United States District Court,
D. North Dakota, Southeastern Division.

ALIEN TECHNOLOGY CORPORATION,
Plaintiff.
v.
INTERMEC, INC., Intermec Technologies Corporation, and Intermec IP Corp,
Defendants.

No. 3:06-cv-51

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Claim Construction Opinion & Order

RODNEY S. WEBB**, District Judge.**

The Plaintiff, Alien Technology Corporation ("Alien"), sued the Defendants (collectively "Intermec") for a declaratory judgment of noninfringement or patent invalidity concerning patents Intermec owns in the radio frequency identification ("RFID") industry. The parties have narrowed the case to seven patents-in-issue. On May 14-16, 2008, the Court held a claim-construction hearing, also known as a Markman FN1 hearing. Having reviewed the relevant law and considered the pertinent evidence, the Court now interprets the words and phrases disputed by the parties in turn.

FN1. Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

I. Background

A. RFID Technology FN2

FN2. The Court's recitation of RFID Technology relies on the parties' Joint Background for *Markman* Hearing (doc. # 477).

Radio-frequency identification describes a process where objects are identified by using radio-frequency

waves. RFID systems have two parts: "readers" or "interrogators" and "tags" or "transponders." Readers send out radio-frequency ("RF") waves to prompt a response from a tag, receive RF waves from tags, and process the information received for use by the computer system to which the reader is attached. Tags, inversely, receive RF signals from readers, react to the commands sent, and send RF signals back to the reader when commanded. Tags are often constructed from two parts: an antenna that receives and sends RF waves, and an integrated circuit or chip that carries out the functions of the antenna and contains its memory. The patents-in-issue in this case primarily concern tag technology.

A common RFID system will have one or more readers and one or more tags attached to objects. The tags usually contain information about the object to which they are attached. RFID systems are implemented in many ways. One of the simplest systems used is electronic article surveillance ("EAS") in which tags are attached to retail goods. Another is automated toll roads and bridges. Yet another is warehouse and manufacturing inventory systems that allow companies to automatically monitor the location, quantity, and status of objects. RFID systems have also been used to communicate information about animals and are now being used to carry information about people.

When a reader and tag are within range of each other, they communicate using RF signals. Readers can transmit either continuous waves (also known as carrier waves) or modulated waves to tags. A carrier wave is an RF wave at a constant amplitude, frequency, or phase. A modulated wave is one in which the reader has altered the amplitude (amplitude modulation or "AM"), frequency (frequency modulation or "FM"), or phase of the wave (phase modulation). Carrier waves are used to power tags. Modulated waves primarily communicate information to the tag in the form of a digital binary code. For example, in the case of frequency modulation, this is done by modulating the wave to two distinct frequencies, one that stands for "1" and another that stands for "0." Using this code, readers and tags can communicate complex strings of information to each other. Modulated waves also supply power to tags.

Tags often communicate with readers by using a technique called "backscatter modulation" or "backscattering." As a tag antenna receives an RF wave, the wave produces an electrical current in the tag. Circuitry within the tag will use that energy to reflect an RF signal. That signal can be modulated to embed information on it, also in the form of 1 or 0. The reader then receives, translates, and uses the backscattered signal. This process is similar to two campers communicating with each other using a flashlight and mirror. The first camper shines the flashlight toward the second camper. The second camper uses the mirror to reflect the light back to the first camper. The second camper can modify or modulate the light by tilting the mirror, turning the light on and off. Using a series of modulations, the second camper can send a coded message to the first.

Tags are categorized depending on how they are powered. "Passive tags" are powered solely by the RF signal they receive. As the RF signal makes contact with an antenna, an electrical current is produced in the antenna. The tag momentarily collects and then uses this energy to perform the command given. "Semi-passive tags" use the received RF signal to backscatter but also have an additional durable power source, such as a battery, to perform other functions. "Active tags" contain a power source, such as a battery, and are capable of performing internal functions and transmitting information in the absence of a reader-produced RF signal.

The electrical energy created in an antenna is alternating current ("AC"). However, a tag chip can only function on direct current ("DC"), so a conversion from AC to DC must be done. This is accomplished through a process known as "rectification" and performed in a circuit called a "rectifier." A rectifier is a

series of diodes, which will allow current to flow in only one direction, and a capacitor, which can temporarily store the electricity. Once the current passes through the diode, it is incapable of altering direction. The direct energy is stored in the capacitor and then proceeds through to the other circuits as DC energy.

Tags also contain memory that store information about the object to which it is attached. This memory is either read-only or read/write. Read-only means that once the information has been programmed on the tag, the data can be only read from and not added to. Read/write tags can identify themselves from the stored data, and additional data can be written onto the memory of the tag. Because of this, read/write tags are useful for tracking cargo shipments.

RFID systems can also be categorized as a reader-talk-first ("RTF") system or a "tag-talk-first" ("TTF") system. In an RTF system, communication between the reader and tag is initiated by the reader sending a modulated signal to the tag. In a TTF system, communication is initiated by the tag sending a modulated signal to the reader without a command from the reader. In other words, whether a system is RTF or TTF is determined by which part sends the first modulated signal. Whichever sends the first modulated signal is the part that "talks" first.

B. Procedural Posture

In June 2006, Alien sued Intermec, seeking a declaratory judgment of non-infringement or invalidity for a number of RFID patents. Intermec counterclaimed, claiming Alien's products do infringe the patents. Currently, seven patents remain in issue. The parties submitted construction briefs, supporting evidence, expert reports, and a joint construction chart, and on May 14-16, 2008, the Court held a *Markman* hearing. After the *Markman* hearing, the parties filed a revised joint construction chart, reflecting the agreements made and modifications requested during the *Markman* hearing. Now before the Court are the remaining disputed claims of the seven patents-in-issue.

II. Discussion

A. General Rules of Claim Construction

The construction of patent claims is a matter of law for the Court. Markman, 517 U.S. at 372. The Federal Circuit recently clarified the law concerning claim construction in Phillips v. AWH Corp., 415 F.3d 1303 (Fed.Cir.2005). When construing patents, the Court must initially consider intrinsic evidence of the claim's meaning. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996).

The Court first looks to the claim and the words of the claim, giving the words their plain meaning. Phillips, 415 F.3d at 1312. Plain or ordinary meaning is the meaning the term carries for "a person of ordinary skill in the art in question at the time of the invention." Id. at 1313. General purpose dictionaries can be helpful at this point. Id. at 1314.

