	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

B. DEPENDENT CLAIM 2

Claim 2	Cornelius
2[a] The active Ethernet cable of claim 1,wherein the respective transceivers each employ cable-dependent equalization parameters for at least one of: the remodulation of the inbound data stream for transit, and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 2	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 2	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 2	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
2[b] the clock and data recovery performed on the electrical transit signal.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 2	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 2	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 2	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

C. DEPENDENT CLAIM 3

Claim 3	Cornelius
3. The active Ethernet cable of claim 2, wherein said cable-dependent equalization parameters adapt during usage of the Ethernet cable.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 3	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 3	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 3	**Cornelius**
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

D. DEPENDENT CLAIM 4

Claim 4	Cornelius
4[a] The active Ethernet cable of claim 2, wherein said cable-dependent equalization parameters are fixed during normal usage of the Ethernet cable, and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 4	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 4	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

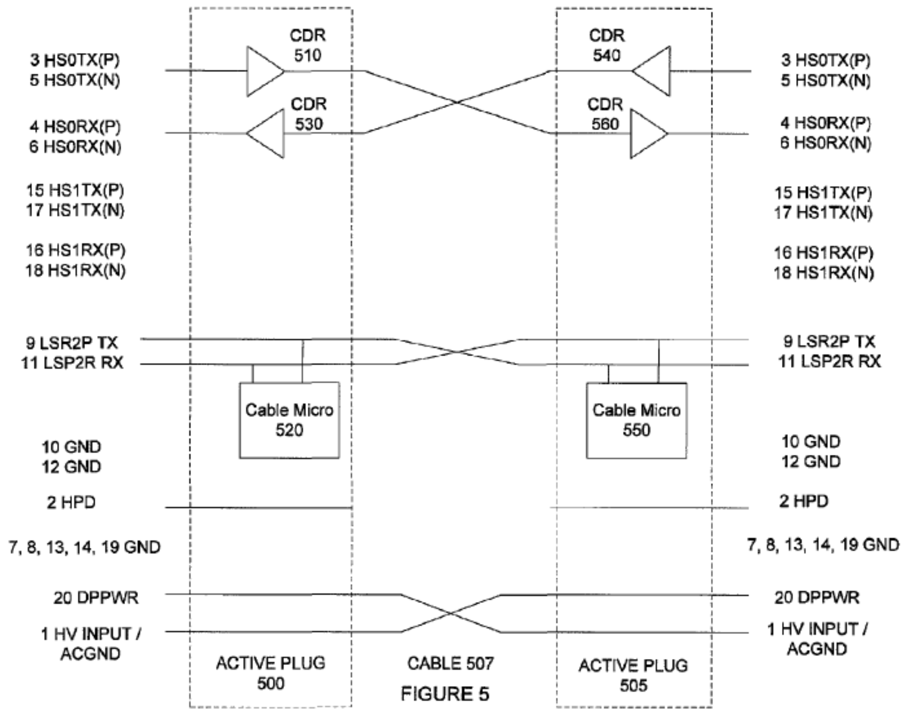
Claim 4	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
4[b] wherein said cable-dependent equalization parameters are determined during manufacturing-testing of the Ethernet cable.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 4	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 4	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 4	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

E. DEPENDENT CLAIM 5

Claim 5	Cornelius
5. The active Ethernet cable of claim 4, wherein the inbound data stream and the outbound data stream each have a per-lane symbol rate in excess of 50 GBd.	Cornelius discloses and/or renders obvious this limitation.  Cornelius, Figure 5.

Claim 5	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

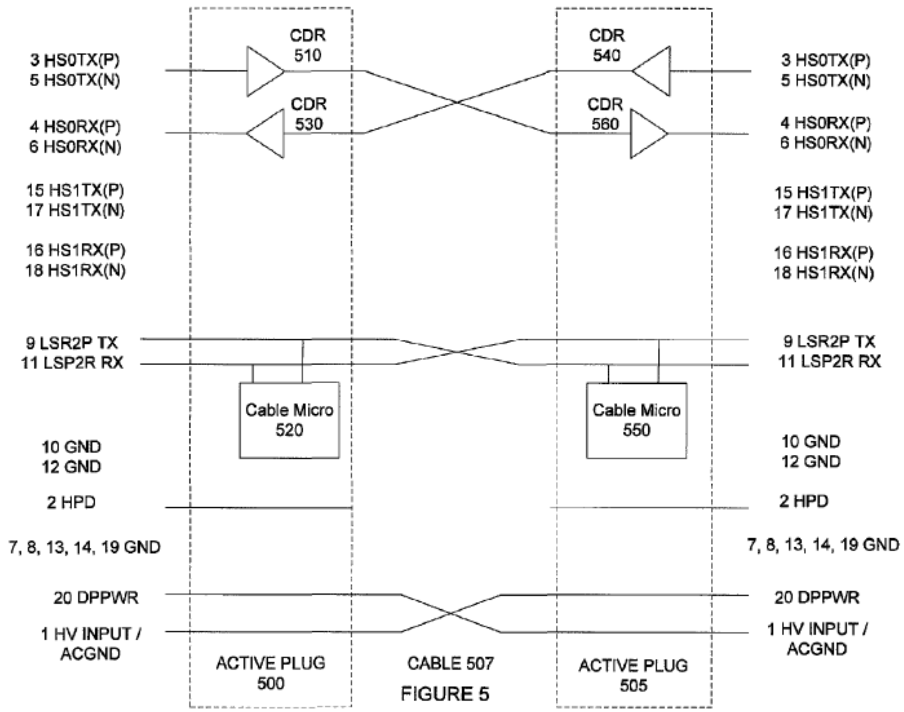
Claim 5	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 5	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 5	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 5	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

F. INDEPENDENT CLAIM 6

Claim 6	Cornelius
6[pre] A communication method that comprises, in a network cable having conductor pairs electrically connecting a first connector to a second connector	To the extent the preamble is limiting, Cornelius discloses and/or renders obvious this limitation.  Cornelius, Figure 5.

