United States District Court,
N.D. California.

**PCTEL, INC,**
Plaintiff.
v.
**AGERE SYSTEMS, INC,**
et al. Defendants.

No. C 03-2474 MJJ

**Sept. 8, 2005.**

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## CLAIM CONSTRUCTION ORDER

JENKINS**, J.**

## INTRODUCTION

Before the Court are the parties' proposed constructions of disputed terms contained in three of PCTEL, Inc.'s ("PCTEL") patents. The patents-in-suit describe and claim technology used in modems.

## FACTUAL BACKGROUND

This case concerns the alleged infringement of U.S. Patent Number 4,841,561 (the " '561" patent) entitled "Operating Default Group Selectable Data Communication Equipment," U.S. Patent Number 5,931,950 (the " '950" patent) entitled "Wake-Up-On-Ring Power conservation for Host Signal Processing Communication System," and U.S. Patent Number 6,493,780 (the " '780" patent) entitled "Wake-Up-On-Ring Power Conservation for Host Signal Processing Communication System." PCTEL alleges that Agere Systems, Inc. and Lucent Technologies, Inc. (collectively "Agere"), have infringed each of the three patents. PCTEL also alleges that U.S. Robotics Corporation ("USR") infringed the '561 patent. The issue before the Court is the construction of disputed terms contained in the patents.

A modem allows one or more electronic devices to communicate over telephone lines. Electronic devices that employ modems include personal computers, notebook computers and specialized computers such as ATM machines and cable TV set-top boxes. Modems are used to transmit computer signals over telephone

lines because telephone lines are designed for analog signals, not digital signals. Modems receive digital signals from a computer and "modulate" the computer signals so that the signals have electrical characteristics suitable for transport over the telephone network as analog signals. In the other direction, modems receive analog signals from a telephone line and "demodulate" analog signals into digital signals that a computer understands. Modem is a contraction of "modulation" and "demodulation."

***A.*** '561 patent

The '561 patent claims a multi-country modem feature so that a single modem can be used in multiple countries. In the mid-1980's, different countries had different requirement for connecting to and communicating over their telephone lines. For example, some of the parameters that varied by country were: 1) the make/break ratio; 2) guard tone; 3) line impedance; and 4) transmit line signal level. The '561 patent included the parameters for desired countries and when a desired country is selected, the patented feature loads the proper parameters, properly configuring the modem for the selected country.

Thus, the '561 patent permits portable computer users to use their modem in foreign countries. This multi-country support also allows desktop, server and specialized computer manufactures to sell throughout the world a computer with a modem, which may be sold and used in different countries.

***B. '950 and*** '780 patents

The '950 and '780 patents describe and claim a host signal processing ("HSP") modem that permits a host computer to enter a power savings state, while retaining the ability for the HSP modem to receive an incoming telephone or modem call.

As computers became faster and more powerful, they consumed correspondingly greater amounts of electricity. Computer manufactures developed techniques for reducing the power consumption of their products. To overcome this problem, the inventor of the '950 and '780 patents invented a modem that allows a power management system to place a computer in power-saving mode when there is no active connection, yet still allows the modem to respond to incoming calls. Thus, in sum, with the use of the claimed invention of the '950 and '780 patents, the host computer is capable of entering a sleep mode, and unlike prior HSP modem systems, still handle incoming calls.

## LEGAL STANDARD

The construction of a patent claim is a matter of law for the Court. Markman v. Westview Instruments, Inc., 517 U.S. 370, 372, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The Court must conduct an independent analysis of the disputed claim terms. It is insufficient for the Court to simply choose between the constructions proposed by the adversarial parties. Exxon Chem. Patents v. Lubrizol Corp., 64 F.3d 1553, 1555 (Fed.Cir.1995). To determine the meaning of a patent claim, the Court considers three sources: the claims, the specification, and the prosecution history. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed.Cir.1995) ( *en banc* ), *aff'd,* Markman, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577.

The Court looks first to the words of the claims. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). "Although words in a claim are generally given their ordinary and customary meaning, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history." *Id*. (citation omitted). "A technical term used in a patent document is interpreted as having the

meaning that it would be given by persons experienced in the field of the invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning." Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed.Cir.1996). The doctrine of claim differentiation creates the presumption that limitations stated in dependent claims are not to be read into the independent claim from which they depend because different language used in separate claims is presumed to indicate that the claims have different meanings and scope. Tandon Corp. v. U.S. International Trade Com., 831 F.2d 1017, 1023 (Fed.Cir.1987).

Second, it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. Vitronics, 90 F.3d at 1582. The specification can act as a dictionary when it expressly or impliedly defines terms used in the claims. *Id*. Because the specification must contain a description of the invention that is clear and complete enough to enable those of ordinary skill in the art to make and use it, the specification is the single best guide to the meaning of a disputed term. *Id*. The written description part of the specification itself does not delimit the right to exclude, however; that is the function and purpose of claims. Markman, 52 F.3d at 980.

Third, the court may consider the prosecution history. Vitronics, 90 F.3d at 1582. "Although the prosecution history can and should be used to understand the language used in the claims, it too cannot enlarge, diminish, or vary the limitations in the claims." Markman, 52 F.3d at 980 (internal quotation marks deleted) (citations omitted). However, a concession made or position taken to establish patentability in view of prior art on which the examiner has relied, is a substantive position on the technology for which a patent is sought, and will generally generate an estoppel. In contrast, when claim changes or arguments are made in order to more particularly point out the applicant's invention, the purpose is to impart precision, not to overcome prior art. Such prosecution is not presumed to raise an estoppel, but is reviewed on its facts, with the guidance of precedent. Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1220 (Fed.Cir.1995) (citations omitted).

Ordinarily, the Court should not rely on expert testimony to assist in claim construction, because the public is entitled to rely on the public record of the patentee's claim (as contained in the patent claim, the specification, and the prosecution history) to ascertain the scope of the claimed invention. Vitronics, 90 F.3d at 1583. "[W]here the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper." *Id*. Extrinsic evidence should be used only if needed to assist in determining the meaning or scope of technical terms in the claims, and may not be used to vary or contradict the terms of the claims. *Id*. (quoting Pall Corp., 66 F.3d at 1216); Markman, 52 F.3d at 981.

The Court "is free to consult technical treatises and dictionaries at any time, however, in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents." Vitronics, 90 F.3d at 1584 n. 6. The Court also has the discretion to admit and rely upon prior art proffered by one of the parties, whether or not cited in the specification or the file history, but only when the meaning of the disputed terms cannot be ascertained from a careful reading of the public record. Id. at 1584. Referring to prior art may make it unnecessary to rely on expert testimony, because prior art may be indicative of what all those skilled in the art generally believe a certain term means. *Id*. Unlike expert testimony, these sources are accessible to the public prior to litigation to aid in determining the scope of an invention. *Id*.

Disputed claim terms are construed consistently across all claims within a patent. Southwall Techs., Inc. V.

Cardinal IG Co., 54 F.3d 1570, 1579 (Fed.Cir.1995). Where patents-in-suit share the same disclosures, common terms are construed consistently across all claims in both patents. Mycogen Plant Sci., Inc. v. Monsanto Co., 252 F.3d 1306, 1311 (Fed.Cir.2001) ( *overruled on other grounds* ).

"The subjective intent of the inventor when he used a particular term is of little or no probative weight in determining the scope of a claim (except as documented in the prosecution history)." *Markman,* 50 F.3d at 985 (citation omitted). "Rather the focus is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean." *Id*. at 986.