Next, the Court considers the entire specification to define technical terms that may not lend themselves to an ordinary meaning. Id. at 1315. The specification must be examined so that the claims do not stand alone but are considered as part of one integrated instrument. *Id*. In *Phillips,* the Federal Circuit reaffirmed that " '[t]he best source for understanding a technical term is the specification from which it arose, informed, as needed, by the prosecution history.' " *Id*. (quoting Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1478 (Fed.Cir.1998)). If the inventor has acted as his or her own lexicographer and given a special

definition to a technical term, that definition is followed. Vitronics Corp., 90 F.3d at 1582. In *Phillips,* however, the Federal Circuit also reaffirmed what it has dubbed, " 'one of the cardinal sins of patent law-reading a limitation from the written description into the claims[.]' " Phillips, 415 F.3d at 1320 (quoting SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1340 (Fed.Cir.2001)). When interpreting a claim, the Court cannot read a limitation from the specification into the claim. Phillips, 415 F.3d at 1323. The court also acknowledged, "the distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice." *Id*. To avoid this problem, courts must remember patents are to be construed as a person of ordinary skill in the art would understand the claim. *Id*. The danger of limiting the patent to the embodiments disclosed in the specification can be avoided by reading the specification in that context. *Id*.

Intrinsic evidence also includes the patent's prosecution history. *Id*. at 1317. The prosecution history includes the prior art the applicant cites. *Id*. The Court must be mindful that the prosecution history lacks the clarity of the specification and is, thus, less useful. *Id*.

If the claim is still ambiguous after considering these sources of intrinsic evidence, the Court may look to extrinsic evidence such as expert and inventor opinions, technical dictionaries, treatises, and articles. *Id*. Extrinsic evidence is a last resort, however. Relying on extrinsic evidence when intrinsic evidence is sufficient to construe a claim is improper. Vitronics, 90 F.3d at 1584-85.

The Federal Circuit has also recently clarified when a district court must construe disputed language. In *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.,* the parties disputed the meaning of the phrase "only if." 521 F.3d 1351, 1357 (Fed.Cir.2008). The district court concluded that it need not construe the term and that "only if" " 'has a well-understood definition, capable of application by both the jury and this court in considering the evidence submitted in support of an infringement or invalidity case.' " *Id*. (quoting *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.,* No. 2:04-CV-32 (E.D.Tex. Aug. 26, 2005)).

The Federal Circuit concluded this was error because *Markman* compels a district court to construe a term when the parties present a dispute involving its meaning and scope. Id. at 1361. By not construing the phrase, the court left a decision on the dispute to the jury, which is improper under Markman. Id. at 1362. While the district court does not have to construe every limitation presented in a patent, the court held, "When the parties present a fundamental dispute regarding the scope of a claim term, it is the court's duty to resolve it." Id. at 1362.

B. U.S. Patent No. 5,528,222

Patent 5,528,222 ("'222 Patent") discloses a thin, flexible tag. If an RF tag can be small, thin, and flexible, it can be attached to numerous items that an inflexible tag could not be. The parties disagree on the meaning of six terms or phrases.

1. An antenna that is an *integral part of* the substrate (Claim 1) FN3

FN3. The disputed terms or phrases analyzed are those underlined. For completeness in the order, the Court will also include the stipulated constructions for terms or phrases the parties began the *Markman* phase disputing but on which they have now reached agreement.

The parties agree that "integral part of" means "affixed to or fused with." The parties dispute the meaning of

"the substrate" but wish to address that dispute in connection with the next claim element. The Court will do so.

2. A circuit chip ... being *on the substrate in adjacent proximity* to the antenna (Claim 1)

The first disputed term is the meaning of "substrate." Intermec proposes a general dictionary definition, "an underlying layer" (doc. 370-2, p. 39). Alien has submitted a more specific meaning, taken from a technical dictionary (doc. # 381, p. 11). The dictionary Alien cites to contains several definitions of substrate, the most relevant being "[t]he physical material on which a microcircuit is fabricated; ..." McGraw-Hill Dictionary of Scientific and Technical Terms 2061 (6th ed.2003). Both definitions contemplate the same idea that the tag needs some base layer on which to build circuitry. The Court is required to define terms as a person of ordinary skill in the art ("POSITA") would understand the term to mean. Phillips, 415 F.3d at 1313. The specification does little to add to the definition, but it does make clear that the substrate is the physical material to which the circuitry is secured. Alien's construction is drafted more precisely to this field. It explains the relationship between the substrate and the circuitry. Furthermore, Alien notes the substrate must be dielectric, or nonconductive, for an electrical circuit to work properly. This construction properly reflects what a POSITA would understand a substrate to mean. Therefore, the Court concludes "substrate" means, "a non-conductive material that serves as a platform upon which electronic circuitry is built."

The next disputed phrase is "on the substrate." The principle issue here is whether the chip must be directly supported by the substrate or whether indirect support is sufficient. Alien argues that direct support or a location within the substrate is required because the chip is connected to the antenna and the antenna is part of the substrate. However, the specification of the ' 222 Patent is not this exacting. Figures 2 and 3 show an antenna that is an integral part of but still divisible from the substrate. In addition to the antenna, Figures 2 and 3 show the chip's contacts (222, 322) and connecting bumps (225, 325) between the chip and the substrate. Therefore, to say the chip is directly supported by or within the substrate does not account for this separation. Therefore, the proper construction of "on the substrate" is "supported directly or indirectly by the substrate."

The final phrase of this disputed element is " *in adjacent proximity*." Both parties agree the specification is instructive for this phrase. However, each draw its emphasis to different words. Intermec argues "in adjacent proximity" means in close proximity, while Alien claims the phrase means the components are not stacked.

The specification is helpful when it comes to this phrase. At column 3, line 19, it states, "The elements of the package are placed adjacent to one another, i.e., they are not stacked." Column 4, lines 25-27 further states, "Further novelty of the invention includes arranging the components (chip and antenna and possibly a battery) in adjacent proximity to one another. This means that the components are close (i.e., not stacked)." Finally, at column 5, lines 38-40, the specification states, "The battery is placed adjacent to the chip, not stacked upon the chip.... The wiring is kept in one plane and all of the elements (chip, battery, antenna) are coplanar; there is no stacking." While Intermec correctly notes that "adjacent" typically means the objects are close to each other, in this instance the inventor used a special meaning for adjacent or close, that being "not stacked." The specification also teaches, "Thus all of the wiring is placed in a single plane. Keeping the antenna adjacent to the chip, avoiding cross-overs and stacking, also contributes to keeping the package thin." '222 Patent, column 4, lines 31-34 (hereinafter "4:31-34"). When an inventor gives a commonly understood term or phrase a special meaning and acts as his or her own lexicographer, the court must respect that definition. Phillips, 415 F.3d at 1316. Upon reading the ' 222 Patent's specification, it becomes

clear that this inventor intended to give "in adjacent proximity" its own meaning.