Claim 6	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

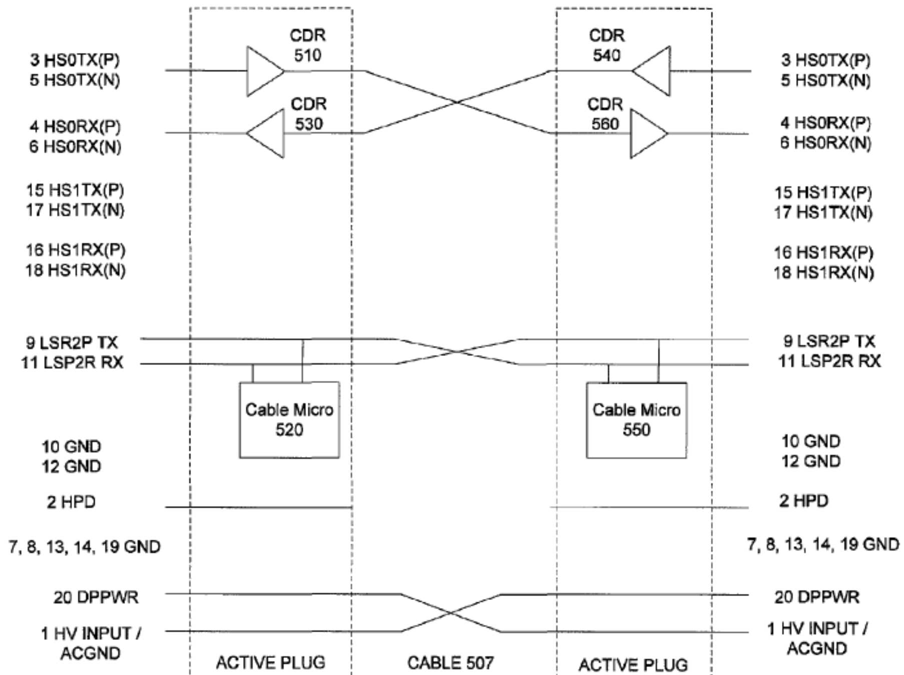
Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[a] receiving with the first connector a first electrical input signal conveying a first inbound data stream from a first host device;	Cornelius discloses and/or renders obvious this limitation.

Exhibit B-4

Claim 6	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

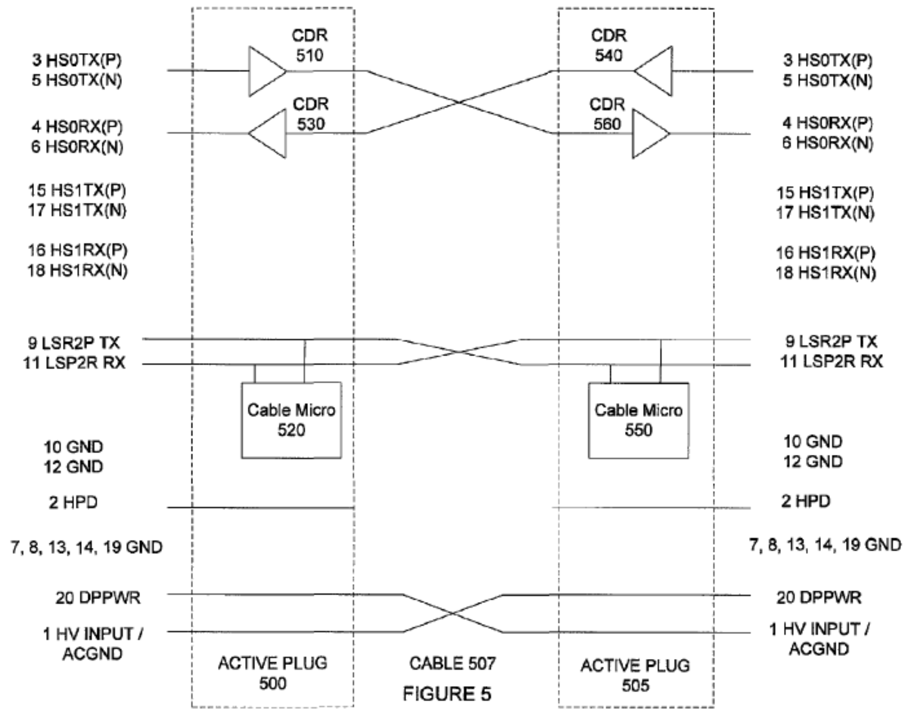
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits.

Claim 6	Cornelius
	Cornelius, 12:6-21. To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[b] performing clock and data recovery on the first electrical input signal with a first transceiver in the first connector to extract the first inbound data stream;	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

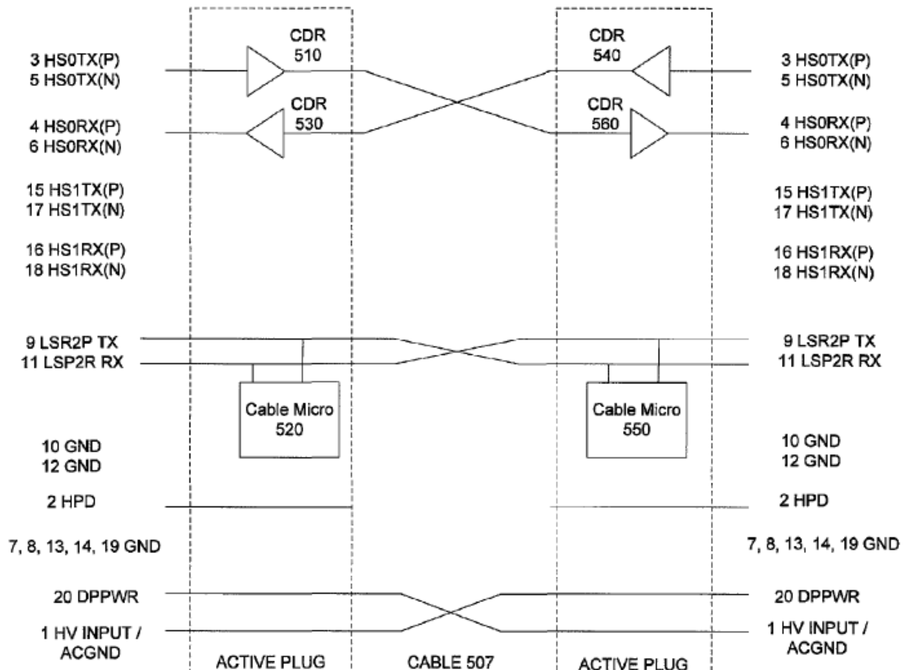
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[c] re-modulating the first inbound data stream as a first transit data stream conveyed by a first electrical transit signal over a first of the conductor pairs;	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

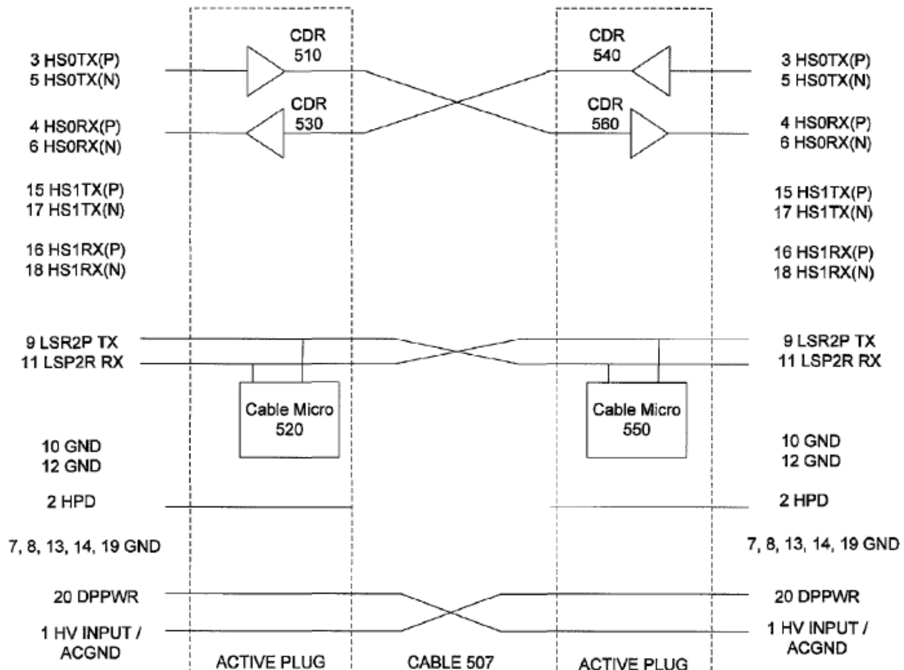
Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[d] receiving with the second connector a second electrical input signal conveying a second inbound data stream from a second host device;	Cornelius discloses and/or renders obvious this limitation.