## DISPUTED CLAIM TERMS

The following is a list of eleven terms identified by the parties in the March 16, 2005 Revised Joint Claim Construction and Prehearing Statement:

1) memory means

2) hardware related [operating] parameter

3) changing a[the] hardware configuration

4) means for changing a[the] hardware configuration

5) to assume a proper configuration

6) host signal processing [communication system/modem]

7) host processor

8) periodically asserts a first signal while operating in a first mode

9) as the interrupt signal

10) periodic interrupts

11) selection logic

## ANALYSIS

**I.** The '561 Patent

### A. *memory means* (Claims 1, 2, 5, 10)

A "means-plus-function" claim is a special type of claim provided for in 35 U.S.C. s. 112, paragraph 6, which provides:

An element in a claim for a combination may be expressed as a means or a 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. Under this provision, an inventor can describe an element of the invention by the result accomplished or the function served, rather than by describing the item or element to be used. Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co. ., 520 U.S. 17, 27, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). When using means-plus-function language, "[t]he applicant must describe in the patent specification some structure which performs the specified function." Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1042 (Fed.Cir.1993). A structure disclosed in the specification is only deemed to be "the corresponding structure" if the specification clearly links or associates that structure to the function recited in the claim. Kahn v. General Motors Corp., 135 F.3d 1472, 1476 (Fed.Cir.1998). The duty to link or associate structure in the specification with the function is the quid pro quo for the convenience of employing the means-plus-function format. *Id*.

An accused device with a structure that is not identical to the structure described in the patent will literally infringe the patent if the accused device performs the identical function required by the means-plus-function claim with a structure identical or equivalent to that described in the patent. Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1457 (Fed.Cir.1998) (en banc); Kahn, 135 F.3d at 1476. "Thus, the statutory provision prevents an overly broad construction by requiring reference to the specification, and at the same time precludes an overly narrow construction that would restrict coverage solely to those means *expressly* disclosed in the specification." Symbol Technologies, Inc. v. Opticon, Inc., 935 F.2d 1569, 1575 (Fed.Cir.1991) (citations omitted).

The parties disagree whether "memory means" is governed by 35 U .S.C. s. 112 para. 6. PCTEL contends that this claim is not governed by s. 112, para. 6. FN1 However, if the claim is subject to s. 112, para. 6, PCTEL contends that the corresponding structure is "memory and equivalents thereof." Agere contends that this claim is a means-plus-function limitation that is governed by s. 112, para. 6. Agere asserts that the corresponding structure is "external memory ROM/RAM 50 of modem 10." USR contends that this claim is governed by s. 112, para. 6, and that the corresponding structure is "a memory and equivalents thereof."

FN1. Interestingly, PCTEL accepted that "memory means" was a means-plus-function term in the ITC investigation.

PCTEL relies upon Envirco Corp. v. Clestra Cleanroom, Inc., 209 F.3d 1360 (Fed.Cir.2000), to support its proposition that the term is not governed by s. 112, para. 6.FN2 In *Envirco,* the Federal Circuit held that the word "baffle" alone constituted sufficient structure, and trumped the use of the word "means." *Id*. at 1364-65. "Because the term "baffle" itself imparts structure, meaning a surface which deflects air, its use in the claims rebuts the presumption that s. 112, para. 6 applies." *Id*. at 1365.

FN2. Despite PCTEL's assertions to the contrary, the Court does not consider Dr. Wicker's Declaration because it is extrinsic evidence. *See* Vitronics, 90 F.3d at 1583.

PCTEL also relies upon Katz v. AT & T Corp., 63 F.Supp.2d 583, 640 (E.D.Pa.1999), where the court held that "memory means" is not subject to analysis under s. 112 para. 6 because the word "memory" connotes

sufficient structure to rebut the presumption that the term is written in means-plus-function format. The *Katz* court construed "the term 'memory' according to its plain meaning as: computer hardware that stores information, such as disks, RAM, or tapes." *Id*. at 602 n. 14.

Agere and USR assert that this claim limitation is a means-plus-function limitation, and rely upon Genlyte Thomas Group LLC v. Lutron Elecs. Co., Inc., 2004 WL 690847, *11-13 (N.D.Tex. March 31, 2004). In *Lutron,* the court concluded that " 'memory means' is means plus function language, and the Court must determine the structure described in the specification for carrying out the function of storing information...." *Id*. at *11. Other courts have agreed with this conclusion. *See* British Telecomm. PLC v. Prodigy Comm. Corp., 189 F.Supp.2d 101, 127-31 (S.D.N.Y.2002); Lucent Techs., Inc. v. Newbridge Networks Corp., 168 F.Supp.2d 181, 202 (D.Del.2001).

As in *Lutron* and *Lucent,* the Court finds that PCTEL has not overcome the presumption that "memory means" is a means-plus-function limitation. The function of this element is to store values for storing operating parameters. The structure associated with this element is memory associated with "External Memory ROM/RAM 50."

However, the parties' disagree regarding the precise scope of the structures to be included in the claim. PCTEL and USR assert that the structure of "memory means" is "memory and equivalents thereof." PCTEL contends that the '561 patent discloses a discrete class of structures that perform the claimed function and admits that a specific, preferred type of memory is disclosed in embodiment of the patant (i.e., ROM and RAM). PCTEL argues that it should not be penalized for having disclosed a preferred type of memory by having the scope of the claims narrowed so as to only cover a certain type of memory. Along the same lines, PCTEL asserts thatthe location of its memory should not be limited to only "external" memory.

Agere responds that the only disclosed embodiment of the invention of the '561 patent expressly discloses that the structure corresponding to the "memory means" is "External Memory ROM/RAM 50 of modem 10." Agere also notes that Fig. 1 of the '561 patent discloses that External Memory ROM/RAM 50 of modem 10 is separate and "external" to the data terminal equipment, which can contain a separate ROM and/or RAM of its own.

At this stage of the litigation, the Court need only identify all corresponding structures disclosed in the specification of the '561 patent. "[T]he scope of such a claim is not limitless, but is confined to structures expressly disclosed in the specification and corresponding equivalents." Symbol Technologies, 935 F.2d at 1575. The Court notes that the specification reveals "memory means" such as "RAM," "ROM," "EPROM," and "EEPROM." Therefore, the Court finds that the structure corresponding to "memory means" is *memory 50,* including "RAM," "ROM," "EPROM," or "EEPROM." The Court declines to limit the location of the memory to only "external memory."

**B. *Hardware Related [Operating] Parameter* (Claims 1 and 11)**

PCTEL states that the term has a plain and understood meaning, and no construction of the term is necessary. Alternatively, PCTEL contends that the term should be construed as "characteristics relating to electrical/physical properties of circuitry." To support its alternative construction, PCTEL relies solely on its expert witness Dr. Wicker.

Agere and USR contend that this term is not amenable to construction, and thus is invalid as indefinite

under 35 U.S.C. s. 112, para. 2. Alternatively, Agere and USR propose that the term should be construed as "an operating parameter that when changed requires a change in hardware configuration and not simply a change in the use of the hardware provided."

To support their alternative construction, Agere and USR rely upon the patent's claim language and the prosecution history. Agere and USR rely upon independent claim 1 that recites the element of a "means for changing a hardware configuration of said data communication apparatus in accord with said at least one hardware related parameter value." '561 patent, col. 11:36-39. Additionally, independent claim 10 recites the element of "using said at least one hardware related operating parameter to cause said means for changing the hardware configuration to change the hardware configuration of said modem .... " '561 patent, col. 13:20-25. Agere and USR assert that these limitations make clear that "hardware related operating parameters" cause changes in the "hardware configuration" of the modem.