The Court disagrees with one part of Alien's proposed construction, however. Alien's construction incorporates the concepts of "not stacked" and "have a single metal layer" but then construes the term a third time with, "i.e., have no dielectric layer in between them." This pushes their meaning too far. While Alien may think the additional language adds specificity to its definition, the specification does not include this when defining "in adjacent proximity." Adding the language would go further than is necessary to give the phrase its intended meaning. Therefore, the Court construes "in adjacent proximity" as "not stacked, meaning the chip and antenna occupy a single metal layer."

3. Coplanar with (Claim 1)

For this term, the parties dispute whether the specification prohibits the use vias and crossovers to make the electrical connection between the antenna and the chip. As described in the '222 Patent, vias are "between-plane connectors through a dielectric layer." '222 Patent 4:20-21. Alien argues the inventors again defined the disputed term in the specification by stating, "The novel design has a single metal layer with no vias ... in the flexible continuous film. By using only one level of metal to produce the antenna and interconnections, the package is kept thin." However, coplanar is not a technical term, so even a lay person would be able to construe the term in its ordinary meaning. Phillips, 415 F.3d at 1314. When this is true, general purpose dictionaries may be helpful. *Id*. The general definition of "coplanar" is "lying or acting in the same plane." Merriam Webster's Collegiate Dictionary 276 (11th ed. 2007) ("Webster's"). As used in the specification, this meaning is consistent with the phrase coplanar. The inventor said as much when describing the components of the tag occupied one metal layer. This would be the same plane. Therefore, the plain and ordinary meaning of "coplanar with" should be applied, that being "lying or acting in the same plane."

4. Encapsulant (Claim 7)

The issue of the parties regarding "encapsulant" is how specific an encapsulant does the patent require. Alien argues the encapsulant is limited to "a chemically inert liquid with good dielectric properties placed over and around assembled electronic components to enclose and protect the electronic components when it hardens." (Doc. # 381, p. 19.) It contends this is the only method known in the art for encapsulating a circuit. *Id*. This is the technique used by the exemplary encapsulant disclosed in the patent, hysol epoxy. '222 Patent, 5:15-16. However, this limitation is not found in the specification. "Encapsulate" is a commonly understood word for which a general purpose dictionary may be helpful. Phillips, 415 F.3d at 1314. "Encapsulate" means "to enclose in or as if in a capsule." Webster's 410. Intermec's proposed construction is consistent with this concept. It also includes the one limitation taught in the specification: additional environmental protection. ' 222 Patent, 5:16-19. Therefore, the Court interprets "encapsulant" as "a layer of non-conductive material encasing electronic components to protect them from the environment."

5. Laminated by one or more layers (Claim 11)

Similar to encapsulant, the parties' dispute concerning "laminated by one or more layers" is over how specific a laminate the patent requires. The parties agree the specification does not define the term. However, Alien's construction, "covered with a non-functional cover layer that is bonded to the circuit using either a two layered material composed of an adhesive and an outer layer, or a single organic layer of material, under heat," is derived from the '222 Patent's reference to laminating. The specification states,

In a still more preferred embodiment, the package is sealed by thin flexible laminations 370 consisting of hot melt adhesive 350 such as EVA, phenolic butyral, or silicone adhesive on the inside and an outer coating 360 of a tough polymeric material (such as polyester, mylar, polyimide, and polyethylene) on the outside. In an alternative preferred embodiment, layer 370 comprises a single layer of organic material.

'222 Patent, 4:67-5:7. However, as the specification teaches, these are exemplary methods of how the embodiments shown in the specification can be laminated. Laminate is a commonly understood word for which a general purpose dictionary may be helpful. Phillips, 415 F.3d at 1314. Laminate means "to make ... by uniting superposed layers of one or more materials." Webster's 698. Intermec's construction reflects the plain and ordinary meaning of "laminated," that being "having a thin layer of material covering at least one surface." The Court accepts this construction.

6. Resonant antenna (Claim 18)

Claim 18 of the '222 Patent discloses a "resonant antenna." U.S. Patent 6,400,274 (the '274 patent) also addresses antennas and the scientific principle of resonance. Therefore, the parties agree that their dispute over the term resonant antenna should be addressed in connection with the '274 patent. The Court will do so, revisiting this term at the conclusion of its related analysis in the '274 Patent.

C. U.S. Patent No. 6,400,274

The '274 Patent discloses high-performance, mobile power antennas. It teaches a highly efficient and resonant antenna that will increase the operating abilities of an RF tag. The parties disagree on the meaning of six terms or phrases.

1. An antenna/antenna configuration (Claims 1, 2, 19)

The parties dispute what an antenna consists of as taught in this patent. Alien argues "antenna" and "antenna configuration" should be given their plain and ordinary meaning. Intermec argues that as used in this patent, "antenna" and "antenna configuration" are synonymous and include not only what one would normally think of as an antenna, the wire elements, but also the matching resonance circuitry. It contends "antenna" must include the matched circuitry because the goal is a resonant antenna and tag. Resonance is achieved through altering the impedance of a circuit, and for a tag to achieve resonance, the impedance of both the antenna and the circuit must be accounted for.

Impedance of a circuit is measured by adding the resistance inherent in every circuit to the reactance of the circuit. Resonance is achieved when the circuit's reactance is eliminated so the only impedance is the circuit's resistance. Intermec's argument is best illustrated through the example it used at the *Markman* hearing. Intermec's counsel compared achieving resonance in an antenna and circuit to duck hunting. When a duck is in flight, the hunter does not shoot where the duck presently is. The hunter must lead the duck and aim where it is going to be. The analogy holds true in football as well. When a quarterback throws to a receiver, he does not throw to where the receiver currently is. Instead he throws to where the receiver will be, allowing the receiver to catch the ball in stride. The analogy to this patent is that the inventor was not concerned with the resonance of the antenna alone but the resonance of the antenna and circuit as a whole. Rather than determine resonance of the antenna alone, the inventor had to "lead" the antenna to also include the impedance of the related circuit. Thus, Intermec argues, "antenna" and "antenna configuration" must include the related circuitry.

Intermec also points to the specification for support. It notes figures 1A-1D, 2A-2D, 3A-3D, and 4 all show wire antennas with circuitry (doc. 370-2, p. 52). The specification refers to these structures as antennas. '274 Patent, 2:45-61; *see also id.,* 2:66-67, 3:2-3, 3:5-6, 3:7-8, 3:13 (Figs.1A-1D); 3:17 (Figs.2A-2D); 3:22-23 (Figs.3A-3D); 3:29-31 (Fig.4). Intermec contends a POSITA would understand "antenna" and "antenna configuration" to be one component combining the wire antenna and matching circuitry.