Exhibit B-4

Claim 6	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

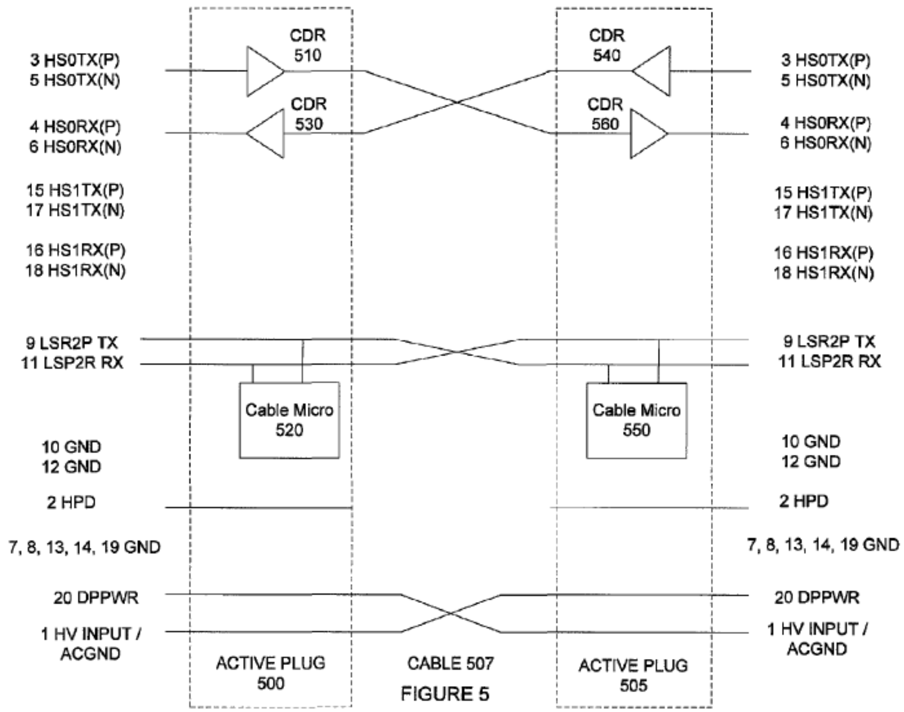
Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Exhibit B-4

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[e] performing clock and data recovery on the second electrical input signal with a second transceiver in the second connector to extract the second inbound data stream;	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

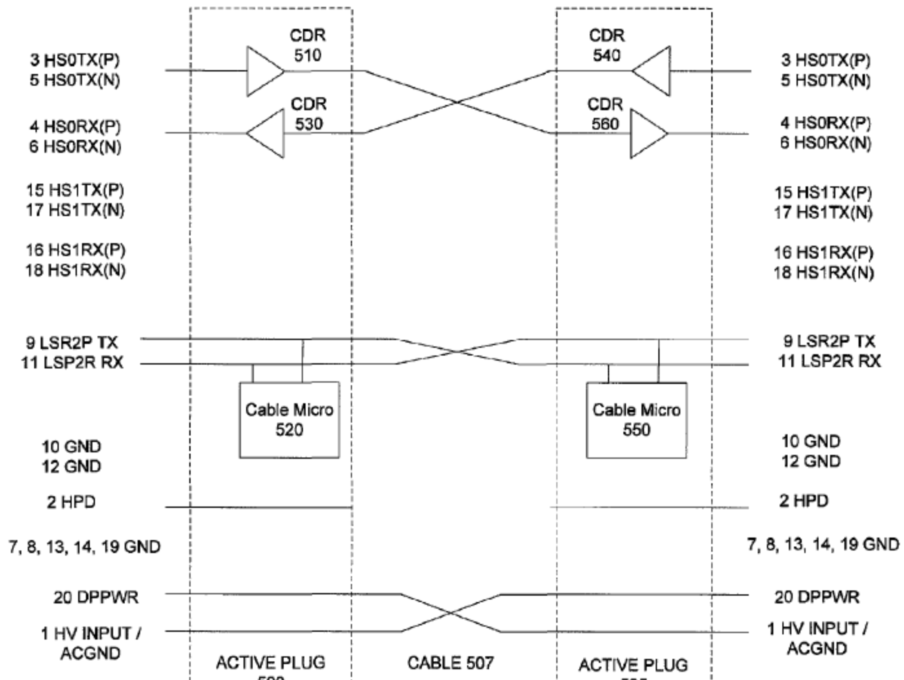
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[f] re-modulating the second inbound data stream as a second transit data stream conveyed by a second electrical transit signal over a second of the conductor pairs;	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

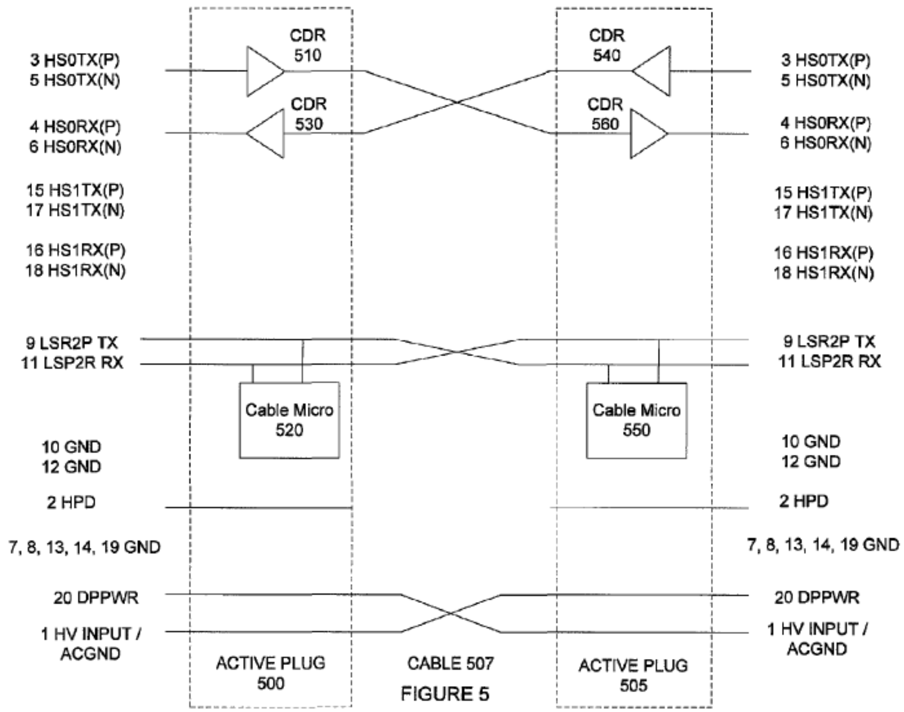
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[g] performing clock and data recovery on the first electrical transit signal with the second transceiver to extract the first transit data stream;	Cornelius discloses and/or renders obvious this limitation.

