United States District Court,
N.D. Illinois, Eastern Division.

**TELLABS OPERATIONS, INC,**
Plaintiff.
v.
**FUJITSU LIMITED and Fujitsu Network Communications, Inc,**
Defendants.
**Fjuitsu Limited,**
Counter-Plaintiff.
v.
**Tellabs Operations, Inc., Tellabs, Inc., and Tellabs North America, Inc,**
Counter-Defendants.

**May 13, 2009.**

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***MEMORANDUM OPINION AND ORDER PRELIMINARILY CONSTRUING CERTAIN DISPUTED CLAIM TERMS BASED ON THE INTRINSIC EVIDENCE***

JAMES F. HOLDERMAN**, Chief Judge.**

On June 11, 2008, Tellabs Operations, Inc. filed a complaint against Fujitsu Limited and Fujitsu Network Communications, Inc. (collectively "Fujitsu"), alleging that Fujitsu infringed Tellabs Operations, Inc.'s United States Patent No. 7,369,772 ("the '772 patent"). On April 1, 2009, Fujitsu filed an amended answer and affirmative defenses as well as amended counterclaims alleging that Tellabs Operations, Inc., Tellabs, Inc., and Tellabs North America, Inc. (collectively "Tellabs") infringed two of Fujitsu's patents-United States Patent Nos. 7,227,681 ("the '681patent") and 5,533,006 ("the '006 patent"). The parties requested that this court construe and determine the meaning of over a hundred claim terms used in the contested patents. The court has obliged that request in this opinion, to the extent the evidence intrinsic to the patents and their prosecution histories has allowed. A hearing will be set for the presentation of extrinsic evidence to assist the court in further construing the remaining disputed claim terms, unless the parties can resolve this matter.

***Background***

***1. Tellab's*** '772 Patent

The '772 patent, issued to Tellabs Operations, Inc. on May 6, 2008, is entitled "Optical Line Terminal Arrangement, Apparatus and Methods." The abstract for the '772 patent describes the invention as:

A wavelength division multiplexed optical communication system including a first optical line interface optically coupled to a first transponder and an optical demultiplexer through which the first optical line interface is not optically coupled to the first transponder. The system also includes a second optical line interface and at least one switch. The switch is operable to optically couple the second optical line interface to (a) the first optical line interface through at least the optical demultiplexer, and alternatively (b) the second transponder. A method for an optical add/drop multiplexing system also is provided.

('772 patent, Abstract.) The Field of the Invention section of the '772 patent describes the invention as pertaining to:

upgrading an in-service wavelength division multiplexed (WDM) optical communication system including a pair of optical line terminals (OLTs) that reside in the same office and are part of separate WDM networks to form an all optical pass-through from the line side of one OLT of the pair to the line side of the other OLT of the pair.

('772 patent, col. 1:16-22.)

OLTs allow optical signals to be multiplexed or demultiplexed so that wavelengths may be transmitted using either a peer OLT via a pass-through port or client equipment via a transponder and local port. ('772 patent, col. 2:40-52.) At the time the '772 patent was filed on December 18, 2003, "typical wavelength division multiplexing systems" required all wavelengths "to pass through from a source optical node to a predetermined sink optical node." ('772 patent, col. 1:38-40.) Thus, a need existed to "selectively pass-through, add or drop individual wavelengths at selected optical nodes," and to "utilize the optical line terminals to support complex mesh network structures while permitting growth of an in-service network without disrupting network service." ('772 patent, Summ. of Invention.)

***2. Fujitsu's*** '681 Patent

The '681 patent, issued to Fujitsu Limited on June 5, 2007, is entitled "Controller Which Controls a Variable Optical Attenuator to Control the Power Level of a Wavelength-Multiplexed Optical Signal When the Number of Channels are Varied." The abstract for the '681 patent describes the invention as:

An optical amplifier which amplifies a wavelength division multiplexed (WDM) optical signal having a variable number of channels associated with different wavelengths and outputs the amplified WDM optical signal. The optical amplifier includes (a) an optical attenuator which controls a level of the amplified WDM optical signal, and (b) a controller which controls the WDM optical signal to be amplified with an approximately constant gain.

('681 patent, Abstract.)

The '681 patent explains that fiber optic communication systems use wavelength division multiplexing to transmit multiple wavelength channels through a single optical fiber. ('681 patent, col. 1:33-35.) An optical amplifier or optical repeater "is typically inserted between optical multiplexer and optical demultiplexer to

amplify the wavelength-multiplexed optical signal traveling through optical fiber." ('681 patent, col. 1:66-2:3.) "Such an optical amplifier is typically a rare-earth doped optical fiber amplifier which directly amplifies the wavelength-multiplexed optical signal." ('681 patent, col. 2:3-5.) The use of a rare-earth doped optical fiber amplifier, however, "causes several problems when the number of channels in the wavelength-multiplexed optical signal is varied." ('681 patent, col. 2:10-13.) Specifically, "the optical power of each channel can undesirably be varied, [ ] causing non-linear degradation or S/N degradation of the wavelength-multiplexed optical signal." ('681 patent, col. 2:14-17.) The ' 681 patent addresses the degradation problem by providing "an optical amplifying apparatus which reduces non-linear degradation and S/N degradation of a wavelength-multiplexed optical signal when the number of channels are varied." ('681 patent, col. 2:21-25.)

***3. Fujitsu's*** '006 Patent

The '006 patent, issued to Fujitsu Limited on July 2, 1996, is entitled "Control System for a Ring Type Network System." The abstract for the '006 patent describes the invention as:

A node for a ring type synchronous optical network can continue to communicate with another node, when a transmission path is interrupted, located on the opposite side of the interrupted transmission path. A cross connecting unit cross connects the ring type transmission path with an external transmission path. The cross connecting unit generates and sends to another node an alarm indication signal when the ring type optical path is interrupted. A path switching unit switches the connection of an external transmission path to either direction of the ring type transmission path. A controlling unit controls the path switching unit, when an alarm indication signal is received from another node, so that the path switching unit switches the connection to a side opposite to a side from which the alarm indication signal has been received.

('006 patent, Abstract.)

The '006 patent explains that the controlling unit component of the invention is designed to control path switching on receipt of an interruption alarm indication signal (AI signal) or on receipt of an unused path unequipment code signal (UNEQ signal). ('006 patent, Summ. of Invention.) The prior art control systems did not control path switching on receipt of a UNEQ signal. ('681 patent, col. 2:29-32.) Thus, the invention covered by the '006 patent was developed to provide a system to control path switching when a UNEQ signal is received. ('681 patent, col. 3:28-33.)

## *Legal Standards*

Claim construction "is a matter of law for the court to determine." Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed.Cir.1995) (en banc). While there is no "magic formula" for conducting claim construction and the sequence of steps used in consulting various sources is not important, the court should undertake claim construction from the viewpoint of a person of ordinary skill in the field of invention and determine how that person would understand the claim at the time of the invention. Phillips v. AWH Corp., 415 F.3d 1303, 1313, 1324 (Fed.Cir.2005); *see On* Demand Mach. Corp. v. Ingram Indus., Inc., 442 F.3d 1331, 1337-38 (Fed.Cir.2006). When interpreting the meaning of a claim and the claim terms, the court should first look to intrinsic evidence, *e.g.,* the claims themselves, the specification, the prosecution history, and the prior art cited within the patent, giving the greatest weight to the claim language and the specification. Phillips, 415 F.3d at 1314-18. The court may also look to extrinsic evidence such as expert testimony, treatises, and dictionaries when appropriate, but extrinsic evidence "is less significant than the intrinsic record in determining the legally operative meaning of claim language." Id. at 1315, 1320-21.