However, as Alien notes, the specification distinguishes between what is an "antenna" and what is a matching circuit. The summary of the specification discloses "resonant antennas coupled to a half wave rectifier, a full wave rectifier, and a voltage multiplier." '274 Patent, 2:24-25. The specification also discusses the importance of a resonant antenna with a rectifier: "The combination of resonant structures and appropriate rectifying circuits result in antennas with high-performance powering capabilities." Finally, the claims themselves disclose an antenna that is resonant or substantially resonant at the carrier frequency and then claim the rectifiers discussed in the specification. Therefore, "antenna" and "antenna configuration" cannot mean the antenna with matching circuitry.

The Court concludes that both "antenna" and "configuration" are non-technical terms that a lay-person would understand and for which a general purpose dictionary is helpful. Phillips, 415 F.3d at 1314. The common dictionary meaning for "antenna" is "a usually metallic device (as a rod or wire) for radiating or receiving radio waves." Webster's 52. "Configuration" means "relative arrangement of parts or elements." Webster's 261. These are similar to Alien's proposed constructions (doc. # 453, p. 5), but both of Alien's constructions are somewhat flawed. First, for "antenna," Alien has used a technical dictionary to provide its definition (doc. # 346 (van der Weide Opening Expert Report), para.para. 96, 121-125 & Ex. M) (defining "antenna" as "[a] means for radiating or receiving radio waves")). While the difference between the two dictionary definitions may be semantical, *Phillips* clarified technical dictionaries are extrinsic sources, which should only be used when no intrinsic source will suffice, such as a general purpose dictionary for common terms. Phillips, 415 F.3d at 1318. Furthermore, Alien's definition of "antenna configuration" incorporates "excluding any circuitry that may affect the resonance of the antenna configuration." (Doc. # 453, p. 5). This language is Alien's own construction. It is not rooted in either the specification or a general meaning of the term. Therefore, while the Court does not disagree with Alien's logic, it would be improper to include this specific language in the construction.

The Court concludes the proper construction of "antenna" is "a device for radiating or receiving radio waves" and of "antenna configuration" is "an arrangement of elements that serve the function of an antenna."

2. Is *resonant* with the carrier frequency (Claim 19)

The parties agree the term "resonant" means "having an input impedance having a nonzero resistance component and a zero reactance component." The parties continue to dispute, however, which structures must be "resonant" and how resonance is determined. The parties will continue this debate in light of the Court's construction of other terms, but the Court does not need to offer any other construction.

3. Is substantially resonant with/at the carrier frequency (Claims 1, 2)

The dispute between the parties concerning this phrase is how specifically this phrase must be construed. Alien, relying on the specification at column 4, lines 2-14, suggests that "substantially resonant" means within +/2% of the resonant carrier frequency. At the *Markman* hearing, the Court expressed its hesitation that this definition was far too limited, and Intermec agreed. However, Alien argues that Intermec's

construction, which refers only to an operational amount of RF energy over a range of frequencies, is too broad. The Court agrees, because, generally speaking, a tag can generate some amount of operational energy at a broad range of frequencies, which would not make it "substantially resonant."

During the *Markman* hearing, the parties submitted alternative proposals trying to bridge the gap between the two constructions (doc. # 453, p. 6). The new proposals are quite similar. However, Alien objects to Intermec's proposal because it does not include the concept of the carrier frequency, and Intermec objects to Alien's proposal as being overly wordy and cumbersome.

As discussed above, resonance is the point where reactance is zero and the only impedance of the circuit is its resistance. Within the world of RF waves, resonance is achieved at a particular mean or median carrier frequency within an operating band. '274 Patent, 4:5-10. Graphically represented, the resonant frequency would be a vertical line or spike on a horizontal line that represents the operating band. The goal is to find a narrower range of frequencies surrounding the resonant spike where the circuit will operate efficiently. Therefore, the concepts of a narrow range of frequencies, the operating band or range, and the carrier frequency all play a part in defining "substantially resonant at the carrier frequency." Therefore, the Court, relying on both parties' proposed alternative constructions, construes the phrase to mean, "has an input impedance that is nonreactive at a frequency within a narrow operating range of frequencies surrounding the carrier frequency."

4. A modulation circuit that *shorts and opens the antenna terminals* at a *modulation frequency* in order to *change the antenna impedance* (Claims 2, 19)

This phrase describes how a tag backscatters a modulated frequency to communicate back to a reader. As discussed above, when a tag receives a carrier signal, it can reflect some of that signal back to the reader through a modulated RF wave, sending an encoded message to the reader. Reflecting the wave is done with a circuit that uses shorts and opens at the antenna terminals to change the antenna's load impedance to vary the signal strength sent back through the antennas to the reader.

The first phrase in need of construction is "shorts and opens the antenna terminals." A "short" is a connection between two parts of a circuit that allows current to flow through it. McGraw-Hill Dictionary of Scientific and Technical Terms 1921 (6th ed.2003). An "open" circuit prohibits a current from flowing through it because of a break, obstruction, or interruption in the path. *Id*. at 1476. The parties dispute how the short and open must be accomplished and how much of a short is required, a partial short or a nearly complete one. Alien argues Intermec's proposed construction of "electrically alters the connection between the antenna terminals" (doc. 370-2, p. 56) is too broad. It could include as little as a one-percent change in impedance. Arguably, even in a partial short, this would be too little change in impedance for a successful backscatter modulation. Conversely, Intermec argues Alien's construction fails to recognize that shorts can be partial and done with a capacitor whose connection is never removed.

The specification provides some guidance here. It states, "Modulation of the antenna reflectance characteristics to send signals from the tag to the base station may be performed by modifying the bias conditions on one or more of diodes 112, 114, 118, 120, or by shorting out capacitors 116, 122, and/or 124 under control of the tag electronic circuitry." '274 Patent, 5:11-16. Therefore, even if the Court chooses Alien's construction, it could not be read to exclude capacitors or diodes because the specification directly acknowledges they can be used to create a short or open. Furthermore, because of this specification language, Alien recognizes in its brief a literal meaning of short and open is improper (doc. # 381, p. 27).

Alien also recognizes the claim is not limited to the embodiment shown in Figure 6 (*id*. at p. 29). Therefore, the Court agrees Alien's construction accurately describes a short and open.

However, Alien's proposed construction does not allow for a partial short because it states "all or nearly all of the current flowing from the antenna terminals flows through the low resistance electrical connection across the antenna terminals." This would be improper because the claim's import is to establish sufficient current to backscatter modulate. Therefore, the Court concludes "shorts and opens the antenna terminals" means "alternately establishing and removing a low impedance electrical connection across the antenna terminals, such that in the shorted state, nearly all of the current flowing from the antenna terminals flows through the low impedance electrical connection across the antenna terminals."