<table>
<tr><th>Claim 6</th><th>Cornelius</th></tr>
<tr><td></td><td>
Cornelius, Figure 5.

Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.</td></tr>
</table>

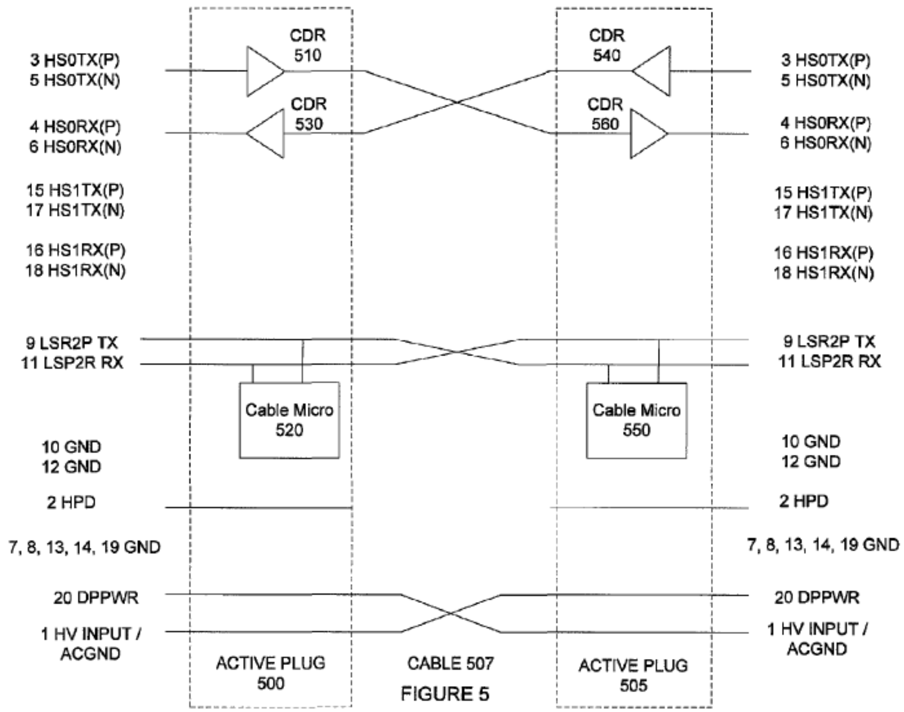
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[h] re-modulating the first transit data stream as a second outbound data stream conveyed by a second electrical output signal to the second host device;	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

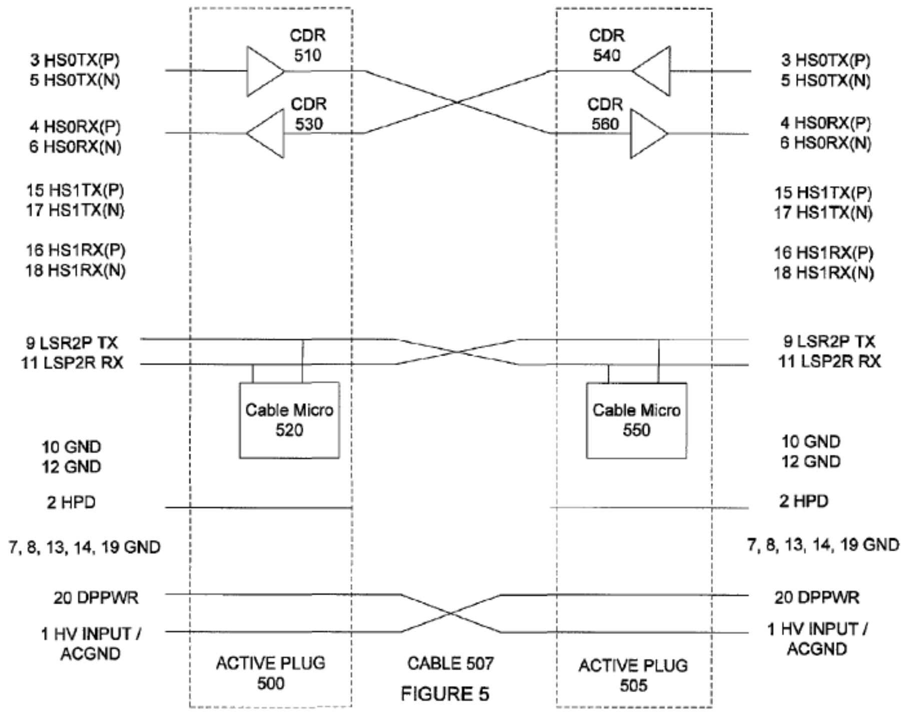
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[i] performing clock and data recovery on the second electrical transit signal with the first transceiver to extract the second transit data stream; and	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

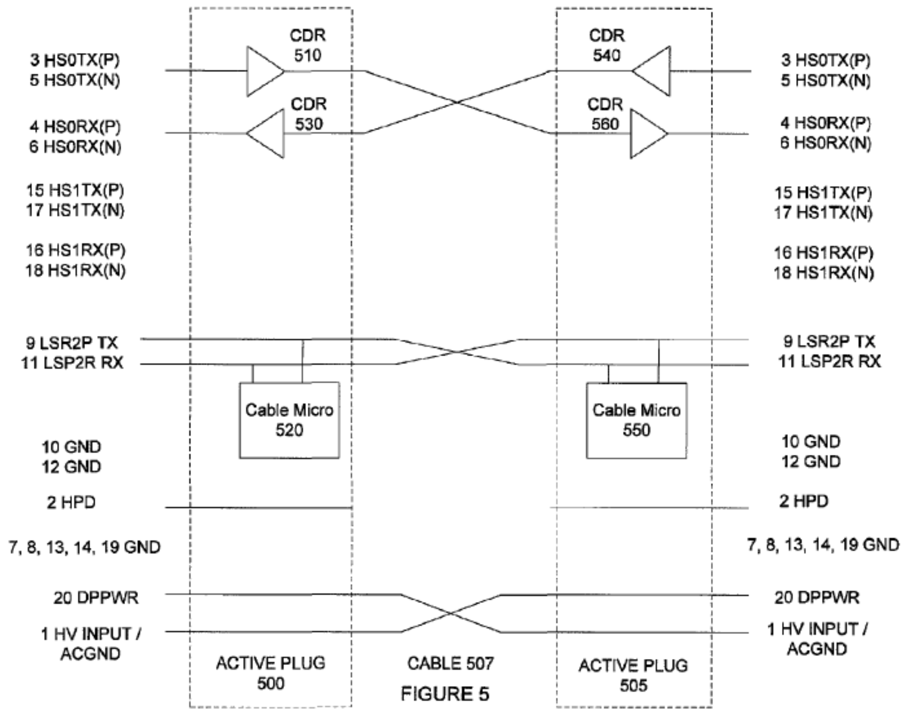
Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[j] re-modulating the second transit data stream as a first outbound data stream conveyed by a first electrical output signal to the first host device,	Cornelius discloses and/or renders obvious this limitation.