When construing a claim, the words of the claim are generally given their ordinary and customary meaning that a person of ordinary skill in the art in question at the effective date of filing would have used. Old Town Canoe Co. v. Confluence Holdings Corp., 448 F.3d 1309, 1315 (Fed.Cir.2006); Phillips, 415 F.3d at 1312-13; Vitronics v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1999). The claim should be read in the context of the entire patent, including the specification, and not just in the context of the particular claim where the disputed term appears because the claims themselves provide substantial guidance in determining the meaning of particular claim terms. Phillips, 415 F.3d at 1313-14. Moreover, there is a heavy, albeit rebuttable, presumption that a claim term carries its ordinary and customary meaning. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366 (Fed.Cir.2002).

A term's ordinary and customary meaning may be rebutted in several ways. For example, where the specification reveals that an inventor ascribed a different meaning to a term than the term's ordinary meaning, the inventor's lexicography governs. Phillips, 415 F.3d at 1316. Similarly, if the specification or prosecution history contain an intentional disclaimer or disavowal of the claim scope, the court may rely on that disclaimer or disavowal as an expression of the inventor's intent. Id. at 1316-17. Generally, however, the court should not limit claims to the preferred embodiments in the specification even though the preferred embodiments can shed light on the intended scope of the claims. Id. at 1323; Astrazeneca AB v. Mut. Pharm. Co., 384 F.3d 1333, 1340 (Fed.Cir.2004). In addition, the court may not apply the ordinary meaning to a claim term where the inventor phrased the claim in means-plus-function format. Allen Eng'g Corp. v. Bartell Ind., Inc., 299 F.3d 1336, 1347-48 (Fed.Cir.2002).

Section 112 of the United States Patent Act provides that claims may be written in means-plus-function format:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. s. 112, para. 6. "The use of the word 'means' triggers a presumption that the inventor used the term advisedly to invoke the statutory mandate for means-plus-function clauses while the absence of the term 'means' triggers a strong presumption that the inventor did not mean to invoke a means plus function construction." Allen Eng'g Corp., 299 F.3d at 1347 (internal quotation marks and citations omitted). Nevertheless, like all claim construction, means-plusfunction language must be construed consistent with the meaning given to the claim term by a person of ordinary skill in the art. Biomedino, LLC v. Waters Tech. Corp., 490 F.3d 946, 950 (Fed.Cir.2007); Atmel Corp. v. Info. Storage Devices, Inc., 198 F.3d 1374, 1380 (Fed.Cir.1999).

In construing a means-plus-function limitation, the court must first determine the claimed function and then identify the corresponding structure in the written description that performs that function. Minks v. Polaris Indus., Inc., 546 F.3d 1364, 1377 (Fed.Cir.2008); Biomedino, LLC, 490 F.3d at 950; JVW Enters., Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1330 (Fed.Cir.2005). The court should not adopt a function different from that explicitly recited in the claim. JVW Enters., Inc., 424 F.3d at 1331. In addition, "to qualify as corresponding, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function." Id. at 1332 (citations omitted). If a patent specification discloses multiple or alternative structures by which a function may be accomplished,

the court is not required to articulate a single claim interpretation that is consonant with all structures in the specification corresponding to the claimed function. Ishida Co. v. Taylor, 221 F.3d 1310, 1316 (Fed.Cir.2000).

## *Analysis*

### **I.** ***Disputed Claim Terms in the*** '772 Patent.

The parties contest a total of 110 individual terms and phrases in the '772 patent that the court has grouped for construction purposes into sixteen categories of terms. The court has construed thirteen of the grouped terms based solely on intrinsic evidence. The remaining three term categories, identified in the conclusion of this memorandum opinion and order, will require the court to receive and consider extrinsic evidence in connection with the ' 772 patent.

The '772 patent claims terms which the court has construed based on the intrinsic evidence are set forth below.

#### *A.* "***Optically Coupled To***"

For the following reasons, the court construes the claim terms "optically coupled to" in claim 1, "is optically coupled to" in claims 3 and 11, and "optically couple ... to" in claims 1, 6, and 7 to mean:

(Component A) can send optical information to (Component B) and/or (Component A) can receive optical information from (Component B).

The court arrived at this definition after considering the parties' respective positions as presented in their materials. As for Tellabs' '772 patent, Fujitsu identified a total of seven terms that use the language "optically coupled to," "is optically coupled to," or "optically couple ... to" and provided an individual construction for each of the seven terms. ( *See generally* Dkt. No. 90, Ex. C.) Fujitsu's proposed seven constructions are all in the form "can send/receive optical information bi-directionally to from." In response, Tellabs argued that:

Several of the terms raised by Fujitsu are of the form 'A optically coupled to B,' 'A is optically coupled to B,' or 'optically couple A to B,' where A and B are different elements. For this reason, Tellabs proposes a single construction that would apply to each of these claim terms with the insertion of the appropriate A and B elements.

(Dkt. No. 91, Ex. C at 2.) The court agrees with Tellabs' proposition that a single construction should apply to all manifestations the "optically coupled to" language because each of the terms operate to establish that two separate components are optically coupled.

Patent '772's specification explains that optical line terminals (OLTs) are designed to send and receive optical signals:

[An] aspect of the invention to utilize optical line terminals having all-optical pass-through interfaces that provide for continued transmission of optical signals ... and to connect two optical line terminals back-to-back ... to provide an optical path from the line side interface of the first optical line terminal to the line side interface of the second line terminal.

('772 patent, col. 1:44-51, 61-2:11.) A single OLT "has an input/output line interface which is connected to an external fiber facility and transmits/receives an optical signal ... on a single optical fiber which is multiplexed/demultiplexed by a multiplexer/demultiplexer [ ] which outputs demultiplexed wavelengths ... on individual optical fibers." ('772 patent, col. 2:40-46.) In this manner, a wavelength can be "directly passed-through to a peer OLT rather than being sent to a client apparatus." ('772 patent, col. 2:18-21; col. 3:18-21.) Accordingly, the intrinsic evidence establishes that optical signals are sent and received between various components of one or more OLT. Therefore, "optically coupled to" requires that optical information can be sent or received between two different components.

***B. "Optical Demultiplexer" and "Optical Multiplexer"***

**1. "Optical Demultiplexer"**

For the following reasons, this court construes the claim term "optical demultiplexer" in claims 1, 4-6, 11-15, 17, 20, and 24 to mean:

A device that receives a plurality of wavelengths multiplexed together as an optical signal and outputs each of the plurality of wavelengths as at least one of the following: (a) individual wavelengths, (b) bands of wavelengths or (c) a combination of bands and individual wavelengths.