Regarding the prosecution history, Agere and USR note that the PTO rejected the claims of the '195 patent as originally submitted as unpatentable over existing art on "multi-country" communication devices. In particular, the PTO found that it would have been obvious to incorporate prior art "multi-country" telephone dialers into a modem. (Malz Decl., Ex. 5 at AL 15224-25.) To overcome the PTO's rejection, the patentee amended the claims to require a "hardware related parameter." The prosecution history discloses that "[t]he applicant has amended the claims to require that at least one hardware related parameter be stored for a plurality of countries, and that the modem include means for changing the hardware accordingly." (Malz Decl. Ex. 6 at AL 15231-32.) Furthermore, the patentee stated as follows:

It should be recognized that software parameters (such as e.g. make/break for pulse dialing) do not change the hardware configurations. Rather, they simply change the use of the hardware as provided. However, claim 1 (and claim 13), now requires a change in the actual hardware configuration such as would be required to change the line impedance or transmit line signal level.

(Malz Decl., Ex. 6 at AL 15232.) Based on these statements, Agere and USR conclude that the patentee made clear that hardware parameters require changing the actual hardware configuration rather than simply changing the use of the hardware as provided.

Thus, it appears that the critical disagreement between the parties stems from whether the '561 patent has properly distinguished hardware parameters from any other types of parameters including software parameters.FN3 Initially, the Court disagrees with PCTEL's conclusion that "hardware related parameter" has a plain and understood meaning, and that no construction of the term is necessary. PCTEL's alternative construction of "characteristics relating to the electrical/physical properties of circuitry" is also unhelpful because it provides the Court no guidance with regard to differentiating a hardware parameter from any other type of parameter. Moreover, this construction finds no support in the intrinsic evidence or the prosecution history of the patent, and therefore must be rejected.

FN3. The patent's specification certainly does not help clarify this distinction. In fact, the '561 patent specification confuses any potential distinction by stating: "[t]he terms 'hardware related parameters' and 'software parameters' should be understood in a liberal sense as the hardware related parameters described here are actually controlled by software and hence are 'hardware/software' parameters. Likewise, various of the 'software related parameters' may include hardware implementation depending on the particular product." '561 patent, col. 11:12-19.)

The Court finds that Agere and USR's citation to the language of claim 1 and claim 10 are helpful in resolving the construction of "hardware operating parameter." The words of claim 1 indicate that the change in hardware configuration is in accordance with the operating or hardware parameter. '561 patent, col. 11:37-39. The language in claim 10 also supports this conclusion. Furthermore, the patentee explicitly identified "line impedance" and "transmit line signal level" as examples of "hardware related parameters. " '561 patent, col. 10:37-54.

However, the prosecution history of the '561 patent conclusively establishes the required connection between the "hardware parameters" and the "hardware configuration." The patentee explicitly stated that "software parameters ... do not change hardware configurations" but "simply change the use of the hardware as provided." (Malz Decl., Ex. 6 at AL 15232.) This statement strongly suggests, by negative implication, that hardware parameters must change hardware configurations and not just the use of the hardware as provided. The patentee further explained that the claims "require a change in the actual hardware configuration" in attempting to differentiate between hardware and software parameters. (Malz Decl., Ex. 6 at AL 15232.) Thus, Agere and USR's proposed construction incorporates the patentee's own explanation of the distinguishing features of the invention as well as the claim language itself. Thus, the Court construes "hardware operating parameter" as *an operating parameter (such as "line impedance" or "transmit line signal level") that when changed requires a change in hardware configuration not simply a change in the use of the hardware provided*.

**C. *Changing a[the] Hardware Configuration* (Claims 1, 9, 10, 16)**

PCTEL contends that the term means "the electrical/physical properties of circuitry." Agere and USR contend that the term is indefinite under s. 112, para. 2. Alternatively, Agere argues that the term means "changing the relative physical arrangement of non-programmable structures on the modem board; not merely changing the use of those structures as provided." USR asserts that the term should be construed as follows: "mechanically changing the arrangement of electrical interconnections of physical, non-programmable structures on the data communication apparatus."

PCTEL's interpretation once again solely relies upon the declaration of expert witness Dr. Wicker. As explained above, PCTEL's proposed construction is problematic because it has no intrinsic support in the '561 patent, the prosecution history, or even the ordinary meaning of "hardware" or "configuration" as taken from technical dictionaries. Furthermore, this construction provides no guidance with regard to differentiating a hardware configuration from software changes, which appears to be a crucial distinction which the patentee relied upon to obtain the '561 patent. Finally, PCTEL's proposed construction is flawed because it seeks to read "hardware configuration" out of the claims by construing it no differently than "hardware related operating parameter."

Agere and USR's proposed construction relies heavily upon technical dictionaries available at the time the patent was issued. Claim terms mean what they say and have the ordinary meaning that would be attributed by one skilled in the relevant art. *See* Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed.Cir.2002) (citing several cases for this proposition). The Federal Circuit recently reaffirmed that dictionaries, encyclopedias, and treatises are particular useful resources to assist the court in determining the ordinary meaning of claim terms. Phillips v. AWH Corp., 415 F.3d 1303, 2005 WL 1620331, (Fed.Cir. July 12, 2005). However, the *Phillips* court warned that "heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the

term in the abstract, out of its particular context, which is the specification." *Id*. at *14. Thus, in determining the "ordinary meaning" of a claim term, the district court must initially focus on "how the patentee used the claim term in the claims, specification, and prosecution history." *Id*. If these sources of evidence prove unhelpful, then courts may turn to dictionary definitions to illuminate the "ordinary meaning" of the claim term. *Id*.

In order to overcome the "heavy presumption" in favor of the ordinary meaning, such evidence must express "manifest exclusion." *See* Teleflex Inc. v. Ficosa North American Corp., 299 F.3d 1313, 1326 (citation omitted). In *Texas Digital Systems,* the court stated: "if the meaning of the words themselves would not have been understood to persons of skill in the art to be limited only to the examples or embodiments described in the specification, reading the words in such a confined way would mandate the wrong result ..." 308 F.3d at 1205; *see also* Teleflex, 299 F.3d at 1326 ("[t]hat claims are interpreted in light of the specification does not mean that everything in the expressed in the specification must be read into all the claims ...") (citation and quotation marks omitted). "Generally, particular limitations or embodiments appearing in the specification will not be read into the claims." Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 867 (Fed.Cir.1985), *overruled on others grounds by* Nbelpharma AB v. Imnplant Innovations, Inc., 141 F.3d 1059 Fed. Cir.1998) (cited by Texas Digital Systems 308 F.3d at 1204).

Here, there is no genuine dispute that the claim language, the specification, and the prosecution history are not helpful in ascertaining the ordinary meaning of "changing a[the] hardware configuration." Therefore, the Court is permitted to examine technical dictionaries to determine the "ordinary meaning" of the claim term. Agere and USR assert that the ordinary meaning of "hardware" is "physical equipment used in data processing, as opposed to computer programs, procedures, rules and associated documentation." FN4 (Malz Decl, Ex. 10 at AL 15292 and AL 15296, *IEEE Standard Dictionary of Electrical and Electronics Terms,* (1984) & (1988)). Agere and USR also assert that the ordinary meaning of "configuration" must include an arrangement of parts. (Tang Decl., Ex. 10, *SAMS Modern Dictionary of Electronics* (1984)) (defining "configuration" as "the relative arrangement of parts (or components) in a circuit); (Tang Decl., Ex. 8, *IEEE Standard Dictionary of Electrical and Electronics Terms* (1984)) (defining "configuration" as "their geometrical arrangement including the size of the wires and their relative positions with respect to other conductors and the earth"). Based on these definitions, the Court finds that the ordinary meaning of "hardware configuration" would necessarily included a "physical arrangement."