Claim 6	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 6	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 6	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
6[k] wherein said re-modulating the first transit data stream, said remodulating the second transit data stream, said performing clock and data recovery on the first electrical input signal, and said performing clock and data recovery on the second electrical input signal, each employ fixed, cable-independent, equalization parameters.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 6	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 6	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 6	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

G. DEPENDENT CLAIM 7

Claim 7	Cornelius
7[a] The communication method of claim 6, wherein cable-dependent equalization parameters are employed for at least one of: re-modulating the first inbound data stream,	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 7	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 7	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 7	**Cornelius**
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
7[b] re-modulating the second inbound data stream,	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 7	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 7	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Exhibit B-4

Claim 7	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
7[c] said performing clock and data recovery on the first electrical transit signal, and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 7	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 7	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 7	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
7[d] said performing clock and data recovery on the second electrical input signal,	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 7	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 7	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 7	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
7[e] each employ fixed, cable-independent, equalization parameters.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 7	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 7	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 7	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

H. Dependent Claim 8

Claim 8	Cornelius
8. The communication method of claim 7, wherein said cable-dependent equalization parameters are adaptively updated.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 8	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 8	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 8	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

I. DEPENDENT CLAIM 9

Claim 9	Cornelius
9[a] The communication method of claim 7, wherein said cable-dependent equalization parameters are fixed during normal usage, and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 9	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 9	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

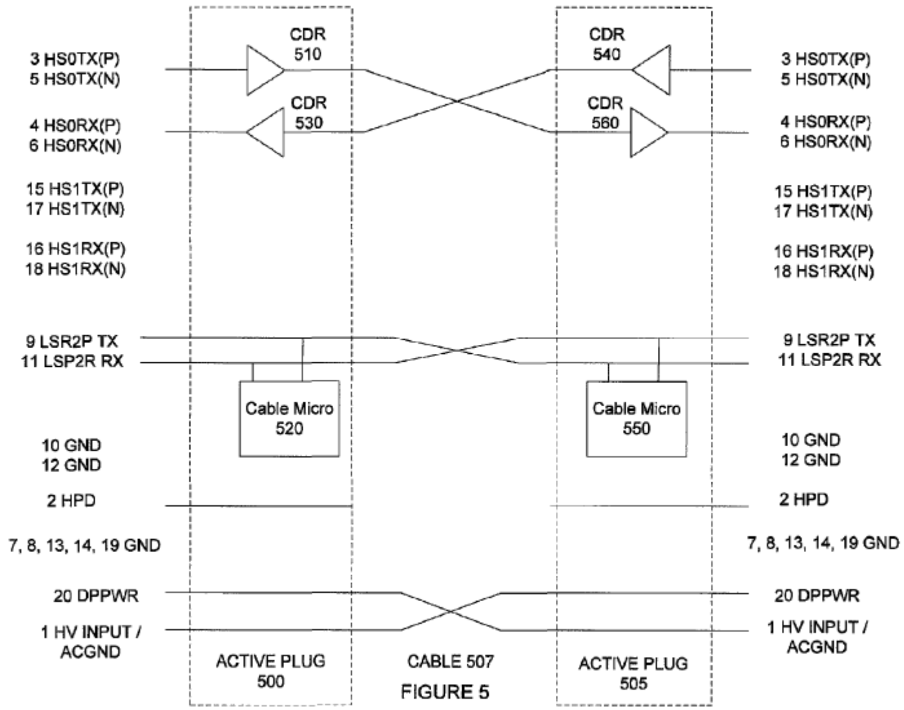
Claim 9	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
9[b] wherein the method further comprises: determining said cable-dependent equalization parameters during manufacturer-testing of the network cable.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 9	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 9	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 9	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

J. DEPENDENT CLAIM 10

Claim 10	Cornelius
10. The communication method of claim 9, wherein the first inbound data stream has a per-lane symbol rate in excess of 50 GBd.	Cornelius discloses and/or renders obvious this limitation.  Cornelius, Figure 5.

Claim 10	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

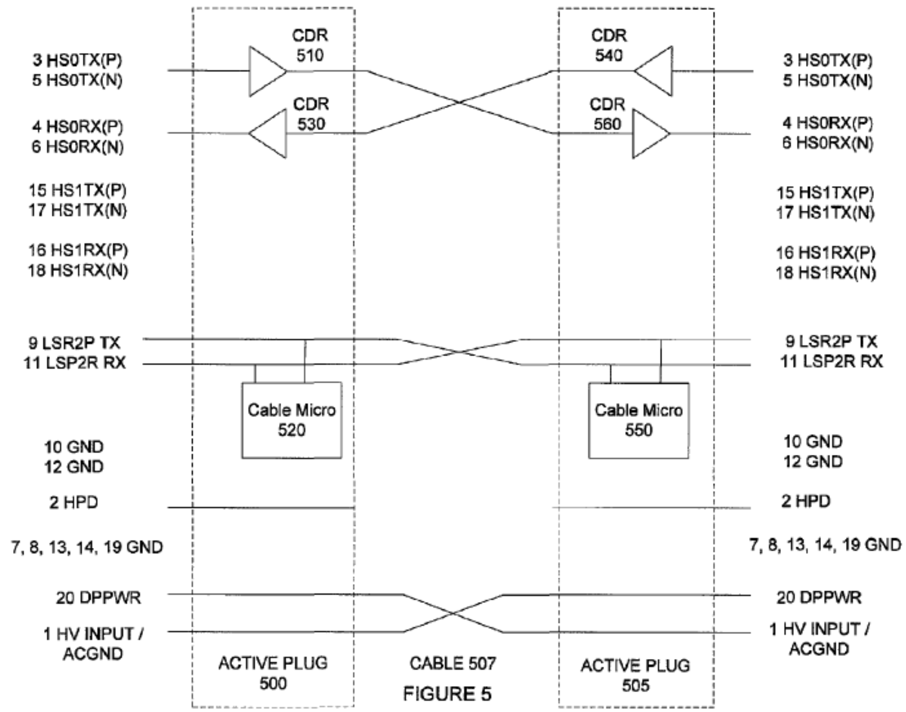
Claim 10	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 10	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 10	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 10	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

K. INDEPENDENT CLAIM 11

Claim 11	Cornelius
11[pre] A cable manufacturing method that comprises:	To the extent the preamble is limiting, Cornelius discloses and/or renders obvious this limitation.  Cornelius, Figure 5.