The specification for the '772 patents states that:

It is yet another aspect of the invention to utilize optical line terminals having a multiplexer/demultiplexer including one or more stages of inputting/outputting individual wavelengths or bands of a predetermined number of wavelengths, or a combination of bands and individual wavelengths.

('772 patent, col. 1:52-56.) In other words, an OLT can have a demultiplexer, which may have one or more stages for outputting (1) individual wavelengths or (2) bands of a predetermined number of wavelengths or (3) a combination of bands and individual wavelengths.

Figure 3 of the '772 patent specification shows a demultiplexer outputting a combination of bands and individual wavelengths in a two-stage process. ('772 patent, Fig. 3.) In the first stage, optical signals are demultiplexed and bands of wavelengths are output. ('772 patent, col. 4:7-42; *see* Fig. 3.) In the second stage, at least one of the bands is demultiplexed further and output as individual wavelengths. Id. The culmination of the two-stage process is the output of a combination of bands and individual wavelengths. ('772 patent, col. 3:61-4:6; *see* Fig. 3.) Thus, based on examination of the specification an "optical demultiplexer" is a device that receives a plurality of wavelengths multiplexed together as an optical signal and outputs each of the plurality of wavelengths as at least one of the following: (a) individual wavelengths, (b) bands of wavelengths or (c) a combination of bands and individual wavelengths.

**2. "Optical Multiplexer"**

For the following reasons, this court construes the claim term "optical multiplexer" in claims 14 and 15 to mean:

A device that receives a plurality of wavelengths as at least one of the following: (a) individual wavelengths, (b) bands of wavelengths or (c) a combination of bands and individual wavelengths, and outputs a plurality

of wavelengths multiplexed together as an optical signal.

As with a demultiplexer, an OTL can have a multiplexer, which may have one or more stages for inputting (1) individual wavelengths or (2) bands of a predetermined number of wavelengths or (3) a combination of bands and individual wavelengths. Indeed, the specification provides that, "[t]he operation of the OLT is described with respect to the demultiplexing operation; however, it is to be understood that the multiplexing is merely the reverse operation." ('772 patent, col. 4:8-11.) Therefore, given the related nature of the terms "optical multiplexer" and "optical demultiplexer," the appropriate construction of the term "optical multiplexer" is similar to the "optical demultiplexer," with the only difference being that the input and output are reversed.

### *C. "Optical Demultiplexer Through Which the First Optical Line Interface Is Not Optically Coupled To the First Transponder"*

For the following reasons, this court construes the claim term "optical demultiplexer through which the first optical line interface is not optically coupled to the first transponder" in claims 1 and 6 to mean:

The first optical line interface does not send optical information to the first transponder through the optical demultiplexer. Alternatively, the first optical line interface does not receive optical information from the first transponder through the optical demultiplexer.

Both claims 1 and 6 of patent '772 require that the first optical line interface and the first optical transponder are coupled. Claim 1 reads, "a first optical interface optically coupled to a first transponder." Claim 6 reads, "a first transponder optically coupled to the first optical line interface." Applying the definition for "optically coupled to," stated in A, *supra,* claims 1 and 6 become "a first optical line interface sends optical information to a first transponder and/or a first optical line interface receives optical information from a first transponder." With this rephrasing, the ordinary language of the term dictates that the first transponder and the first optical line interface do not send or receive optical information between each other through the optical demultiplexer.

Patent '772's specification supports this interpretation of the term by presenting a clear illustration of the situation contemplated by the language "optical demultiplexer through which the first optical line interface is not optically coupled to the first transponder" at Figure 3. Specifically, Figure 3 shows an optical line interface labeled 202 coupled to a transponder labeled T in the lower right hand corner of the illustration. The optical line interface and the transponder transmit optical information between each other via the following path: from input/output line interface 202 along line 320 to multiplexer/demultiplexer 204, then along line 214 to multiplexer/demultiplexer 216, and finally to transponder T. ( *See* '722 patent, Fig 3.) Figure 3 also shows an optical multiplexer labeled 208 that is not situated along the transmission path that couples the optical line interface and the transponder. ( Id.) The illustration at Figure 3 therefore shows that the first optical line interface does not send optical information to the first transponder through the optical demultiplexer. Alternatively, the first optical line interface does not receive optical information from the first transponder through the optical demultiplexer.

### *D. "Optical Line Interface" and "Bidirectional Optical Line Interface"*

#### 1. "Optical Line Interface"

For the following reasons, this court construes the claim term "optical line interface" in claims 1, 3-8, 11-13,

17, 18, 20, 21, 23, and 24 to mean:

An interface that can carry a plurality of wavelengths multiplexed together as an optical signal.

The parties agree that an optical line interface can send or receive a plurality of wavelengths multiplexed together. Specifically, Fujitsu's proposed construction states, "an interface adapted for carrying wavelength division multiplexed (WDM) optical communication signals of the highest relative order" (Dkt. No. 90, Ex. C at 2), while Tellabs' proposed construction states, "an interface that can carry a plurality of wavelengths multiplexed together as an optical signal" (Dkt. No. 91, Ex. C at 1).

Patent '772's specification also supports the parties' agreed-upon construction. The specification establishes that the invention pertains to a "wavelength division multiplexed (WDM) optical communication system" ('772 patent, col. 1:14-22) and that a "WDM system employs plural optical signal channels, each channel being assigned a particular channel wavelength" ('772 patent, col. 1:28-29). With regard to an OLT, the specification states, "[t]he OLT has an input/output line interface which is connected to an external fiber facility and transmits/receives an optical signal having N optical wavelengths." ('772 patent, col. 2:40-42; *see* Fig. 1.)

The parties, however, dispute the inclusion of the phrase "highest relative order" in the construed meaning of the phrase "optical line interface." Fujitsu's proposed construction requires that the optical signals be of the "highest relative order ." (Dkt. No. 90, Ex. C at 2.) Fujitsu's proposed construction improperly imports a limitation from a preferred embodiment in the specification. *See* Phillips, 415 F.3d at 1323 (explaining that courts generally should not limit patent claims to the preferred embodiments in the specification); Astrazeneca AB, 384 F.3d at 1340 (same). Patent '772's specification only uses the term "highest relative order" once as the specification describes Figure 4, and states that "[t]he line interface is adapted for wavelength division multiplexed (WDM) optical communication signals of the highest relative order." ('772 patent, col. 4:48-50.) To incorporate the requirement that the optical signal be of the 'highest relative order' would limit the claim to a preferred embodiment. The court therefore rejects the incorporation of the limitation "highest relative order" into the construction of "optical line interface."

**2. "Bidirectional Optical Line Interface"**

For the following reasons, this court construes the claim term "bidirectional optical line interface" in claims 14, 15, and 16 to mean:

An interface for sending and receiving a plurality of wavelengths multiplexed together as an optical signal.

In construing the term "bidirectional optical line interface," the court must consider that differences among other claims of the '772 patent can assist in the court's understanding of a term's meaning. *See* Phillips, 415 F.3d at 1314. Accordingly, the term "bidirectional optical line interface" must be construed consistent with the construction of "optical line interface" as explained above. However, the construction of "bidirectional optical line interface" will depart from the construction of "optical line interface" because the addition of the word "bidirectional" necessarily narrows the construction of the term "optical line interface." The word bidirectional requires that the optical line interface send and receive a plurality of wavelengths multiplexed together as an optical signal. Thus, while an "optical line interface" can send or receive a plurality of wavelengths multiplexed together, a "bidirectional optical line interface" must send and receive a plurality of wavelengths multiplexed together as an optical signal.