FN4. Other dictionaries provide similar definitions. *See McGraw Hill Dictionary of Electronics and Computer Technology* (1984) (defining "hardware" as "physical, tangible, and permanent components of a computer or a data processing system").

However, PCTEL also takes issue with other language that Agere and USR attempt to include in their proposed constructions. First, Agere and USR's proposed construction restricts the scope of the claim by including the term "non-programmable." Second, Agere and USR's proposed construction requires that the structures that constitute the "hardware configuration" be "on" the modem board. Third, USR's interpretation seeks to limit the scope of the claims to only "mechanical" changes. The Court will discuss the inclusion of each of these proposed terms in turn.

***1. Non-Programmable***

USR asserts that the inclusion of "non-programmable" is directly supported by the patent specification

which indicates that the programmable part of the modem, the software in microprocessor 40 that controls the other components, is separate from the hardware being configured which is incapable of running software and thus non-programmable. '561 patent, 10 :38-57. USR also asserts that the ordinary meaning of hardware in technical dictionaries specifically notes a difference between, software which is programmable, and hardware, which is not.

PCTEL responds that a preferred embodiment of the patent discloses a modem that uses duplicate circuits for achieving two different impedances. '561 patent, col. 10:34-46. According to this embodiment, one circuit for providing first impedance is connected to a first port or a microprocessor, and a second circuit for providing a second impedance is connected to a second port of the microprocessor. PCTEL asserts that this preferred embodiment discloses that the microprocessor is programmed to select between the two ports depending upon the impedance needed for the country in which the modem is to be used. PCTEL argues that Agere and USR's proposed construction excludes a preferred embodiment of the '561 patent, and thus is too narrow.

The Court agrees with Agere and USR that the consensus of technical dictionaries makes clear that "hardware" differs from "software," which is programs. (Tang Decl., Ex. 8, *IEEE Dictionary* (1984)) (noting that "hardware" is "physical equipment used in data processing, as opposed to computer programs, procedures, rules and associated documentation"); (Tang Decl., Ex. 9, *Dictionary of Computers, Information Processing & Telecommunications* (1987) (same)). Furthermore, despite PCTEL's assertion to the contrary, the Court does not find that the specification discloses a preferred embodiment that describes programmable hardware. Rather, an examination of the preferred embodiment supports USR's position, namely, that the programmable microprocessor is clearly separate from the "non-programmable" hardware. '561 patent, col. 10:34-46. Hence, the Court concludes that "hardware configuration" should be construed as "non-programmable."

***2. "On" the Modem***

Agere and USR assert that the hardware must reside on the data communication apparatus on the '561 specification. In support of their argument, they contend that the specification does not identify an embodiment where the hardware components are not within the "data communication apparatus 10." PCTEL responds that Agere and USR's proposed construction should be rejected because no such limitation can be found in the claims.

The Court agrees with PCTEL. USR's implicit argument that the scope of the claims is limited to the examples set forth in the specification is contrary to law. "A patentee may claim an invention broadly and expect enforcement of the full scope of that language absent a clear disavowal or contrary definition in the patent's specification." Home Diagnostics, Inc. v. Lifescan, Inc., 381 F.3d 1352, 1357 (Fed.Cir.2004). Here, the specification contains no such disavowal or contrary definition. Thus, the Court will not limit the "hardware configuration" to being "on" the modem board.

***3. "Mechanical Change"***

USR asserts that a change in the arrangement of the various hardware components of the '561 patent would require a mechanical switch which changes the circuit paths by movement of the connector of a switch. USR contends that such a mechanical switch would not be present on programmable structures such as a microprocessor. USR concludes that its interpretation is consistent with the '561 patent specification and prosecution history because a change in line impedance and changing a set of resistors for transmit signal

line level could be performed by a mechanical switch, such as a relay. In support of its arguments, USR relies exclusively on its expert witness Dale Walsh.

PCTEL responds that while the patent discusses using mechanical switches to change modem speed options, asynchronous or synchronous communication modes, and other options, these options have nothing to do with configuring for country of intended use. PCTEL asserts that country specific parameters are changed by the microprocessor and arrange the modem hardware. '561 patent, col. 10:38-57. PCTEL also notes that the patent itself refers to switching or circuit logic, which is not mechanical switching, but rather solid state. '561 patent, col. 10:48-51.

The Court agrees with PCTEL that the patent does not require a mechanical switch to change the arrangement of the various hardware components of the '561 patent. It appears, as noted by PCTEL, that the specification explicitly allows for the hardware configuration to be changed through the use of circuit logic, which is clearly distinguished from mechanical switching. '561 patent, col. 10:46-51. In any event, "particular limitations or embodiments appearing in the specification will not be read into the claims." Loctite Corp. ., 781 F.2d at 867. The word "mechanical" is found nowhere in the patent claims. Thus, the Court will not read such a limitation into the claims.

In sum, given the considerations discussed above, the Court construes "changing the hardware configuration" as *changing the physical arrangement of non-programmable structures*.

**D. *Means for Changing the Hardware Configuration* (Claims 1, 9, 10, 16)**

The parties agree that this is a means-plus-function limitation whose function is "changing the hardware configuration...." The parties disagree regarding whether the specification discloses a corresponding structure that performs this function and, if so, what that structure is.

PCTEL contends that the corresponding structure is "switching circuitry, or circuit logic, and equivalents thereof." FN5 Agere and USR assert that the structure is indefinite under s. 112, para. 2. Alternatively, Agere argues that the structure is "hard switches 85 of modem 10." USR alternatively asserts that the structure is "a switch that (i) mechanically changes the electrical interconnection between duplicative circuitry or a set of resistors in parallel on the data communication apparatus, and (ii) does not simply change the use of the hardware as provided.

FN5. In the prior ITC case and in its P.L.R. 4-3 Statement in this case, PCTEL identified "duplicative circuitry" as a "means." However, PCTEL now admits that "duplicative circuuitry" cannot be a "means for changing the hardware configuration.

To support its proposed construction, PCTEL relies upon two sentences of the '561 patent. The specification states that "[p]referably, however, instead of duplicative circuitry, control of the impedance may be had via switching or circuit logic such that by raising the logic level of a second port, the logic circuitry connected to the first and second ports could control the line impedance." '561 patent, col. 10:46-51. The specification further teaches that "[b]y providing a set of resistors in parallel which could be switched in or out by the microprocessor according to the desired signal level, the transmit line signal level (e.g. 0 to -15 dBm) can be controlled." '561 patent col. 10:54-57.

In regards to its indefinite argument, Agere and USR contend that the specification fails to clearly identify any structure that could perform the function of "changing the hardware configuration." Agere and USR note that the '561 patent does not recite the term "switching circuitry" anywhere. Regarding "circuit logic," Agere asserts that the term is used only once in passing in the patent, and in any event, dictionary dictionaries demonstrate that "logic" refers to a functional operation rather than structure. Agere also notes that "circuit logic" does not qualify as corresponding structure because it is not clearly linked to the critical function of "changing the hardware configuration."

In support of its alternative construction, Agere notes that figure 1 shows hard switches 85 connected to the processor, as required by claims 1 and 10. Thus, Agere concludes that hard switches 85 is the only disclosed structure that could arguably perform the recited function. USR supports its proposed construction by asserting that the only types of switches which accomplish a change in the circuit paths or arrangement are a mechanical switch that has moving parts. USR also asserts that "not changing the use of the hardware" is taken directly from the prosecution history.