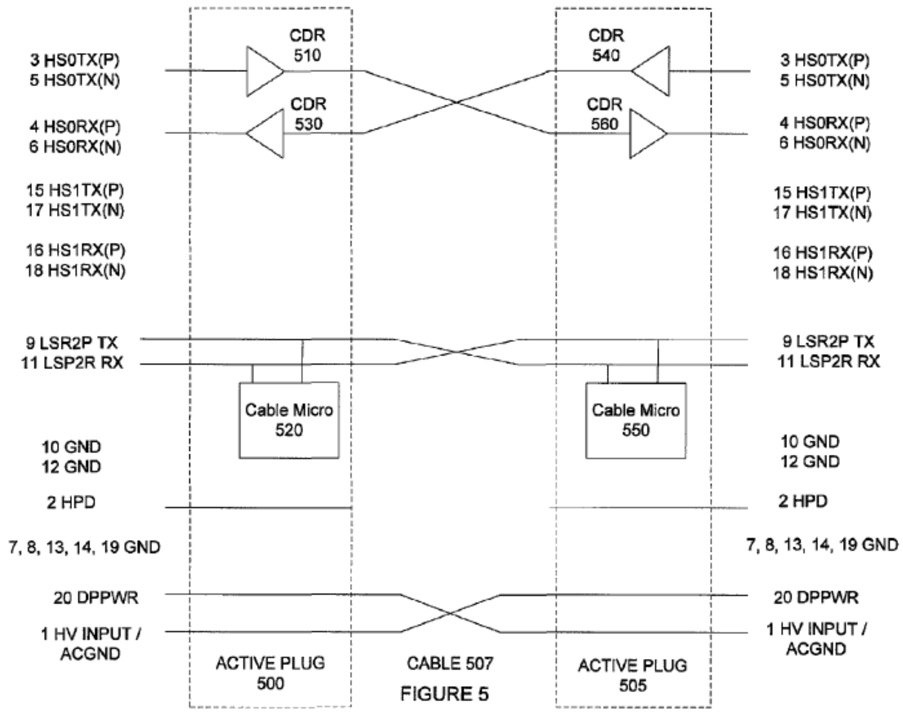
Claim 11	Cornelius
	Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true. Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[a] connecting a first end and a second end of a set of conductor pairs to a first transceiver and a second transceiver, respectively, to transport a first electrical transit signal from the first transceiver to the second transceiver and a second electrical transit signal from the second transceiver to the first transceiver;	Cornelius discloses and/or renders obvious this limitation.

Claim 11	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

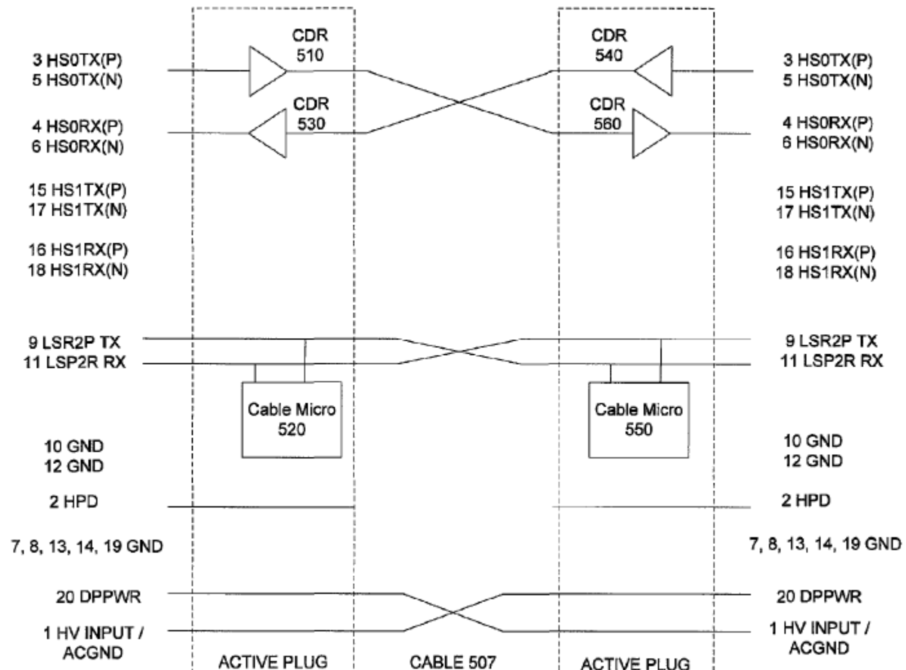
Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[b] packaging the first transceiver into a first connector configured to couple a first electrical input signal from a network interface port of a first host device to the first transceiver and a first electrical output signal from the first transceiver to the network interface port of the first host device; and	Cornelius discloses and/or renders obvious this limitation.

Exhibit B-4

Claim 11	Cornelius
	 FIGURE 5 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

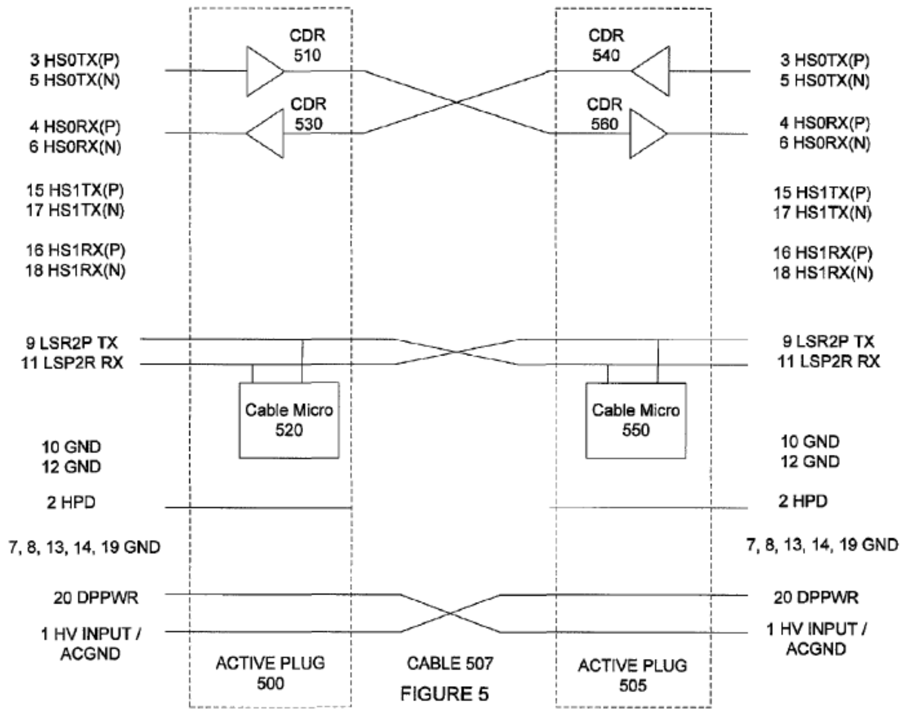
Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[c] packaging the second transceiver into a second connector configured to couple a second electrical input signal from a network interface port of a second host device to the second transceiver and a second electrical output signal from the second transceiver to the network interface port of the second host device,	Cornelius discloses and/or renders obvious this limitation.