The parties agree the next phrase, "modulation frequency," means "the specific rate at which the modulation circuit encodes data." Likewise, the parties agree "change the antenna impedance" means "alter the current flowing in the antenna in order to alter the reflectance of the antenna."

5. Develop a voltage sufficient to power an electric circuit (Claims 1, 2, 19)

The importance of this element of claims 1, 2, and 19 is that the tag be powered up quickly. The goal is to use a combination of antenna, rectifiers, and capacitors sufficient to power the tag within one modulation period. The dispute over "develop a voltage sufficient to power an electric circuit" is whether the voltage developed must power only an electric circuit or make the tag fully operational. Intermec argues for "an electric circuit" because that is what the claim says. Alien argues the tag must be operational, so any individual sub-circuit of the tag's chip is insufficient. However, at the *Markman* hearing, neither side disputed more is needed than just a power supply for "an electric circuit," meaning only a sub-circuit of a tag. The parties agree that the tag needs to work. Otherwise, the two proposed constructions are quite similar.

The parties also dispute what word should used to describe "develop." One synonym for "develop" is "acquire." The Court concludes that Intermec's use of "accumulate" is consistent with the claim's use of "develop." The Court concludes "develop a voltage sufficient to power an electric circuit" means "accumulate a rectified voltage sufficient to power the tag."

6. The voltage being developed within one period of the modulation frequency (Claims 2, 19)

The difference between the parties on this phrase is how to describe the voltage. As discussed above, modulation is the altering of the amplitude or frequency of an RF wave. Modulation is used to embed a message in the wave so that the unmodulated part of the wave may stand for "1" and the modulated part of the wave may stand for "0" when received by the reader. One modulation period is one pair of modulated and unmodulated portions of the wave. A tag that can power up in this brief period is significantly more efficient than one that cannot.

Alien's proposed construction includes unnecessary verbiage. It restates the element's limitation of a capacitor and the previously defined "develop ..." phrase. This is unnecessary for the meaning of this portion of the claim element. Therefore, the Court concludes the plain and ordinary meaning of "the voltage being developed within one period of the modulation frequency" is "the voltage is accumulated within one period of the modulation frequency."

7. '222 Patent **Resonant antenna (Claim 18)**

The Court now returns to the "resonant antenna" element of Claim 18 in the ' 222 Patent. The Court agrees with the parties that the definitions must be consistent between the two patents. Therefore, drawing from its analysis of the antenna and resonant limitation in the '274 patent, the Court construes "resonant antenna" as "an antenna having an input impedance having a nonzero resistance component and a zero reactance component."

D. U.S. Patent No. 5,030,807

Patent No. 5,030,807 ("the '807 Patent") discloses an improved method from reading data from and writing data to a tag. As discussed above, RFID systems can be RTF or TTF, which is determined by which device sends the first modulated signal. The "handshake" is the process by which the reader and tag identify one another. However, the signal power needed to read a signal from a tag is less than the power needed to write data to the tag. Therefore, the patent also provides that before the reader sends a write signal, it will receive verification from the tag that it is within range to write. This improves the communication in that the reader does not waste time sending write signals to tags that are incapable of writing the data.

At the *Markman* hearing, the parties disputed eight different limitations of the patent. After the *Markman* hearing, the parties disputed only two limitations. They concern what kind of tag the system implements and whether the system is RTF or TTF.

1. Remote object (Claims 1, 4)

Claims 1 and 4 use the term "remote object." Generally understood, "remote object" is what is commonly known as a tag. However, the parties dispute whether or not the tag has a battery, making it semi-passive. Alien contends the invention is limited to a semi-passive tag that contains a battery. Intermec disagrees, arguing the tag does not have to have a battery but may be completely passive.

The Southern District of California has previously interpreted this patent and limitation. In *Single Chip Systems Corp. v. Intermec IP Corp.,* the plaintiffs and co-defendants, Transcore, LP and Transcore Holdings, Inc., disputed the meaning of "remote object." No. 04CV1517 JAH(BLM), Claim Construction Order at 6 (S.D.Cal. Apr. 14, 2006) ("SCS"). In *SCS,* the district court was presented similar arguments on the proposed construction of "remote object." Using the doctrine of claim differentiation, the court compared the "remote object" of claim 1 in light of claim 2's limitation of "said remote object being continuously capable of backscatter-modulating received RF signals with its stored data even when no RF signal is being received from said interrogator." *Id.* at 10-11. The court concluded "remote object" meant "an *object with an electronic circuit capable of receiving an RF signal, back-scatter modulating and transmitting the signal to an interrogator to* indicate the identity of the remote object." *Id.* at 12 (emphasis in original).

As the *SCS* court did, the Court must consider the doctrine of claim differentiation in order to construe these terms. Generally, the doctrine of claim differentiation dictates that different words used in separate claims means the claims have different meaning. Seachange Int'l, Inc. v. C-COR, Inc., 413 F.3d 1361, 1368 (Fed.Cir.2005). The Federal Circuit has stated the doctrine is strongest when the added limitation to an independent claim already exists in a dependent claim. Id. at 1368-69 (citing Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed.Cir.2004)). However, the doctrine also applies when two independent claims have different words, presuming the claims have a different scope. Id. at 1369. The presumption is rebuttable, and the doctrine of claim differentiation cannot broaden a claim beyond its correct scope. *Id.* The

Federal Circuit has warned, " 'claims that are written in different words may ultimately cover substantially the same subject matter.' " *Id*. (quoting Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1480 (Fed.Cir.1998)).

Claim 1 is an independent claim that discloses, "A system for identifying, for writing data into, and reading data out of remote objects which may be in motion relative to the interrogator, ..." '807 Patent, 9:39-41. Claim 2 depends from claim 1 and discloses, "The system for identifying, for writing data into, and reading data out of remote objects of claim 1 further characterized by said remote object being continuously capable of backscatter-modulating received RF signals with its stored data even when no RF signal is being received from said interrogator." *Id*. 9:61-66. Therefore, at first glance, it would appear claim 2 adds a limitation that requires a battery so the remote object may continuously backscatter modulate. However, as Alien noted during the *Markman* hearing, the parties in *SCS* stipulated that a remote object continuously capable of "backscatter-modulating" as used in claim 2 meant the same as a remote object that "continuously scrolls through the data in its memory" as the specification teaches. *E.g., Id*. 3:32-34 ("Unlike the tags of the prior art, the tag of the invention continuously scrolls through the data in its memory."). This begs the question of whether backscatter modulating and scrolling through memory are truly the same concepts.