Moreover, the parties dispute whether the modem's microprocessor could constitute structure that corresponds to the specified function. PCTEL admits that "processing means" is a distinct claim from "means for changing the hardware configuration," but argues that it does not follow that the structure for the "processing means" must be distinct from the structure for the "means for changing the hardware configuration." Agere and USR disagree, and assert that microprocessor is separate and distinct from the "switching circuitry" that PCTEL regards as the "means for changing the hardware configuration."

As an initial matter, the Court finds that "switching circuitry" or "circuit logic" are sufficiently definite structure .FN6 In Apex Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1373 (Fed.Cir.2003), the Federal Circuit stated that "[w]hile we do not find it necessary to hold that the term 'circuit' by itself always connotes sufficient structure, the term 'circuit' with an appropriate identifier such as 'interface,' 'programming' and 'logic,' certainly identifies some structural meaning to one of ordinary skill in the art." Similarly, in Linear Tech. Corp. v. Impala Linear Corp., 379 F.3d 1311, 1320 (Fed.2004), the court stated that "when the structure-connoting term "circuit" is coupled with a description of the circuit's operation, sufficient structural meaning generally will be conveyed to persons of ordinary skill in the art...." The Court also disagrees with Agere's contention that "logic," when combined with "switching" or "circuit," describes a functional operation rather than a definite structure. (O'Grady Decl., Ex. 2, *IEEE Standard Dictionary of Electrical and Electronics Terms* (1984)) (defining logic as "[p]ertaining to the type or physical realization of logic elements used, for example, diode logic, AND logic.")

FN6. The Court agrees with Agere and USR that the '561 patent does not disclose "switching circuitry" anywhere, and hence it cannot properly be identified as corresponding structure. Rather, the specification reveals "switching or circuit logic." During oral argument, PCTEL admitted that "switching circuitry" and "circuit logic" are essentially synonymous terms. Since "circuit logic" is explicitly mentioned in the specification, the Court will use that term in its analysis.

The Court also finds that circuit logic is "corresponding," as it is clearly linked to the function of "means for changing the hardware configuration." *See* Kahn, 135 F.3d at 1476. The specification states that:

The hardware could either comprise duplicative hardware where the line impedances connected with a first and second transmission port of the microprocessor would be different and the data would be sent out over

the desired port [in] accord with the store parameter. Preferably, however, instead of duplicative circuitry, *control of the impedance may be had via switching or circuit logic* such that by raising the logic level of a second port, the logic circuitry connected to the first and second ports could control the line impedance.

'561 patent, col. 10:39-51. This specification language clearly discloses a preferred embodiment in which the "circuit logic" is utilized to control the line impedance level (hardware related parameter). Thus, the Court concludes the '561 patent makes a clear linking between the claimed function ("changing the hardware configuration") and structures for performing the claimed function ("switching or circuit logic"). Accordingly, the claims of the '561 patent satisfy the requirement of s. 112, para. 6, and are not indefinite.

Regarding whether the microprocessor is the switching circuitry which would permit the hardware configuration to change, the Court finds that it is not. It appears the parties agree that the claims themselves make clear that the "processing means" is distinct from the "means for changing the hardware configuration." PCTEL argues that there is no reason the microprocessor cannot be the structure of both the "processing means" and the "means for changing." The Court disagrees. Claim 1 indicates that the "processing means" is arranged to permit "said processing means to cause said means for changing the hardware configuration to assume a proper configuration ." '561 patent, col: 11-51-54. Based on this language, it is apparent that the microprocessor must be separate from the "means for changing the hardware configuration."

Finally, the Court finds that both Agere and USR's proposed constructions are flawed. USR's attempt to limit the structure to a mechanical switch fails for the reasons previously stated. Furthermore, Agere's identified structure of "switches 85" in Figure 1 of the patent clearly relate to changing of the software configuration and therefore cannot be the means for changing the hardware configuration. *See* '561 patent, col. 3:22-26 ("The actions of the microprocessor are controlled ... by the option switches 85."); *see also* '561 patent, col. 3:52-4:6.

Therefore, the Court finds that the only structure corresponding to "means for changing the hardware configuration" is *switching or circuit logic*.

**E. *To Assume a Proper Configuration* (Claim 1)**

PCTEL contends that the term requires no construction. Agere and USR state that the term means "to assume a proper hardware configuration."

The Court agrees with Agere and USR. Agere and USR base their interpretation on the relation of this term to the remaining language in claim 1. The only configuration that is identified in claim 1 is a "hardware configuration." In fact, the term in context reads "to cause said means for changing the hardware configuration to assume a proper configuration." '561 patent, col. 11:52-54. Thus, it appears to the Court that the "proper configuration" in this claim obviously refers to the hardware configuration term that proceeded it. Accordingly, the Court construes "to assume a proper configuration" as *to assume a proper hardware configuration*.

**II. The '950 and** '780 Patents

**A. *Host Signal Processing (modem/communication system)***

PCTEL asserts that this term does not require construction. Alternatively, PCTEL contends that the term

means "an apparatus/system for transmitting and receiving signals that uses the CPU of a computer to process (including modulating and demodulating) digital representation(s) of the signals." Agere contends that the term means "a modem/communication system that utilizes the processing power of the central processing unit of a host computer to process signals rather than including a dedicated digital signal processor."

***1. Preamble language***

PCTEL argues that this term does not require construction because "host signal processing communication system" appears only in the preambles of claim 1 of both the '950 and '780 patents, and the term "host signal processing modem" appears only in the preambles of claims 13-15 of the '950 patent and claims 7-9 of the '780 patent. PCTEL asserts that claim 1 of the '950 and '780 patents define a structurally complete invention and therefore the preamble should not act as a limitation.

Agere responds that the term "host signal processing modem" appears in claim 3 of both patents, and therefore is not simply used as preamble language. Moreover, Agere argues that the intrinsic record reveals that these terms were necessary to define the invention of the '950 and 780 patents, and thus the preamble is properly deemed a part of the claim limitations.

"Whether to treat a preamble as a limitation is a determination 'resolved only on review of the entire[ ] ... patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim." ' Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808 (Fed.Cir.2002) (quoting Corning Glass Works v. Sumitomo Electric U.S.A., Inc., 868 F.2d 1251, 1257 (Fed.Cir.1989). The *Catalina* court stated that "[i]n general, a preamble limits the invention ... if it is 'necessary to give life, meaning and vitality' to the claim...." *Id*. (citation omitted). "Moreover, clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention." *Id*. at 808. However, a preamble will not limit a claim where the body of the claim "describes a structurally complete invention such that deletion of the preamble ... does not affect the structure ... of the claimed invention." *Id* . at 809.

As an initial matter, the Court finds that "host signal processing modem" appears in claim 3 and, accordingly, is not simply used as preamble language. Further, it appears that the preamble has greater weight than PCTEL acknowledges. The prosecution history reveals that PCTEL clearly relied on the preamble language during the prosecution history. After the initial claims were rejected in light of prior art, the patentee wrote the PTO and stated that "[c]laim 1 distinguishes over Gross by reciting, 'A host signal processing communication system." ' (Mills-Robertson Decl., Ex. 7 at AL 014994.) The patentee also quoted the following specification language: "Host signal processing modems reduce the cost of providing modem functions to a computer system by utilizing the processing power of the central processing unit ... of a host computer rather than including a dedicated signal processor ... in modem hardware." (Mills-Robertson Decl., Ex. 7 at AL 014994.) Based on these statements to the PTO, it is clear that the patentee distinguished prior art based on the terms "host signal processing communication system" and "host signal processing modem." Thus, the Court disagrees with PCTEL that these terms are merely preamble language that do not require construction.FN7 Rather, it appears that the preamble terms give "life, meaning, and vitality" to the claims.