Claim 11	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

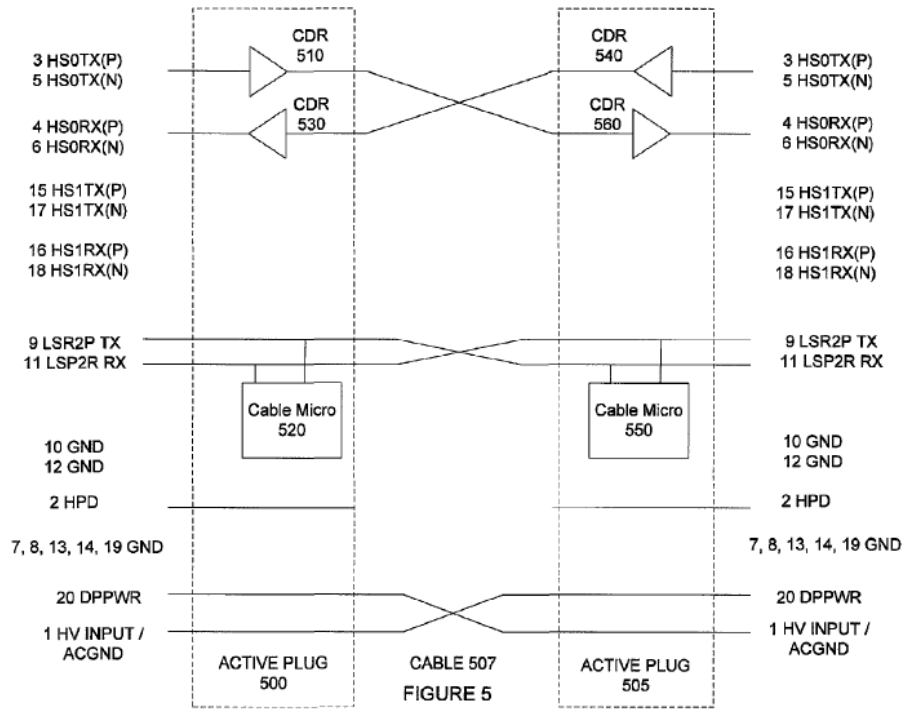
Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[d] the first and second transceivers being configured to perform clock and data recovery on the first and second electrical input signal to extract and re-modulate the first and second inbound data streams respectively as the first and second electrical transit signals conveying first and second transit data streams,	Cornelius discloses and/or renders obvious this limitation.

<table>
<tr><th>Claim 11</th><th>Cornelius</th></tr>
<tr><td></td><td>

Cornelius, Figure 5.

Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.</td></tr>
</table>

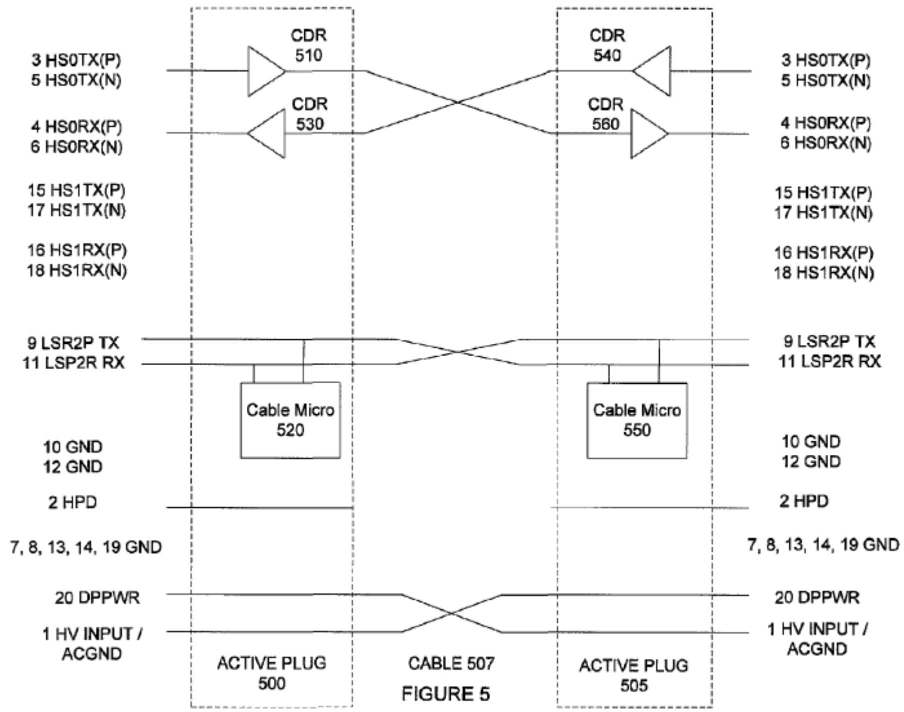
Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[e] configured to perform clock and data recovery on the second and first electrical transit signals to extract and re-modulate the second and first transit data streams as first and second outbound data streams conveyed by the first and second electrical output signals from the cable, and	Cornelius discloses and/or renders obvious this limitation.

Claim 11	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

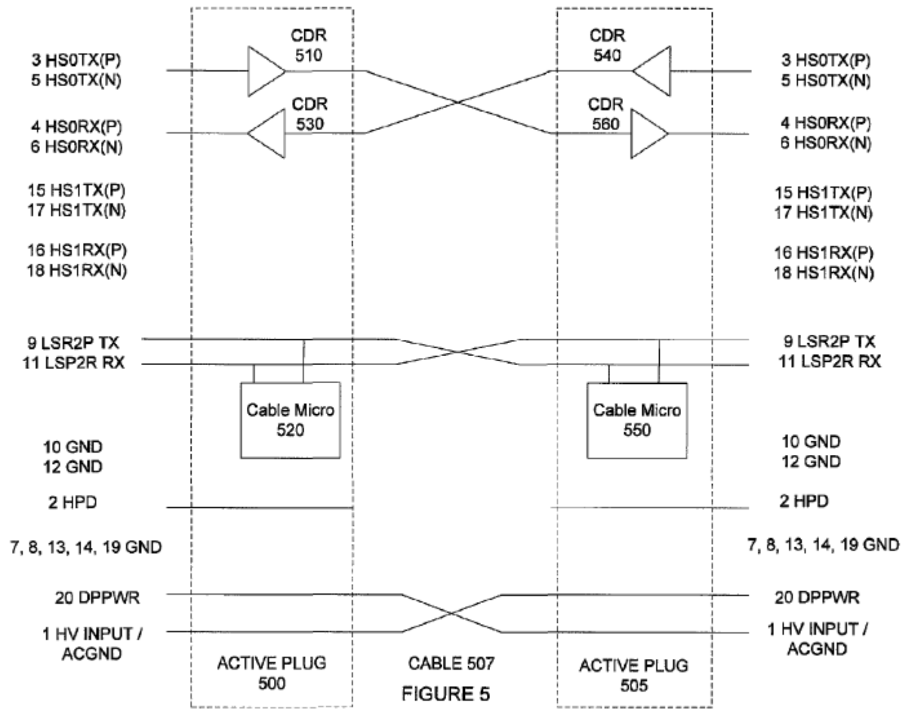
Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
11[f] each configured to employ fixed, cable-independent, equalization parameters for clock and data recovery on the respective electrical input signals and for generating the respective electrical output signals.	Cornelius discloses and/or renders obvious this limitation.