Tellabs' proposed construction appears to be consistent with this court's construction of "bidirectional optical line interface." (Dkt. No. 91, Ex. C at 2.) But Fujitsu's proposed construction is less clear.

Fujitsu presented two proposals for the meaning of the term "bidirectional optical line interface." For the purpose of independent claim 14, Fujitsu proposed the following construction: "optical line interface can transmit and receive wavelengths over a single optical fiber line to and from an external device." (Dkt. No. 90, Ex. C at 17.) For claim 15, which is dependent on claim 14, Fujitsu proposed: "an interface adapted for carrying bidirectional wavelength division multiplexed (WDM) optical communication signals of the highest relative order." (Dkt. No. 90, Ex. C at 21.) Fujitsu also proposes that claim 16, which is dependent on dependent claim 15, must be construed in the same manner as independent claim 14. (Dkt. No. 90, Ex. C at 22.)

Fujitsu's proposed construction of "bidirectional optical line interface" for claims 14 and 16 uses the conjunctive "and," making the construction of "bidirectional optical line interface" narrower than the construction of "optical line interface." But Fujitsu's proposed construction for claim 15 uses the word "bidirectional," and so the court finds Fujitsu's construction to be unclear. Additionally, Fujitsu's proposed construction for claim 15 contains the words "highest relative order," which as explained above, the court rejects as importing a limitation into the claim from a preferred embodiment.

***E. "Local Port"***

For the following reasons, this court construes the claim term "local port" in claim 1 to mean:

A point of physical interface.

The specification states that a "local port" is the location where the OLT connects to client equipment. Specifically, demultiplexed signals are sent "to client equipment via a transponder and a local port." ('772 patent, col. 2:46-48, col. 2:66-3:1, col. 3:45-50.) Figure 4 illustrates, and the specification explains, that "the local-interface connected to the lines labeled 16 local ports correspond to the local ports connected to the respective transponders, where wavelengths from or to client equipment are added or dropped." ('772 patent, col. 4:57-60; Figs. 1 & 3-8; Sept. 10, 2007 Office Action Resp.) Client equipment includes "SONET equipment, add/drop multiplexers, cross-connect switches, internet protocol (IP) routers, asynchronous transfer mode switches (ATM) and the like." ('772 patent, col. 2:48-52.) Thus, based on examination of the specification a "local port" is a point of physical interface.

***F. "Switch," "Optical Switch," "Nx1 Switch," and "Nx1 Optical Switch"***

**1. "Switch" and "Optical Switch"**

For the following reasons, this court construes the claim term "switch" in patent '772 claims 1 and 15, and "optical switch" in claims 2, 3, 5, 6, 7, 9, 10, 14, 17, 19, 20, 23, and 24 to mean:

A device to receive an optical signal from at least one input and route the optical signal to one of at least two outputs, or to receive an optical signal from one of at least two inputs and route the optical signal to at least one output.

In determining the construction of the terms "switch" and "optical switch," the court must consider whether

differences among other asserted claims can assist the court's understanding of a term's meaning. Phillips, 415 F.3d at 1314. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. Id. at 1314-15.

Intrinsic evidence establishes that the term "switch" in claims 1 and 15 refer to an "optical switch," and therefore both "switch" and "optical switch" should be construed the same. Claim 1 in the patent application issued as claim 1 in the '772 patent. *See* TLIL0001033. (Nov. 29, 2007 Notice of Allowability .) The amendment and response submitted by the patentee, during the prosecution of the '772 patent and which subsequently led to the allowance of claim 1, clearly stated that the switch in claim 1 is an optical switch. Moreover, in overcoming an initial rejection of claim 1, the patentee explained that amended claim 1 is directed toward a system that comprises "an optical switch operable to optically couple the second optical line interface to (a) the first optical line interface through at least the optical demultiplexer, and alternatively (b) the second transponder." TLIL0000998, TLIL0001002. (Sept. 10, 2007 Office Action Resp. at 14, 18.) Thus, the patentee's explanations at each stage of the prosecution process show that "switch" in claim 1 means an "optical switch."

The meaning of the term "switch" in claim 15 is even more straightforward. Claim 15 is dependent on independent claim 14, which refers to an "optical switch." Because claim 14 is antecedent to claim 15 and claim 15 is dependent on claim 14, the "switch" in claim 15 is an "optical switch."

The specification also discusses the operation of various types of optical switches. ( *See* '772 patent, col. 2:60-3:30; Fig. 1 .) Specifically, the operation of the 1x2 switch is described as, "[w]hen in the first position, e1 is provided to a transponder which transmits e1 to a client apparatus via local port. When in the second position e1 is provided to a pass-through port to a corresponding pass-through port in a peer OLT." ('772 patent, col. 2:66-3:3.) Similar descriptions are provided for 2x1 switch, 1xN switch and Nx1 switch. ( *See* '772 patent, col. 2:10-34.) An optical switch therefore can receive an input signal and route the signal to one of multiple outputs, or a switch can receive multiple input signals and route the signals to one output.

**2. "Nx1 Switch" and "Nx1 Optical Switch"**

For the following reasons, this court construes the claim term "Nx1 switch" in claim 19 and "Nx1 optical switch" in claims 2 and 9 to mean:

A device to receive an optical signal from one of N inputs and route the optical signal to one output, or to receive an optical signal from one input and route the optical signal to one of N outputs.

The claim language "Nx1 switch" and "Nx1 optical switch" works to narrow the previously construed term, an "optical switch." For example, in claim 19, the claim states that "the optical switch is an Nx1 switch." ('772 patent, col. 10:22-23.) The term "Nx1 optical switch" is used in claims 2 and 9 in a similar manner: "wherein the optical switch is an Nx1 optical switch." ('772 patent, col. 7:18-19; col. 8:17-18.) Therefore, both an "Nx1 switch" and an "Nx1 optical switch" are optical switches and should be construed in the same manner.

Moreover, the specification explains that an "Nx1 switch" is designed to receive a wavelength from the opposite direction and "provide the wavelength to a multiplexer/demultiplexer to be multiplexed with the other received wavelengths." ('772 patent, col. 3:29-43.) The specification also contains a flow chart of the steps performed by a controller to control various types of optical switches. ('772 patent, col. 3:40-43; *see*

Fig. 2.) In introducing the flow chart, the specification specifically refers to a "1xN switch" and references both a "1xN switch" and an "Nx1 switch," thus equating the two switches. Id. This is understandable because an "Nx1 switch" is simply a "1xN switch" operating in the opposite direction. As the specification explains, a "1xN switch" is "used to send/receive a wavelength to/from one of N-1 peer OLTs or a client apparatus." ('772 patent, col. 3:22-29.) Therefore, an Nx1 optical switch is a device that can receive an optical signal from one of N inputs and route the optical signal to one output, or can receive an optical signal from one input and route the optical signal to one of N outputs.