FN7. PCTEL's reliance on Intirtoo, Ltd. v. Texar Corp., 369 F.3d 1289, 1296 (Fed.Cir.2004) is misplaced. In

*Intirtoo,* the court refused to construe the preamble because the prosecution history distinguished the prior art based on the body of the claims, rather than on the preamble. Here, in contrast to *Intirtoo,* the patentee's reliance on the preamble to distinguish prior art is readily apparent. Furthermore, this conclusion remains unchanged even if, as PCTEL contends, the patentee also relied, at least in part, on limitations found in the body of the claims to distinguish prior art. *See* Bell Communication Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620 (Fed.Cir.1995) ( [W]hen the claim drafter chooses to use *both* the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects.") (emphasis added).

***2. Construction***

The parties central dispute surrounding the construction of these terms is whether the host signal processing modem/communication system can include a dedicated signal processor. Agere's proposed construction includes the phrase "rather than including a dedicated digital signal processor," and relies upon the specification and prosecution history for this limitation. Specifically, the specification of the '950/'780 patents states that "[h]ost signal processing (HSP) modems reduce the cost of providing modem functions to a computer by utilizing the processing power of the central processing unit (CPU) of a host computer rather than including a dedicated digital signal processor (DSP) in modem hardware." '950 patent, col. 1:13-17; '780 patent, col. 1:18-22. Similarly, the prosecution history of the '950 patent confirms that in order to obtain allowance of the claims, the patentee expressly distinguished the Gross patent by stating:

"Claim 1 distinguishes over Gross by reciting, "A host signal processing communication system." As indicated in Applicant's specification, "Host signal processing modems reduce the cost of providing modem functions to a computer system by utilizing the processing power of the central processing unit ... of a host computer *rather than including a dedicated signal processor ... in modem hardware*." [ ]In contrast, Gross describes a system *including a modem digital signal processor 20 ....*

(Mills-Robertson Decl., Ex. 7 at AL 14994.

Based on this language, the Court finds that the patentee clearly indicated that the claims do not cover systems that include digital signal processors in modem hardware. *See* Spring Window Fashions LP v. Novo Industries, L.P., 323 F.3d 989 (Fed.Cir.2003) (holding that a reasonable competitor could rely on unequivocal statements of disclaimer made during the prosecution history).

Finally, during oral argument, PCTEL argued that the "signals" being processed by the central processing unit are "communication signals transmitted by the communication system/modem." The Court agrees. Thus, the Court's construction of this term closely mirrors the explicit language used by the patentee in both the specification and the prosecution history, and is as follows: *a modem/communication system that utilizes the processing power of the central processing unit of a host computer to process communication signals rather than including a dedicated digital signal processor.*

**B. *Host Processor*** ('950 patent**, claims 1, 8, 11, 13, 14)**

PCTEL suggests the following construction of "host processor": "the CPU(s) of a computer such as a set top box, that processes digital representations(s) of signals, rather than including a digital signal processor dedicated to perform signal processing (including modulating and demodulating) in modem hardware." Agere proposes the following construction of the disputed phrase: "central processing unit of a host

computer."

PCTEL's asserts that its proposed construction is accurate because a jury may believe that a computer is limited only to a "personal computer," and that devices that have names that do not include the word computer ( *e.g.,* set top box) are not computers. However, PCTEL fails to cite the disclosure of such devices in the claims, specification, or prosecution history.

Agere relies upon the intrinsic record and the ordinary meaning of the term to support its construction. Agere states that its proposed construction is consistent with contemporaneous technical definitions of "host" as "[a] device, typically a personal computer, that will control the communications with attached peripherals." (Mills-Robertson Decl., Ex. 10 at AL 15385, *The IEEE Standard Dictionary of Electrical and Electronics Terms* (1996)). Agere also notes that the specification states that "[h]ost signal processing (HSP) modems reduce the cost of providing modem functions to a computer system by utilizing the processing power of the central processing unit (CPU) of a host computer ...." '950 patent, col. 12-17; '780 patent, col. 1:18-22.

Essentially, the proposed constructions of the parties are not significantly different. Although PCTEL objects to the use of the word "host," the Court agrees with Agere's conclusion that defining "host" as the "computer" or "host computer" comports with the ordinary meaning of the term. It also comports with the way in which the term is used in the patents. The specification states that "the computer system 100 includes a main or host processor 110" and that in the exemplary embodiment, "the computer 100 is an IBM compatible computer. " '950 patent, col. 3:28-32; '780 patent col. 3:19-24.

Furthermore, the Court also agrees with Agere that PCTEL's inclusion of the phrase "including a specialized computer such as a set top box" is misplaced, as such language finds no support in the intrinsic evidence, prosecution history, or ordinary meaning of the term. Moreover, PCTEL's conclusion that a jury may believe that a computer is limited only to a "personal computer" is, at best, speculative.

Finally, PCTEL's proposed construction includes the phrase "rather than including a digital signal processor dedicated to perform signal processing (including modulating and demodulating) in modem hardware." The Court agrees with Agere that this language appears unnecessary as the host processor is part of the computer and not part of modem hardware.

Therefore, based on the ordinary meaning of the term and the intrinsic evidence, the Court construes "host processor" as *the central processing unit of a host computer*.

**C. *Periodically Asserts a First Signal While Operating in the First Mode*** ('950 patent**, Claims 1, 13;** '780 patent**, Claims 1, 7)**

PCTEL contends that the disputed term is defined as "the assertion of a first signal that recurs or repeats, at time intervals that are not necessarily precise or the same, which must occur, at least, some time during the first mode." Agere contends that the term is limited to "produces and repeats an identical non-DMA related signal at regular intervals while operating in a first mode (the normal mode of operation).

PCTEL states that its proposed construction is consistent with intrinsic evidence, which discloses embodiments wherein the interrupt signal does not recur at regular intervals. *See* '950 patent, col. 4:12-15; '780 patent col. 4:4-7. PCTEL also relies upon U.S. Patent No. 5,721,830 ("the '830 patent"), which is

incorporated by reference into the '950 and '780 patents, to argue that not all interrupts occur at regular intervals. PCTEL also asserts that the prosecution history does not clearly indicate that the patentee disclaimed DMA related signals from being interrupts.

Agere contends that its construction of "periodically" as occurring a regular intervals is consistent with the ordinary meaning of that term. (Mills-Robertson Decl., Ex. 16, *McGraw-Hill's Dictionary of Scientific and Technical Terms* (1994) (defining "periodic" as "[r]epeating itself identically at regular intervals"). Agere also asserts that its proposed construction is consistent with the specification, and the single disclosed embodiment that generates "periodic" interrupts every 3.3 milliseconds. *See* '950 patent, col. 4:4-12; '780 patent 3 :63-4 :4. Agere also notes that its construction excludes "DMA-related signals" to account for the alleged disclaimer that PCTEL made to the PTO.

As an initial matter, the Court must determine the ordinary and customary meaning of "periodically." Following the Federal Circuit's teaching in *Phillips,* the Court begins by reviewing the specification.FN8 Phillips, 2005 WL 1620331, at 13. In support of PCTEL's argument that the inventor intended to give special meaning to "periodically," it cites the following specification language: "More generally, the number of samples read or written per interrupt is *about equal* to the product of the period of the interrupts and a sampling frequency used by converters 34. " '950 patent, col. 4:12-15; '780 patent, col. 4:4-7 (emphasis added). Based on this language, PCTEL asserts that since the sampling frequency used by the converters 134 is fixed, a change in time between interrupts results in a change in the number of samples read or written to the buffer so that the near equality ( *i.e.,* about equal) is maintained.FN9

FN8. The Court agrees with Agere that, based on the only technical dictionary definition provided by the parties, the ordinary meaning of "periodically" is "repeating itself identically at regular intervals." To the extent that PCTEL relies upon general-usage dictionaries to support its argument that periodically means "from time to time," such reliance is misplaced. *See* Vanderland Indus. Nederland BV v. I.T.C., 366 F.3d 1311, 1321 (Fed.Cir.2004) (stating that general-usage dictionary definitions are irrelevant where an artisan would attach a special meaning to the term).