Claim 11	Cornelius
	 Cornelius, Figure 5. Accordingly, embodiments of the present invention provide circuits, methods, and apparatus that allow signals that are compliant with multiple standards to share a common connector on an electronic device. An exemplary embodiment of the present invention may provide a connector that provides signals compatible with a legacy standard in one mode and a newer standard in another mode. Typically, the legacy standard is slower, while the newer standard is faster, though this may not always be true.

Claim 11	Cornelius
	Cornelius, 1:55-63. FIG. **5** illustrates an active cable consistent with an embodiment of the present invention. For simplicity, only circuitry associated with the high-speed operation is shown. This cable includes two active plugs **500** and **505**, one on each end of cable **507**. Each active plug includes dual clock and data recovery circuits for retiming data. Specifically, active plug **500** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **520** may be used to configure clock and data recovery circuits **510** and **530** in active plug **500**. Similarly, active plug **505** provides high-speed transmission signals on pins **3** and **5**, and receives high-speed signals on pins **4** and **6**. A cable microcontroller **550** may be used to configure clock and data recovery circuits **540** and **560**. The clock and data recovery circuits may provide and receive signals in a variety of formats. For example, these circuits may include optical receivers and transmitters, such that cable **507** becomes a mix of fiber optic and electrical wires. Cornelius, 6:11-29.

Claim 11	Cornelius
	In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 11	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67. In various embodiments of the present invention, code in the cable microcontrollers **520** and **550** may be changed, reconfigured, upgraded, or updated. This code may be encrypted for security reasons. Also, data provided during a code change, reconfiguration, or update may be encrypted as well. Cornelius, 7:1-6.

Claim 11	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Exhibit B-4

Claim 11	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

L. DEPENDENT CLAIM 12

Claim 12	Cornelius
12[a] The cable manufacturing method of claim 11, wherein the first and second transceivers are each configured to employ cable-dependent equalization parameters for generating the first and second electrical transit signals and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 12	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 12	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 12	**Cornelius**
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
12[b] for clock and data recovery on the second and first electrical transit signals.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 12	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 12	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 12	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

M. DEPENDENT CLAIM 13

Claim 13	Cornelius
13. The cable manufacturing method of claim 12, wherein the first and second transceivers are each configured to adapt the cable-dependent equalization parameters during operation.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 13	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 13	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 13	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.

N. DEPENDENT CLAIM 14

Claim 14	Cornelius
14[a] The cable manufacturing method of claim 12, wherein the first and second transceivers are each configured to use preset cable-dependent equalization parameters during operation, and	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 14	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 14	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 14	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.
14[b] wherein the method further comprises: testing an assembled cable to determine the cable-dependent equalization parameters.	Cornelius discloses and/or renders obvious this limitation. In various embodiments of the present invention, the clock and data recovery circuits may employ equalizer circuits, buffers, emphasis, and de-emphasis circuits as appropriate. Also, loopback paths may be included for diagnostic purposes. For example, the output of CDR **510** may be connected as an input to CDR **530**, while the output of CDR **540** may be an input to CDR **560**. This loopback path allows an HSIO device to determine the location of transmission errors as they arise. This loopback path may also be used in training or calibration routines, as described below. In other embodiments, the cable can self-communicate from end-to-end for diagnostic purposes. Other features that may be included for diagnostics include eye size measurements. In various embodiments of the present invention, the cable may be configured. In this specific embodiment of the present invention, circuitry in cable plug **500** may be configured using cable microcontroller **520**, while circuitry in cable plug **505** may be configured using cable microcontroller **550**. In other embodiments in the present invention, other circuits may be used to configure either or both plugs **500** and **505**. Cornelius, 6:30-49.

Claim 14	Cornelius
	In this specific embodiment of the present invention, operational parameters, modes, and other aspects and characteristics of the plug circuitry may be configured. Information for this configuration may include parameters for control, diagnostics, tests, configuration, circuit monitoring, as well as other parameters. The ability to configure a cable in this way allows cables to adapt to new hosts and devices as the cable is used in various system applications. Information regarding the identification of cable type, vendor, and other identifying information may be available from hosts or devices and cables. Exchange of this information may be used to properly configure and drive circuitry in hosts or devices as well as cables. In this specific embodiment of the present invention, configuration and identification information may be read from and written to the cable using LSx signals on pins **9** and **11**, though in other embodiments of the present invention, other signal pins may be used. Cornelius, 6:50-67.

Claim 14	Cornelius
	In various embodiments of the present invention, the reliability and accuracy of data connections may be improved by calibrating or training circuitry in the hosts, cables, and other devices. This circuitry may include circuits to compensate for cable skew, cross talk (particularly in a connector), channel compensation (such as equalization or cancellation of reflections), and other such circuitry. These circuits may be adjusted using various parameters. In various embodiments of the present invention, parameters for these circuits may be calibrated or otherwise determined by the manufacture and stored as presets for loading during operation. In other embodiments of the present invention, these parameters may be determined while the system is connected. This training or calibration may occur during power up, restart, or other periodical or event-based time. These or other routines may be used to calibrate the path from a host to a near end of the cable, the path through the cable, and the path from the cable to a device or other host. Cornelius, 11:45-62. FIG. **11** illustrates a method of calibrating a cable and related circuitry according to an embodiment of the present invention. In act **1110**, the calibration or training procedure begins. This may be triggered by a power up, cable connection, reset condition, or other periodic or event driven criteria. In act **1120**, a near-end of the cable is placed in loopback mode. A signal is transmitted and received via the loopback path in act **1130**. Transmit and receive parameters for the near-end circuits may be optimized in act **1140**. In act **1150**, the far-end of the cable may be placed in loopback mode. Again, a signal may be transmitted and received via this loopback path in act **1160**. Transmit and receive parameters for the far-end circuits may be optimized in act **1170**. This procedure may be performed by either or both the host and device circuits. Cornelius, 12:6-21.

Claim 14	Cornelius
	To the extent that this preamble is not disclosed, either explicitly or inherently, by Cornelius, this preamble is obvious to a person of ordinary skill in the art based on (1) Cornelius alone, (2) the knowledge of a person of ordinary skill in the art; and/or (3) the teachings with respect to this claim element as detailed in the Cover Pleading and/or other 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.