The specification gives good detail on this point. As cited above, the specification describes the tag of the invention itself as scrolling through its memory. *Id*. 3:32-34. The specification also teaches, "The remote object is continuously powered for backscatter-modulating received RF signals even when no actual RF signal is being received." As discussed above, backscatter modulating is a system a tag uses to communicate with a reader. A constantly scrolling memory is a memory that is continually processing, and for the ' 807 patent, it is continuously scrolling its identity. As Alien described it at the *Markman* hearing, a continuously scrolling memory is like the news crawl at Times Square. When the tag comes to the end of its memory, it automatically loops around again, and again, so that it always stands ready to communicate its identification to a reader. A continuously scrolling memory is not the same as being capable of backscatter modulating, which relates to the communication of the memory rather than the memory itself. Therefore, the Court concludes the doctrine of claim differentiation is not dispositive because claim 2 describes a tag that is continuously capable of backscatter modulating while claim 1, as discussed above, defines a tag with a battery but does not contain the modulating limitation.

To be certain, both a continuously scrolling memory and a continuous capability of backscatter modulating are important features for the '807 tag to meet is goal, namely a more efficient communication system for reading and writing data. Furthermore, both features require a battery, as the specification teaches. First, "The remote object is continuously powered ... even when no actual RF signal is being received." *Id*. 3:8-10. Furthermore, the specification teaches that because the remote object can gather energy from the closer-range write signals, which requires more energy, the drain on the battery during write periods is not as great. *See id*. 8:36-39 ("Since the increased operating current is on only for short periods of time during a WRITE operation, there is very little penalty in tag battery life."). Thus, the remote object of the invention, as opposed to a mere embodiment, must contain a battery.

Intermec's arguments that this result imports an embodiment limitation into a claim not present in the claim is misplaced. The specification does not refer to either the continuously scrolling or continuous backscatter modulating capabilities as embodiments but rather features of the invention. '807 Patent, 2:21-25 ("The system of this invention considerably lessens this handshake delay by employing a tag which continually indicates its own identity, even in the absence of any interrogating command signal from the interrogator."); 2:57-60 ("the system of this invention ... employs an interrogator for sending an RF signal to the remote

object.... The remote objects are capable, upon receipt of the transmitted RF signal, of backscatter-modulating that RF signal and returning a signal which is backscatter-modulated with data indicating the identity of the remote object."); 3:8-10 ("The remote object is continuously powered for backscatter-modulating received RF signals even when no actual RF signal is being received."); 3:32-34 ("Unlike the tags of the prior art, the tag of the invention continuously scrolls through the data in its memory.").

Therefore, the Court concludes "remote object" means a "battery-powered RFID tag."

2. Upon receipt of said RF signal (Claims 1, 4)

The parties' dispute over this limitation involves how quickly the tag must backscatter-modulate to the reader. Intermec argues it need only be some point soon after receipt. Alien argues the construction must be "as soon as" to represent an immediate response, even in the absence of a wake-up or command signal. At the crux of this argument is whether the '807 Patent involves a combination RTF/TTF system, as Intermec contends, or a TTF-only system, as Alien argues.

An examination of the '807 Patent's discussion of the prior art is helpful. The '807 Patent's specification discusses U.S. Patent No. 4,390,880 ("the Henoch Patent"). '807 Patent, 1:58-2:20. The Henoch Patent discloses an RFID system where the reader sends an " 'interrogation command signal' " that tells the tag to transmit its identifying data. *Id*. 1:60-67. After receiving the tag's response, the reader sends the tag a " 'key signal' " to open its write operation. *Id*. 1:67-2:1. Because the interrogation command signal orders the tag to respond with its identifying data, the signal must be modulated, meaning the reader has talked first. Thus, as the parties agree, the Henoch patent teaches an RTF system.

The '807 Patent, however, "considerably lessens this handshake delay by employing a tag which continually indicates its own identity, even in the absence of any interrogating command signal from the interrogator. No interrogation command signal is transmitted by the interrogator to enable reading of the tag. The tags of the subject invention use a continuously scrolling fixed code to transmit their identity." Id. at 21-28. "Accordingly, the technique used in this invention substantially speeds up reading and writing, greatly increasing the maximum operational range." Id. at 39-42.

This is a clear distinction of the prior art from the '807 Patent. The ' 807 patent, by continuously scrolling its memory and being continuously capable of backscatter modulating, can immediately report its identification once it is within range of a reader's carrier signal. Therefore, the tag sends the first modulated signal and is, thus, a TTF system. The immediacy of the signal is disclosed in the specification. "As soon as the tag comes within range of the transmitted RF signal from an interrogator, the tag will backscatter-modulate the signal from the interrogator, in sequence, with the two 128-bit code frames. These will then be received and interpreted by the interrogator, as shown in step 10 of FIG. 1. Assuming the tag is a proper one, the interrogator will recognize the tag's ID signal as valid." Id. 3:48-55. Therefore, the Court concludes "upon receipt of said RF signal" means "as soon as the tag receives an RF signal."

3. Selectively transmitted to and received and stored by* a remote object *only after such remote object has been identified as the correct remote object to receive such data (Claims 1, 4)

The first disputed claim of this element is "selectively transmitted to and received and stored by." At the *Markman* hearing, the parties agreed "selectively transmitted to" means "transmitted for receipt and storage by an identified remote object"; "selectively ... received" means "the data transmitted for receipt and storage by an identified remote object is received and accepted by that remote object"; and "selectively ... stored by"

means "the data transmitted for receipt and storage by an identified remote object is copied into a data field in long-term memory."

The final disputed claim of this limitation is "only after such remote object has been identified as the correct remote object to receive such data." At the *Markman* hearing, the parties agreed it means "transmit data to be written to a tag only after the tag has identified itself to the interrogator, and the interrogator has determined that the tag is the proper tag to receive the data."

4. Said backscatter modulated signal being modulated with data indicating ... [the remote object's] ability or inability to receive and store transmitted data from said interrogator (Claim 4)

At the *Markman* hearing, the parties agreed this limitation means "the backscatter-modulated returned signal from that object indicates its ability or inability to receive and store transmitted data."

5. Transmit[ting] data to said remote object only if ... said backscatter modulated returned signal indicates the ability of said remote object to receive and store transmitted data (Claim 4)

At the *Markman* hearing, the parties agreed this limitation means "the reader will send data to the tag only if the tag indicates to the interrogator that it is able to receive and store the data to be sent by the reader."

6. Sensing the strength of the received RF signal (Claim 6)

At the *Markman* hearing, the parties agreed this limitation means "detecting the strength of the received RF signal."

7. Determining whether or not it is adequate for data accurately to be written into said remote object (Claim 6)

The parties agree the interpretation of this term depends upon the interpretation of the prior claim term- "sensing the strength of the received RF signal." Because the parties have now stipulated to the meaning of "sensing the strength of the received RF signal," the Court will not construe this term.