FN9. To the extent that Agere seeks to limit the patents' claims to preferred embodiment that generates interrupts every 3.3 milliseconds, the Court rejects this argument. *See* Ekchian v. Home Depot, Inc., 104 F.3d 1299, 1303 (Fed.Cir.1997) (holding that courts should not "limit[ ] the claimed invention to preferred embodiments or specific examples in the specification.").

During the ITC investigation, an ALJ considered whether the term "periodic" and "periodically" in the claims of the '950 and '780 patents required that interrupts occur at regular intervals and concluded that:

Therefore, the foregoing "about equal" relationship means that the relationship between the number of samples read or written per interrupt varies inexactly with the periodicity of the interrupts. In other words, the longer or shorter the interval between interrupts, the more or fewer samples will be read or written, but not by an exact ratio. One likely reason for this inexactitude is because the interval between interrupts itself varies, even though those interrupts are considered in the art and the patent itself to be "periodic."

(O'Grady Decl., Ex. 7 at P0007715-P0007716). While the ITC decision is not binding, *see* Texas Instr. Inc. v. Cypress Semiconductor Corp., 90 F.3d 1558, 1569 (Fed.Cir.1996), the Court concludes that the ALJ's

conclusion was well reasoned and persuasive. It appears that the only requirement for the time between interrupts is to keep the computer's power management system from switching the device from the first ("normal") to the second ("wait") mode. In this respect, it does not appear that the specification requires the time between such interrupts to be exact.FN10

FN10. The ITC concluded, and the Court agrees, that the specification of the '830 patent also supports this conclusion.

Regarding the issue of "DMA-related signals," the prosecution history reveals that, in an attempt to overcome the examiner's original rejection, PCTEL distinguished the Gross patent as follows:

Gross does not suggest providing an interrupt signal to a host computer. Typically, conventional modems such as Gross discloses, transfer data to a host computer using DMA transfers to avoid disturbing the host processor. Accordingly, Gross fails to suggest a device that 'periodically asserts a first signal while operating in the first mode....

(Mills-Robertson Decl., Ex. 7 at AL 14994-95).

Based on this disclaimer, Agere contends that PCTEL expressly distinguished DMA transferring modems from its invention. PCTEL disagrees, and asserts that it is the transfer of data, not the use of "DMA transfers," that avoids having to disturb the host computer. PCTEL notes that since what is being transferred from the hardware modem (as in Gross) to the host computer is data, the host computer need not run any software to convert the material it receives from the modem into data. To the contrary, when digital samples are transferred from the HSP modem to the host computer (as in the '950 patent), the host computer must be interrupted and its processor must run HSP software that converts digital samples into data.

The Court finds that PCTEL's interpretation of the prosecution history is reasonable. Without further disclaimer language, the Court cannot conclusively determine that the patentee distinguished Gross based on the use of "DMA transfers" as opposed to the "transfer of data." *See* Omega Eng'g, Inc. v. Raytek, Corp., 334 F.3d 1314, 1326 (Fed.Cir.2003) (stating that for prosecution disclaimer to attach, the alleged disavowing actions or statements made during prosecution be both clear and unmistakable). Given that the patentee's disclaimer of "DMA transfers" was not "clear and unmistakable," prosecution disclaimer does not attach.

Given these considerations, the Court construes "periodically asserts a first signal while operating in the first mode" as *the assertion of a first signal that recurs or repeats at regular intervals while operating in the first mode*.

**D. *As the Interrupt Signal*** ('950 patent**, claims 1, 13;** '780 patent**, claims 1, 7)**

Agere contends that the term means "as the one and only signal to the host computer from the device that forces the host processor to temporarily suspend other tasks while addressing the device, which signal is not asserted in conjunction with Direct Memory Access transfers." PCTEL contends that the term means "as a signal that attempts to get the attention of a processor."

Agere's proposed construction is based on the ordinary meaning of the term, the intrinsic evidence, and the prosecution history. Agere contends that the ordinary meaning of "interrupt" is "[a] temporary suspension of

a process caused by an event outside of that process...." (Mills-Robertson Decl., Ex. 14 at 13, *Newton's Telecom Dictionary* (1997). Agere also states that "as the interrupt signal" refers to only one signal, as the word "the" is used to modify the term that follows it by making that word singular and specific. Agere contends that this conclusion is supported by the following claim language: "the selection logic selects the first signal as the interrupt signal when the device is operating in the first mode and selects a second signal from the communication lines as the interrupt signal when the device is operating in second mode." '950 patent, col. 6:53-57. Agere also cites to the specification to support its position. '950 patent col. 4:32-61, 4:62-5:6, 5:22-29; '780 patent col. 4:23-53, 4:54-64, 5:13-22. Finally, Agere asserts that the prosecution history reveals that PCTEL limited the claim coverage to a single, specific interrupt signal.

PCTEL responds that it has become standard practice to use indefinite articles ( *i.e.*, "a" and "an") the first time a claim term is introduced, and definite articles ( *i.e.,* "the" and "said" when the claim term is mentioned subsequently.FN11 PCTEL also asserts that the term "comprising" in a claim term means that the claim covers devices that contain "at least" the elements in the claim. *See* Genentech, Inc. v. Chiron Corp., 112 F.3d 495, 501 (Fed.Cir.1997) (" 'Comprising' is a term of art used in claim language which means that the named elements are essential, but other claims may be added...."). PCTEL contends that the '950 and '780 patents reflect both of these general drafting principles. Hence, PCTEL argues that the definite article "the" in the claim term "as the interrupt signal" simply makes clear that the signal that is selected by the selection logic is the same signal that causes the software to be executed by the host processor. Moreover, PCTEL argues that the use of the indefinite article "an" in conjunction with the open-ended claim term "comprising" evidences the applicant's intent that the claims cover products wherein the software is executed in response to more than one interrupt signal.

FN11. Inexplicably, PCTEL cites two non-patent cases for this proposition. *See e.g.* Freytag v. Commissioner, 501 U.S. 868, 902, 111 S.Ct. 2631, 115 L.Ed.2d 764 (1991); American Bus Ass'n v. Slater, 231 F.3d 1, 4-5 (D.C.Cir.2000).

In construing this term, the Court agrees with Agere that ordinary meaning of "interrupt" is a signal that forces the host processor to temporarily suspend other tasks. (Mills-Robertson Decl., Ex. 22, *Oxford Dictionary of Computing* (1996)) ("A signal to a processor indicating that a asynchronous event has occurred. The current sequence of instructions is temporarily suspended (interrupted), and a sequence appropriate to the interruption is started in its place."); (Ex. 23, *Webster's New World Dictionary of Computing Terms* (1997)) ("A signal to the microprocessor indicating that an event has occurred that requires its attention. Processing is halted momentarily so that input/output to other operations can take place."); (Ex. 26, *The IEEE Standard Dictionary of Electrical and Electronics Terms* (1996)) ("The suspension of a process to handle an event external to the process.").