***G. "At Least One Switch Operable To Optically Couple the Second Optical Line Interface To (a) the First Optical Line Interface Through At Least the Optical Demultiplexer, and Alternatively (b) the Second Transponder"***

For the following reasons, this court construes the claim term "at least one switch operable to optically couple the second optical line interface to (a) the first optical line interface through at least the optical demultiplexer, and alternatively (b) the second transponder" in claim 1 to mean:

At a minimum, one switch can at least both: (a) optically couple the second optical line interface to the first optical line interface through at least the optical demultiplexer; and alternatively (b) optically couple the second optical line interface to the second transponder. FN1

FN1. The term "optically couple" contained within this claim term and throughout the '772 patent should be interpreted consistent with section I.A., *supra,* of this memorandum opinion.

Inclusion of the word "and" in the term "and alternatively," indicates that the switch must be able to optically couple "the second optical line interface" to at least both (a) *and* (b). Inclusion of the word "alternately" indicates that the switch can only couple the "the second optical line interface" to one of at least (a) *or* (b) at any particular time. The switch therefore must be able to optically couple "the second optical line interface" to at least (a) and (b) but can only couple "the second optical line interface" to only one of (a) or (b) at any particular time.

The specification supports this understanding and explains that an OLT contains a switch that allows an individual wavelength to either be passed through to a peer OLT via a pass-through port or to client equipment via a transponder. ('772 patent, col. 3:22-29.) For example, when transmitting a wavelength to or from a peer OLT, the patent '772 specification describes how any two or three WDM systems "may be interconnected by connecting respective OLTs of separate WDM system back-to-back at respective pass-through ports." ('772 patent, col. 5:22-27; *see* col. 5:11-6:51; Figs. 5-8) And when transmitting a wavelength to or from a client apparatus, the specification explains that demultiplexed signals are sent "to client equipment via a transponder and a local port." ('772 patent, col. 2:46-48; col. 2:66-3:1; col. 3:45-50; *see* Fig. 1.)

***H. "Is Optically Coupled To ... Through At Least" and "Optically Couple ... To ... Through At Least"***

For the following reasons, this court construes the '772 patent's claim terms using the language "is optically coupled to ... through at least" in claims 4, 5, 12, and 13 and "optically couple ... to ... through at least" in claims 1 and 6 to mean:

(Component A) can send optical information to (Component B) through at least (Component C). Alternately,

(Component A) can receive optical information from (Component B) through at least (Component C).

Fujitsu identified a total of six terms that use either "is optically coupled to ... through at least" or "optically couple ... to ... through at least." In response, Tellabs argued:

Several of the terms raised by Fujitsu are of the form 'A is optically coupled to B through at least C' or 'optically couple A to B through at least C,' where A, B, and C are different elements. For this reason, Tellabs proposes a single construction that would apply to each of these claim terms with the insertion of the appropriate A, B, and C elements.

(Dkt. No. 91, Ex. C at 3.) The court agrees with Tellabs that a single construction should apply to each claim term using the operative language because both "is optically coupled to ... through at least" and "optically coupled ... to ... through at least" operate to establish that two components are optically coupled through at least a third component.

***I. "Wavelength Division Multiplexed (WDM) Optical Network Environment"***

For the following reasons, this court construes the claim term "wavelength division multiplexed (WDM) optical network environment" in claims 6, 14, 17, and 24 to mean:

An environment having a network for carrying information on a plurality of wavelengths, the plurality of wavelengths multiplexed together as an optical signal.

The specification explains that a WDM network is designed to carry a plurality of wavelengths multiplexed together as an optical signal. First, patent ' 772's specification states, "[t]he invention ... pertains to upgrading an in-service wavelength division multiplexed (WDM) optical communication system." ('772 patent, col. 1:15-18.) The specification then goes on to explain:

A WDM system employs plural optical signal channels, each channel being assigned a particular channel wavelength. In a WDM system optical signal channels are generated, multiplexed to form an optical signal comprised of the individual optical signal channels, transmitted over a single waveguide, and demultiplexed such that each channel wavelength is individually routed to a designated receiver.

('772 patent, col. 1:29-34.)

Fujitsu's proposed construction again includes the phrase "highest relative order" as Fujitsu asserted in its proposed meanings of other disputed terms in patent '772. (Dkt. No. 90, Ex. C at 7.) As the court stated earlier, Fujitsu's proposed construction improperly imports a limitation from a preferred embodiment in the specification. *See* Phillips, 415 F.3d at 1323 (explaining that courts generally should not limit claims to the preferred embodiments in the specification); Astrazeneca AB, 384 F.3d at 1340. The specification only uses the term "highest relative order" once as the specification describes Figure 4 and states that "[t]he line interface is adapted for wavelength division multiplexed (WDM) optical communication signals of the highest relative order." ('772 patent, col. 4:48-50.) To incorporate the requirement that the optical signal be of the 'highest relative order' would limit the claim to a preferred embodiment and, therefore, the court rejects the incorporation of the limitation "highest relative order" into the construction of "optical line interface."

***J. "Electro-Optical Conversion"***

For the following reasons, this court construes the claim term "electro-optical conversion" found in claims 6, 7, 14, and 15 of patent '772 to mean:

The conversion of an electrical signal into an optical signal and/or the conversion of an optical signal into an electrical signal.

The parties presented nearly identical constructions as to the term "electro-optical conversion." Fujitsu proposed that "electro-optical conversion" be construed as "the conversion of an electrical signal into an optical signal, and/or an optical signal into an electrical signal." (Dkt. No. 90, Ex. C at 8-9.) Tellabs proposed: "the conversion of an electrical (optical) signal into an optical (electrical) signal." (Dkt. No. 91, Ex. C at 3.) Both constructions construe electro-optical conversion to be the conversion of an optical signal to an electrical signal, or an electrical signal to an optical signal. Consequently, this claim is not in dispute and needs no further construction by the court.

***K. "Is Operable To Communicate a Wavelength" and "Are Each Operable To Communicate To ... an Individual Wavelength"***

For the following reasons, this court construes the patent '772 claim language "is operable to communicate a wavelength" in claims 6, 7, 14, and 15, and "are each operable to communicate to ... an individual wavelength" in claims 10, 14, and 23 to mean:

Can send a wavelength.

Fujitsu identified eight phrases in patent '772 that contain the language "is operable to communicate a wavelength." All terms containing this language are in two distinct forms: "(the system) is operable to communicate a wavelength from (component A) to (component B)" and "(the system) is operable to communicate a wavelength along (an identified path) from (component A) to (component B)." Fujitsu also identified three phrases that contain the language "are each operable to communicate to ... an individual wavelength." All the terms in patent '772 containing this language are in the form: "(a plurality of Component A) are each operable to communicate to (component B) an individual wavelength." In every instance, the terms operate to establish that a wavelength is communicated from a "component A" to a "component B." The court therefore believes that a single construction should be given for both of these claim terms.

The language of both claim terms describes a device that enables a wavelength to be communicated from a "first component" to a "second component." The language of these phrases also requires that the wavelength to travel in a single direction, *i.e.,* from a "first component" to a "second component." Thus patent '772 claims containing the language "is operable to communicate a wavelength" and "are each operable to communicate to ... an individual wavelength" contemplate a device that can send a wavelength from point A to point B.