8. And indicating this ability to said interrogator (Claim 6)

The final disputed claim of the '807 Patent is the last phrase in claim 6, which states "and indicating this ability to said interrogator." The parties' constructions, while worded differently, are similar in the concept they express.

The context of claim 6 provides sufficient information to interpret the claim. It states:

The system for identifying, for writing data into and reading data out remote objects of claim 4 further characterized by said remote object determining its ability to receive and store transmitted data by sensing the strength of the received RF signal and determining whether or not it is adequate for data accurately to be written into said remote object, and indicating this ability to said interrogator.

'807 Patent, 10:41-48. In other words, after the tag senses that it has sufficient signal strength for a write command, it communicates this ability to the interrogator. Therefore, the Court concludes the plain meaning of "and indicating this ability to said interrogator" is "indicating to the interrogator whether the RF signal

level is strong enough for the interrogator to write data."

E. U.S. Patent No. 6,812,841

Patent No. 6,812,841 (the '841 Patent) discloses a tag that contains a "state holding cell" to remedy the problem encountered when a tag moves out of a reader's range in the middle of a communication between the two. '841 Patent, 2:28-35. Quite often, a passive tag is moving while communicating with the reader. If the tag moves out of the reader's range in mid-communication, the tag loses power and resets back to its original state. *Id*. 1:55-59. Once power is restored, the reader must repeat the commands and duplicate the work already done between the two. *Id*. 2:10-12. The state holding cell stores information about what state the tag was in before the loss of power and restores the tag to that state when power is returned. 2:28-35. The parties dispute seven limitations in the '841 Patent.

1. Said analog circuit *providing state information defining a desired state of said RFID transponder* (Claims 1, 9, 21)

The parties have agreed that "providing" in this patent means "to supply for use or make the state information available for use." The next term within the disputed phrase is "state information." Alien argues the term should be limited within the full disputed phrase to operating states. Intermec counters that nothing limits the state information that can be stored in the state holding cell to information about operating states.

At the outset, the Court notes the claims are silent on what kind of state may be maintained as state information. Alien points to the specification's discussion of states to support its argument. The specification states, "Exemplary states for the RFID tag 10 include: (i) ready state, when the tag is first powered up; (ii) identification state, when the tag is trying to identify itself to the RFID interrogator; and, (iii) data exchange state, when the tag is known to the RFID interrogator and is either reading data from memory or writing data to memory." '841 Patent, 4:22-27. The three states described are all operating states. Therefore, Alien argues that a POSITA at the time of the invention would have understood that "state" was limited to operating states, and thus, "state information" is limited to information about operating states.

However, the very next line of the specification states, "Other tag states may also be included," and, "The state determines how a given command is executed by the RFID tag 10." 4:27-29. The plain meaning of this description is the inventor thought information about states, whether operating or otherwise, could be stored. The second phrase cited, "[t]he state determines how a given command is executed by the RFID tag 10," is true no matter what kind of state is at issue. Furthermore, the specification expressly provides the described states are only examples. Therefore, nothing in the specification or claims limits state information to operating states.

Alien also argues claim 8, which uses the phrase "plural operating states" necessarily limits claim one only to operating states. '841 Patent, 7:5-7. However, this would violate the doctrine of claim differentiation, which presumes words or phrases used in different claims have distinct meanings. Seachange Int'l, 413 F.3d at 1368. This presumption is strongest where the desired limitation to an independent claim appears in a dependant claim. Id. at 1368-69 (citing Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed.Cir.2004)). Claim 1 only references a state. Dependant claim 8 adds two limitations, plural and operating. Nothing presented in the intrinsic evidence rebuts the presumption that state should be construed differently from operating state. To practice claim 8 of this patent, the tag must be capable of defining plural operating states.

Therefore, the Court concludes "state information" means "information that can be used to determine the output of a digital state machine." Because state information is not limited to operating states, the proper construction of the disputed phrase as a whole is as Intermec suggests: "information obtained that determines the output of the digital state machine."

2. Corresponding to said analog signals (Claims 1, 9, 21)

The parties' dispute over this phrase stems from the meaning of "corresponding." "Corresponding" is a non-technical term that a lay-person would understand and for which a general purpose dictionary is helpful. Phillips, 415 F.3d at 1314. The common meaning of "corresponding" is "having or participating in the same relationship" and is synonymous with "related." Webster's 280. Therefore, the Court construes "corresponding to said analog signals" to mean "related to the analog signals."

3. Maintain said state information during a loss in power provided by said power capacitor (Claims 1, 9, 21)

While the parties dispute the meaning of this limitation, they have agreed their dispute will turn on the Court's construction of "state information." Having analyzed the meaning of "state information," this claim term need not be separately construed.

4. a *state holding cell* coupled to said *digital state machine* and being adapted to maintain [maintaining] said state information during a loss in power (Claim 1)

At the *Markman* hearing, the parties agreed "state holding cell" means "an electronic circuit structure for holding state information." Furthermore, the parties have agreed the term "digital state machine" need not be construed by the Court because there is no dispute that Alien's tags contain a digital state machine. Therefore, no further analysis of the limitation is necessary.

5. Defines plural operating states (Claims 8, 13)

Claim 8 is dependant on claim 1 and narrows the concept of state information. It adds the concept that the state holding cell is capable of defining multiple operating states. This claim is specifically limited to operating states, whereas claim 1 included all states. "Plural" is a non-technical term that a lay-person would understand and for which a general purpose dictionary is helpful. Phillips, 415 F.3d at 1314. The common meaning of "plural" is "relating to, consisting of, or containing more than one or more than one kind or class" or in other words, more than one. Webster's 955. Thus, the plain meaning of "defines plural operating states" is "may define more than one operating state."

6. Means for maintaining said state information in the RFID transponder's state holding cell when the state machine is not receiving power from the interrogating RF signal (Claim 9)

This element of claim 9 is a means-plus-function limitation. Means-plus-function limitations are provided for under 35 U.S.C. s. 112, para. 6:

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.

Section 112, para. 6, allows an applicant to protect a structure that performs a specific function without specifically describing every part of the structure in the claim. 2 John Gladstone Mills III et. al., *Patent Law Fundamentals* s. 14:36 (2d ed.2007). However, in order to take advantage of this shortened form, the applicant is limited to the structure's description in the specification. *Id.; see also* Halliburton Energy Servs., Inc. v. M-I LLC, 514 F.3d 1244, 1256 n. 7 (Fed.Cir.2008)("For so-called means-plus-function limitations, claim scope is limited to structure disclosed in the specification and equivalents.").