Regarding the parties' dispute over whether "as the interrupt signal" refers to only one signal, the Court finds Agere's reliance on the prosecution history is unpersuasive. The PTO originally rejected claim 1 because it was unclear where the interrupt signal was coming from. (Mills-Robertson Decl., Ex. 19 at 14982). Accordingly, the applicant specifically amended claim 1 to include "as the interrupt signal" to overcome the examiner's objection:

The Examiner indicated that claim 1 was unclear as to the source of the interrupt signal. Amended Claim 1 now recites, "the selection logic being coupled to select the interrupt signal provided to the host processor, wherein the selection logic selects the first signal *as the interrupt signal* when the device is operating in the

first mode and selects a second signal from the communication lines *as the interrupt signal* when the device is operating in the second mode." Accordingly, amended claim 1 clearly indicates the source of the interrupt signal.

(Mills-Robertson Decl., Ex. 7 at AL 14994 (emphasis added).

Based on this amendment, the U.S. Patent examiner for the '780 patent approved claim 1 precisely because it distinguished between interrupts from two different sources:

The following is an examiner's statement of reasons for allowance: the selection logic that distinguishes between interrupts from two different sources when in two different modes.

(Mills-Robertson Decl., Ex. 20 at AL 15079).

However, by clarifying that the selection logic selects the interrupt that causes the host processor to execute the software, the Court is not convinced that PCTEL limited the claim so that either the first or the second signal must be exclusively selected as the interrupt. *See* Omega Eng'g, Inc. v. Raytek, Corp., 334 F.3d 1314, 1326 (Fed.Cir.2003) (stating that for prosecution disclaimer to attach, the alleged disavowing actions or statements made during prosecution be both clear and unmistakable). It is certainly possible that the patentee, by using the term "and" to connect the two "selections" made by the selection logic, intended the claim to cover selection logic that can select signals in addition to the first signal when in the first mode and can select signals in addition to the second signal when in the second mode. Thus, the Court construes "as the interrupt signal" as *the signal to the host processor from the device that may cause the host processor to temporarily suspend other tasks while addressing the device*.FN12

FN12. The Court rejects Agere's use of the phrase "which signal is not asserted in conjunction with Direct Memory Access transfers" for the reasons stated in Sec. II(C).

**E. *Periodic Interrupts*** ('950 patent**, Claims 8, 11**)

PCTEL contends that the term means "a signal that recurs or repeats, at time intervals that are not necessarily precise or the same that attempts to get the host processors attention." Agere asserts the proper construction of the term is "an identical signal repeated at regular intervals to the host processor to suspend other tasks on the host processor while the processor addresses the device, which signal is not asserted in conjunction with Direct Memory Access transfers."

This term does not require the Court to engage in any new analysis. For the reasons previously set forth, the Court disagrees with Agere that "periodic" should be construed as "regular intervals." The Court also rejects Agere's use of the phrase "which signal is not asserted in conjunction with Direct Memory Access transfers" for the reasons stated in Sec. II(C). However, the Court agrees with Agere regarding the ordinary meaning of the term "interrupt." Accordingly, the Court construes "periodic interrupts" as *a signal that recurs or repeats, at time intervals that are not necessarily precise or the same, that suspends other tasks on the host processor while the processor addresses the device* .

**F. *Selection Logic***

Agere contends that this term should be construed in accordance with 35 U.S.C. s. 112, para. 6. PCTEL

asserts that the term does not trigger the applicability of s. 112, para. 6.

There is no dispute that the term "selection logic" does not include the term "means." The absence of the word "means" in a claim term raises the rebuttable presumption that the claim term is not written in means-plus-function format. Apex Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1371-72 (Fed.Cir.2003). Agere bears the burden the overcoming the presumption by a preponderance of the evidence. Id. at 1372. To fulfill that burden, it must prove that the claim element "selection logic" fails to "recite[ ] sufficiently definite structure" or recites a "function without reciting sufficient structure for performing that function." Watts v. XL Sys., Inc., 232 F.3d 877, 880 (Fed.Cir.2000).

To determine if a claim term recites sufficient structure, courts generally examine "whether it has an understood meaning in the art." CCS Fitness, Inv. v. Brunswick Corp., 288 F.3d 1359, 1369 (Fed.Cir.2002). Here, PCTEL asserts that "logic" is synonymous with circuitry, while Agere contends that term connotes function. A review of the technical dictionaries supports PCTEL's view that "logic," by itself, can connote structure. (O'Grady Decl., Ex. 16, *McGraw Hill Dictionary of Scientific and Technical Terms* (1994) ("General term for the various types of games, flip-flops, and other on/off circuits...."). The Federal Circuit has stated that courts must not only rely on single words of the limitation, but also view the limitation as a whole. *See* Apex, 325 F.3d at 1372-73. Specifically, the *Apex* court stated that "[w]hile we do not find it necessary to held that the term 'circuit' by itself always connotes sufficient structure, the term 'circuit' with an appropriate identifier such as 'interface,' 'programming' and 'logic,' certainly identifies some structural meaning to one of ordinary skill in the art." *Id*. at 1373. Similarly, in *Linear,* the court stated that "when the structure-connoting term 'circuit' is coupled with a description of the circuit's operation, sufficient structural meaning generally will be conveyed to persons of ordinary skill in the art...." 379 F.3d at 1320.

Claim 1 of the '950 patent claims a host signal processing communication system comprising:

selection logic coupled between the device and the host processor the selection logic being coupled to select the interrupt signal provided to the host processor wherein the selection logic selects the first signal as the interrupt signal when the device is operating in the first mode and selects a second signal from the communication lines as the interrupt signal when the device is operating in the second mode

'950 patent, col. 6:50-57. The Court finds that this contextual language describes the objective of the "logic" ( *i.e.,* selecting the first signal when in first mode and selecting the second signal when in second mode). Additionally, the term "selection" apprises skilled artisans of the function of the claimed "logic."

In response, Agere has only offered a Federal Circuit case construing "selection device" and a district court case construing "logic means." This evidence is not sufficient to overcome the presumption that s. 112, para. 6 does not apply. Therefore, the Court concludes that Agere has not shown by a preponderance of the evidence that one of ordinary skill in the art believes that "selection logic" does not recite sufficiently definite structure. Because "selection logic" is not governed by s. 112, para. 6, the Court finds that no further construction of the term is necessary.

## CONCLUSION

For the foregoing reasons, the Court construes the disputed claim terms as follows:

1. "memory means" is subject to 35 U.S.C. s. 112, para. 6. The corresponding structure is *memory 50,*

*including "RAM," "ROM," "EPROM," or "EEPROM."*

2. "hardware related [operating] parameter" is construed as *an operating parameter (such as "line impedance" or "transmit line signal level") that when changed requires a change in hardware configuration not simply a change in the use of the hardware provided.*

3. "changing a[the] hardware configuration" is construed as *changing the physical arrangement of non-programmable structures.*

4. "means for changing the hardware configuration" is subject to 35 U.S.C. s. 112, para. 6. The corresponding structure is *switching or circuit logic.*

5. "to assume a proper configuration" is construed as *to assume a proper hardware configuration.*

6. "host signal processing (modem/communication system)" is construed as *a modem/communication system that utilizes the processing power of the central processing unit of a host computer to process communication signals rather than including a dedicated digital signal processor.*

7. "host processor" is construed as *the central processing unit of a host computer.*

8. "periodically asserts a first signal while operating in the first mode" is construed as *the assertion of a first signal that recurs or repeats at regular intervals while operating in the first mode.*

9. "periodic interrupts" is construed as *a signal that recurs or repeats, at time intervals that are not necessarily precise or the same, that suspends other tasks on the host processor while the processor addresses the device.*

10. "selection logic" is not subject to 35 U.S.C. s. 112, para. 6. No construction of the term is necessary.

IT IS SO ORDERED.

N.D.Cal.,2005.
PCTEL, Inc. v. Agere Systems, Inc.

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