***L. "From Which ... Extends To," "Extends To ... From ... And Is Established By At Least" and "Extends From ... To ... And Is Established By At Least"***

For the following reasons, this court determines the patent '772 claim language "from which ... extends to" in claim 14, "extends to ... from ... and is established by at least" in claim 14 and "extends from ... to ... and

is established by at least" in claim 17 do not require construction.

Neither party proposed an overall definition for these highly similar phrases. Instead, both parties provided proposed constructions for a subset term or terms contained within the overall phrase. For example, in claim 17 Fujitsu identified the phrase, "optical path alternatively extends from the first optical line interface to the second optical line interface and is established by at least both the optical switch and an optical demultiplexer through which the first optical path does not extend" as a patent term needing construction by the court. (Dkt. No. 90, Ex. C at 23.) Fujitsu's proposed construction for the identified term then consists of the construction of three previously presented terms: "optical line interface," "the optical switch" and "an optical demultiplexer through which the first optical path does not extend." *Id*. at 23-24. In Tellabs' rebuttal to Fujitsu's proposed construction Tellabs simply construed the three individual terms. (Dkt. No. 91, Ex. B at 2-3; Ex. C at 1.) All subset terms are addressed in the present order except for the term "transponder," which requires extrinsic evidence for proper construction. ( *See* sections I.B.1, I.D, I.F.1, *supra; see* section I.M., *infra*.)

Moreover, the terms "from which ... extends to," "extends to ... from ... and is established by at least" and "extends from ... to ... and is established by at least" do not require construction because the court believes the terms are clear on their own. All the identified terms operate to establish an optical path that extends between various claimed components. Consequently, no further construction by the court is required.

### *M. "Optical Demultiplexer Through Which the First Optical Path Does Not Extend" and "Second Optical Demultiplexer Through Which the First Optical Path Does Not Extend"*

For the following reasons, this court construes the patent '772 claim terms "second optical demultiplexer through which the first optical path does not extend" in claim 14 and "optical demultiplexer through which the first optical path does not extend" in claims 17, 20, and 24 to mean:

The first optical path does not pass through the optical demultiplexer.

In claims 14, 17, 20, and 24, the first optical path is claimed as extending from an optical line interface to a transponder. ('772 patent, col. 8:53-54; col. 9:61-63; col. 10:57-59.)

The support and reasoning for the construction of the terms is then identical to that used in the construction of the term "optical demultiplexer through which the first optical line interface is not optically coupled to the first transponder." ( *See supra* I.C.) Figure 3 shows an optical line interface labeled 202 coupled to a transponder labeled T located in the lower right hand corner of the illustration. The optical line interface and the transponder transmit optical information between each other via the following path: from input/output line interface 202 along line 320 to multiplexer/demultiplexer 204, then along line 214 to multiplexer/demultiplexer 216, and finally to transponder T. ('772 patent, Fig. 3.) Figure 3 also shows an optical multiplexer labeled 208 that is not situated along the defined path that couples the optical line interface and the transponder. ( Id.) Therefore, it is clear that in Tellabs' '772 patent the first optical line interface does not send optical information to the first transponder through the optical demultiplexer.

## **II.** ***Disputed Claim Terms in the*** '681 Patent.

The parties dispute a total of ten individual terms and phrases in the Fujitsu '681 patent. The court has construed five of these ten disputed patent terms based solely on intrinsic evidence. The five remaining terms, identified in the conclusion to this memorandum opinion and order, will require the court to receive

and consider extrinsic evidence.

The court addresses in this section of this memorandum opinion the '681 patent terms that do not require the presentation of extrinsic evidence.

### *A. "A Transmitting Terminal"*

For the following reasons, this court construes the claim term "a transmitting terminal" in claims 1 and 9 to mean:

One or more devices that transmit a WDM optical signal.

The term "a transmitting terminal" is in claims 1 and 9 in the following context: "a transmitting terminal transmitting a wavelength division multiplexed (WDM) optical signal having a variable number of channels associated with different wavelengths." ('681 patent, col. 22:5-8; col. 22:54-57.)

Within the '681 patent's specification, transmitters are represented both as a single device and as a combination of devices. Specifically, Figure 25 illustrates "a transmitter (Tx) transmits a SV light beam to a receiver (Rx), were an SV light beam is light that is wavelength-multiplexed with a main signal." ('681 patent, col. 19:40-44.) So, a transmitting terminal, as represented by the transmitter Tx, can be a single device. Figure 1 of the ' 681 patent, however, depicts:

a conventional fiber optic communication system which uses wavelength division multiplexing to transmit, for example, four channels through a single optical fiber. Referring now to FIG. 1, transmitting units transmit individual carriers having wavelengths (lambda)1-(lambda)4, respectively. Each carrier is modulated with information and represents an individual channel. The different carriers are multiplexed together by an optical multiplexer into a wavelength-multiplexed optical signal. The wavelength-multiplexed optical signal is transmitted through an optical fiber to an optical demulitplexer.

('681 patent, col. 1:44-55; *see* Fig. 1.) Moreover, the conventional fiber optic communication system of Figure 1 explains that "[a]n optical amplifier (not illustrated) or an-optical repeater (not illustrated) is typically inserted between optical multiplexer and optical demultiplexer, to amplify the wavelength-multiplexed optical signal traveling through optical fiber." ('681 patent, col. 1:66-2:3.) Thus, the transmitting terminal that transmits a WDM optical signal in Figure 1 can be more than one device that include the transmitting units and the multiplexer.

### *B. "Approximately Constant"*

For the following reasons, this court construes the claim term "approximately constant" in claims 1, 6, 9, and 14 of the '681 patent to mean:

Nearly constant or constant.

The term "approximately constant" occurs in context as: "a controller which controls the gain to be approximately constant." ('681 patent, col. 22:17-18; col. 22:45-46; col. 22:66-67; col. 24:14-15.) The language "approximately constant" therefore refers to the resulting effect of the controller on the gain.

The term "approximately constant" should be given its plain and ordinary meaning. An examination of the

specification reveals that the various embodiments within the specification describe the device that controls the gain as an automatic optical gain control circuit ("AGC"). ( *See, e.g.*, '681 patent, col. 6:6-14; col. 10:19-38). One embodiment of the specification that describes an automatic optical gain control circuit and is representative of the entire specification states:

[O]ptical gain control circuit controls pump laser diode so as to maintain, at a constant level, the ratio between the level of the input wavelength-multiplexed optical signal ... and the level of the amplified wavelength-multiplexed optical signal .... In this manner, first part conserves the wavelength dependence by controlling the optical gain at a constant level.

('681 patent, col. 6:6-14.) Specifically, Figure 5 provides an illustration of an automatic gain control circuit "for controlling an optical gain to be at a constant level." ('681 patent, col. 10:19-38; *see* Fig. 5.) All descriptions of an AGC dictate that the circuit works to keep the gain constant, and there is nothing in the specification indicating a special meaning of "constant" beyond the plain and ordinary meaning of the word.

In addition, nothing in the '681 patent's specification dictates that a special meaning is attributed to the word "approximately." Therefore, "approximately" must be given its plain and ordinary meaning. Consequently, "approximately constant" is construed as nearly constant or constant.

***C. "A Receiving Terminal"***

For the following reasons, this court construes the claim term "a receiving terminal" in claim 9 to mean:

One or more devices that receive a WDM optical signal.

The court employed similar reasoning in construing "a receiving terminal" as it did in construing "a transmitting terminal." ( *See* section II.A, supra.) The term "a receiving terminal" occurs in context as "a receiving terminal receiving the amplified WDM optical signal from the optical amplifier." ('681 patent, col. 23:1-2.)

Within the specification, receivers are represented as both a single device and as a combination of devices. Specifically, Figure 25 illustrations "a transmitter (Tx) transmits a SV light beam to a receiver (Rx), were an SV light beam is light that is wavelength-multiplexed with a main signal." ('681 patent, col. 19:40-44.) So, a receiving terminal, as represented by receiver Rx, can be a single device. Figure 1 of the '681 patent, however, depicts:

The wavelength-multiplexed optical signal is transmitted through an optical fiber to an optical demulitplexer. Optical demultiplexer branches the wavelength-multiplexed optical signal into four separate optical signals having the wavelengths (lambda)1-(lambda)4, respectively. The four separate branched optical signals are then detected by receiving units, respectively.

('681 patent, col. 1:53-59; *see* Fig. 1.) Thus, the receiving terminal that receives a WDM optical signal in Figure 1 of the '681 patent can be more than one device that includes the receiving units and the demultiplexer.

***D. "A Variable Number of Channels Associated With Diferent Wavelengths"***

For the following reasons, the court construes the claim term "a variable number of channels associated with

different wavelengths" in claims 1, 6, 9, and 14 to mean:

The number of channels can change and each channel is associated with a different wavelength.

The construction of "a variable number of channels associated with different wavelengths" is undisputed. The parties presented nearly identical constructions of the term, which shows that the parties have ascribed the same meaning to the term. Any difference in the parties' proposed constructions is immaterial.

***E. "During Variation of the Number of Channels in the WDM Optical Signal"***

For the following reasons, the court construes the term "during variation of the number of channels in the WDM optical signal" in claims 2, 7, 10, and 15 to mean:

While the number of channels in the WDM optical signal changes.

Fujitsu first presented this term for construction as, "during the process of changing the number of optical channels in the WDM optical signal." (Dkt. No. 90, Ex. B at 1.) Fujitsu then proposed the following clarifying construction: "During the process of changing the number of optical channels in the WDM optical signal (including before the variation in the number of channels is complete)." (Dkt. No. 92, Ex. B at 1.) Tellabs construed the term in its rebuttal as, "while the number of channels changes." (Dkt. No. 91, Ex. A.)

A review of the specification reveals that each channel is associated with a different wavelength and that the number of channels can change. ('681 patent, col. 2:10-13.) Several problems, however, arise when the number of channels is changed. The specification refers to the time when the number of channels changes as, "during the variation (that is, before the variation in the number of channels is complete)." ('681 patent, col. 2:13-17.) Thus, during variation, which includes the time before the variation in the number of channels is complete, simply means, "while the number of channels in the WDM optical signal changes."

**III. *The Disputed Claim Terms in the*** '006 Patent.

The parties contest a total of twelve individual terms and phrases in the ' 681 patent that the court has grouped into ten terms for construction. Nine of the grouped terms are written in means-plus-function form. Of the nine grouped means-plus-function terms, the court can construe only one complete term based solely on intrinsic evidence. Of the remaining eight means-plus-function terms, the court is able to identify the corresponding function of each term based on intrinsic evidence, but extrinsic evidence will be required to determine the terms' corresponding structure.

***A. "A Ring Type Network"***

For the flowing reasons, the court construes the claim term "a ring type network" in claims 1, 5, 6, and 11 in the '006 patent to mean:

A network in which a plurality of nodes are coupled in a ring network.

The term "a ring type network" occurs in claims 1 and 5 as, "a node provided in a ring type network having a plurality of nodes coupled to each other via ring type transmission path means" and in claims 6 and 11 as, "a control system for a ring type network."

The invention at issue in the '006 patent relates to a ring type network system. The specification explains the preferred "embodiment is directed to a ring type synchronous optical network" ('006 patent, col. 6:31-32) and that a "synchronous optical network (SONET) in which a plurality of nodes are connected via a ring type transmission path is known in the art" ('006 patent, col. 1:13-15). In addition, the invention is not limited to an optical network because, the specification explains, "the present invention may be applied to a ring type network using an electric signal transmission path." ('006 patent, col. 6:32-34.)

Tellabs' proposed construction defines "a ring type network" as "a network forming a pathway for signals in which each node connects to exactly two other nodes." (Dkt. No. 89, Ex. A at 1.) Fujitsu contends that Tellabs' construction is unreasonably limiting because no support exists for limiting the term "network" to a network that connects to "exactly two other nodes." (Dkt. No. 92, Ex. A at 1.) The court agrees with Fujitsu. The Figures included in the patent illustrate two transmission paths connecting any given node to two other nodes and two additional paths labeled "R" and "S." The specification explains that "reception path R" and "transmission path S" also allow signals to be received and transmitted at the connected node. ('006 patent, col. 1:31-45.) Although paths "R" and "S" are not shown connected to another node, nothing in the specification suggests that they could not connect to another node. In fact, an examination of the prior art reveals that a node in a loop may be connected to more than two other nodes. ( *See* U.S. Patent 5,159,595, Fig. 12 (showing a cross connect node in a network of intersecting loops).) Thus, Tellabs' construction would unreasonably limit the term "a ring type network."

***B. "Ring Type Transmission Path Means"*** FN2

FN2. Each of the limitations discussed in this section are means-plus-function limitations because they use the words "means," invoking the statutory presumption for means-plus-function clauses. Allen Eng'g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1347 (Fed.Cir.2002). Neither Tellabs or Fujitsu disputed that terms using the word "means" are a means-plus-function element and both parties construed all such terms according to 35 U.S.C. s. 112, para. 6. ( *See* Dkt. No. 89, Ex. A at 1-8; Dkt. No. 91, Ex. A; Dkt. No. 115 at 2-4.)

For the following reasons, the term "ring type transmission path means" is construed by the court to mean:

A plurality of data transmission paths capable of carrying either electrical or optical signals and their equivalents.

Based on the claim language and an examination of the specification, the function performed by the "ring type transmission path means" is to receive and transmit multiplexed signals in mutually opposite directions between nodes. Both Tellabs and Fujitsu identified this function for the "ring type transmission path means." (Dkt. No. 92, Ex. A at 1-2; Dkt. No. 115 at 2.) The function for this term, therefore, is undisputed.

In determining the corresponding structure for this function, the court looked to three portions of the specification. First, the specification shows that the prior art contains an "optical transmission line comprising a plurality of optical paths in each direction." ('006 patent, col. 1:32-33.) Second, the preferred embodiment reveals "a ring type optical transmission line comprising a plurality of optical paths. Multiplexed optical signals can be bidirectionally transmitted through the ring type optical transmission line." ('006 patent, col. 3:61-64.) Third, the present invention does not limit the transmission path to optical signals but explains that "the present invention may be applied to a ring type network using an electric

signal transmission path." ('006 patent, col. 6:32-43.) Thus, the corresponding structure in the specification for the function that receives and transmits multiplexed signals in mutually opposite directions between nodes is a plurality of data transmission paths capable of carrying either electrical or optical signals and their equivalents.

***C. "Cross Connecting Means"***

The court cannot fully construe the term "cross connecting means" at this time. The court, however, can determine its function.

Based on the claim language and an examination of the specification, the function performed by the "cross connecting means" is to cross connect the paths of the ring type transmission path means by dropping signals in time slots of the node and passing through signals in time slots of other nodes of the network. Both Tellabs and Fujitsu identified this function for the "cross connecting means." (Dkt. No. 92, Ex. A at 3; Dkt. No. 115 at 2.) The function for this term, therefore, is undisputed.

The court is unable to determine the structure of the "cross-connecting means" at this time based solely on intrinsic evidence.

***D. "Path Switching Means"***

The court cannot fully construe the term "path switching means" at this time. The court, however, can determine its function.

Although the parties provided slightly different constructions for the function of this term, based on the claim language and an examination of the specification, the function performed by the "path switching means" is to switch only signal receiving paths of the ring type transmission path means to connect the node to one of two signal receiving paths from which said node is to receive a signal, with said two signal receiving paths transmitting signals in two mutually opposite directions.

The court is unable to determine the structure of the "path switching means" at this time based solely on intrinsic evidence.

***E. "Controlling Means"***

The court cannot fully construe the term "controlling means" at this time. The court, however, can determine its function.

Although the parties provided slightly different constructions for the function of this term, based on the claim language and an examination of the specification, the function performed by the "controlling means" is to control the switching operation of the path switching means to connect the node to one of the two signal receiving paths in response to at least one unequipment code signal received via another of said two signal receiving paths from an arbitrary node coupled to said node and indicating an unused path which is not cross-connected in said arbitrary node.

The court is unable to determine the structure of the "controlling means" at this time based solely on intrinsic evidence.

***F. "Said Controlling Means Also"***

The court cannot fully construe the term "said controlling means also" at this time. The court, however, can determine its function.

Although the parties provided slightly different constructions for the function of this term, based on the claim language and an examination of the specification, the function performed by "said controlling means" is to control the switching of the path switching means to connect the node to one of the two signal receiving paths in response to an alarm indication signal received via said another of said two signal receiving paths from another arbitrary node coupled to said node and indicating a connection failure between said node and said arbitrary node coupled to said node.

The court is unable to determine the structure of the "said controlling means also" at this time based solely on intrinsic evidence.

***G. "Said Controlling Means Determines"***

The court cannot fully construe the term "said controlling means determines" at this time. The court, however, can determine its function.

Based on the claim language and an examination of the specification, the function performed by the "controlling means" is to determine an unused path of a node and inhibit switching of the path switching means when an unequipment code signal is received with respect to an unused path of the node. Both Tellabs and Fujitsu identified this identical function. (Dkt. No. 92, Ex. A at 9-11; Dkt. No. 115 at 3.) The function for this term, therefore, is undisputed.

The court is unable to determine the structure of the "said controlling means determines" at this time based solely on intrinsic evidence.

***H. "A First Alarm Indication Signal Detecting Means" and "A Second Alarm Indication Signal Detecting Means"***

The court cannot fully construe the terms "a first alarm indication signal detecting means" and "a second alarm indication signal detecting means" at this time. The court, however, can determine their function.

Based on the claim language and an examination of the specification, the function for "a first alarm indication signal detecting means" is to detect a first alarm indication signal received from a first signal receiving path of two signal receiving paths and outputting a first detection result signal. The function for "a second alarm indication signal detecting means" is to detect a second alarm indication signal received from a second signal receiving path of two signal receiving paths and outputting a third detection result signal. Both Tellabs and Fujitsu identified these functions for the terms "a first alarm indication signal detecting means" and "a second alarm indication signal detecting means." (Dkt. No. 92, Ex. A at 11-14; Dkt. No. 115 at 3.) The functions for the terms, therefore, are undisputed.

The court is unable to determine the structure of "a first alarm indication signal detecting means" and "a second alarm indication signal detecting means" at this time based solely on intrinsic evidence but believes that both terms likely will have the same structure because both terms function to detect an alarm indication signal and output a detection result signal.

### *I. "A First Unequipment Code Signal Detecting Means" and "A Second Unequipment Code Signal Detecting Means"*

The court cannot fully construe the terms "a first unequipment code signal detecting means" and "a second unequipment code signal detecting means" at this time. The court, however, can determine their function.

Based on the claim language and an examination of the specification, the function performed by "a first unequipment code signal detecting means" is to detect a first unequipment code signal received from a first signal receiving path and outputting a second detection result signal. The function performed by "a second unequipment code signal detecting means" is to detect a second unequipment code signal received from a second signal receiving path and outputting a fourth detection result signal. Both Tellabs and Fujitsu identified these functions for the terms "a first unequipment code signal detecting means" and "a second unequipment code signal detecting means." (Dkt. No. 92, Ex. A at 12-15; Dkt. No. 115 at 3.) The functions for the terms, therefore, are undisputed.

The court is unable to determine the structure for "a first unequipment code signal detecting means" or "a second unequipment code signal detecting means" at this time based solely on intrinsic evidence but believes that both terms will have the same structure because both terms function to detect an unequipment code signal and output a detection result signal.

### *J. "A Determining Means"*

The court cannot fully construe the term "a determining means" at this time. The court, however, can determine its function.

Based on the claim language and an examination of the specification, the function of "a determining means" is to compare the first and third detection result signals received from the first and second alarm indication signal detecting means and the second and fourth detection result signals received from the first and second unequipment code signal detecting means, respectively, and to control the switching of the path switching means based on the comparison. Both Tellabs and Fujitsu identified this function for "a determining means." (Dkt. No. 92, Ex. A at 15-17; Dkt. No. 115 at 3-4.) The function for this term, therefore, is undisputed.

The court is unable to determine the structure of "a determining means" at this time based solely on intrinsic evidence.

## *Conclusion*

Based on the reasoning set forth above, the court has fully construed the majority of the disputed claims in the '772 patent, the '681 patent, and the '006 patent, but the court was unable to construe all of the disputed claim terms. Construction of the remaining disputed claim terms will necessitate consideration of extrinsic evidence. The terms requiring extrinsic evidence for the '772 patent are: "transponder," "reside in the same office," and "modular card." The terms requiring extrinsic evidence for the ' 681 patent are: "gain," "optical attenuator," "controls a level of the amplified WDM optical signal," "controls a level of the first stage amplified WDM optical signal," "substantially even," and "substantially flat." As to the '006 patent, the court will require extrinsic evidence concerning the structure corresponding to the identified function for the terms: "cross connecting means," "path switching means," "controlling means," "said controlling means also

controls," "said controlling means determines," "a first alarm indication signal detecting means," "a second alarm indication signal detecting means," "a first unequipment code signal detecting means," "a second unequipment code signal detecting means," and "a determining means."

Case set for status on June 2, 2009 at 9:00 a.m. to set a further schedule.

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