In a means-plus-function analysis, the Court must first identify what function is to be performed. Cardiac Pacemakers, Inc. v. St. Jude Med., Inc., 296 F.3d 1106, 1113 (Fed.Cir.2002). The function can only include the limitations contained in the claim language. *Id.* After identifying the function, the Court must identify the "means" or structure that carries out the function. *Id.* The structure must perform the function, and the specification must clearly associate the two. *Id.*

The function taught in the element is maintaining the state information even during a loss of power. Synonyms of "maintaining" are "sustaining" or "preserving." Webster's 749. The more difficult task is discerning from the specification what circuitry is needed to perform this function.

Column 4, line 60 through column 6, line 10 of the specification discusses the relevant structure. The specification states that Figure 3 of the '841 Patent is an exemplary state holding cell. Thus, the inventor acknowledged there could be other means of practicing the patent other than what is expressly listed. Therefore, the Court must examine the specification carefully to find the structure associated with the function.

Figure 3 illustrates a state holding cell that uses an OR gate (26), a diode (28), a capacitor (32), an operational amplifier (36), and perhaps a latch (34). The diode allows the current to pass in only one direction, towards the capacitor.

The capacitor stores the electrical charge delivered to it. This stored electrical charge is the "state information." In the event of a power loss, the electrical charge is passed on to the operational amplifier, which is used as a voltage comparator. '841 Patent, 5:50. The value of the voltage is compared to the voltage of the VREF. *Id.* 5:5-12. Depending on this and the values the OR gate receives, the tag resets itself to the appropriate state. While all these components play a part in the state holding cell, only two "maintain" the state information: the diode and the capacitor. The diode allows the current to flow only to the capacitor and prevents it from leaking in the reverse direction, and the capacitor physically stores the charge. The other components are used for communicating and translating the stored charge to the rest of the tag, but they do not "maintain" the charge, i.e., the state information.

This is further supported by the specification's discussion of how long the state holding cell can store the state information. "The duration of time that the state holding cell will maintain the previous state information will be determined by the leakage characteristics of the *capacitor* 32 and other parasitic elements of the circuit." *Id.* 5:38-42 (emphasis added). The state information can only be maintained as long as the capacitor will allow.

Therefore, the Court construes "means for maintaining said state information in the RFID transponder's state holding cell when the state machine is not receiving power from the interrogating RF signal" as "a capacitor coupled to a diode and equivalents thereof."

7. Wherein said maintaining step further comprises *receiving a voltage corresponding to said state information,* (Claim 22)

Claim 22 depends from claim 21, which teaches a method of operating a tag. Claim 22 discloses that the state information is actually a voltage received in the state holding cell, which corresponds to the state in which the tag is. Intermec contends Alien's proposed construction, "receiving said state information in the form of a voltage," is facially inaccurate because information does not take the form of voltage; the voltage stands for the state information and must be translated.

As stated above, claim 22 depends from claim 21 and its maintaining element. To maintain the state information, the state holding cell receives some voltage and maintains it in one or more capacitors. The voltage then continues on through the circuit and is translated into information about the state. As Intermec points out, the voltage means nothing without proper translation. Furthermore, as seen from claims 1, 9, and 21, the voltage received corresponds or is related to a tag state. Claim 22 teaches a process by which the tag receives an analog signal that is related to a state. Therefore, the proper plain meaning of "receiving a voltage corresponding to said state information" is "the voltage corresponding to the output of the digital state machine is stored within some capacitor(s)."

F. U.S. Patent Nos. 5,828,318 **and** 6,812,852 FN4

FN4. Because Patent Number 6,812,852 is a continuation of Patent Number 5,828,318, the two have nearly identical specifications and similar claim language. Therefore, they will be analyzed together. Cites to the specification will be made only to the '318 Patent.

Quite often, one or more readers, or "masters" as the patents use, must communicate with many tags, or "slaves" as the patents use. Some tags may be in motion, some may be stationary, but often the reader and associated computer system will have to sort the tags to isolate only a subset of the tags. Patent No. 5,828,318 ("the '318 Patent") and its continuation Patent No. 6,812,852 ("the '852 Patent"), teach a system in which a plurality of slaves can be selected or sorted into subsets using the states of the tag and complex, conditional logic commands the reader gives to the tags. '318 Patent, 3:8-18. The parties dispute five limitations of the patents.

1. State(s) ('318 Claims 1, 11, 17, 18; '852 Claims 1, 11, 15, 18, 19)

The most fundamental disagreement between the parties is what kind of states are involved and how are they used. Alien argues that "state," as used in this patent, has the same meaning as "selection state," and the selection state's sole function is to select a subset of tags. Intermec disagrees, contending a POSITA would consider a "state" and "selection state" to be two different concepts. Intermec also argues a selection state does not have to be exclusively for selection but can be any state that is used during a selection process.

Conceptually, tags use finite state machines to process commands. "Finite state machines" and "states" are well known terms of art. '318 Patent, 1:54-58 ("Finite state-machines are a well-known modelling [sic] tool. The set theory that often accompanies the definition of finite state-machines is also well known. Both subjects are amply covered in any of many books on discrete or finite mathematics that are available today."). The state is the conceptual behavior of the tag as it responds to the commands of a digital state

machine. In other words, what action the tag performs depends on the state it is in. As discussed in the '841 patent, one common category of state is an operating state that controls what the tag is doing. The '318 and '852 patents discuss "selection states" that are used in the selection process disclosed in the '318 and '852 patents.

As it did with the '807 Patent, the Court must consider the doctrine of claim differentiation in order to construe these terms. In the '318 Patent, Claims 1, 11, 17, and 18 are all independent claims. However, only claim 1 refers to "state" or "states"; claims 11, 17, and 18 disclose "selection states." In the '852 Patent, all the claims use "state" or "state"; "selection state" is not used in the '852 Patent. Therefore, the doctrine of claim differentiation creates a presumption that "state" and "selection state" have distinct meanings.

Alien makes a compelling rebuttal argument, however. The entire specification for both patents, approximately forty-seven pages worth of description and illustration, discuss a system for selecting a subset of tags. *See, e.g.,* ' 318 Patent, 3:8-10 ("The present invention is a system and method for selecting a subset of a plurality of autonomous and independent slaves, ..."). The states are described as "a three-state machine dedicated to selection," *id*. at 3:10-11, or, "The three states are dedicated to the process of determining whether a slave satisfies an arbitrarily complex condition." *Id*. at 6:45-47. In this sense, the patent certainly is about selecting a subset of tags.

However, the Court cannot ignore that the claims are phrased differently. Claim 1 of the '318 patent uses the term "state." Claims 11, 17, and 18 use the term "selection state." The claims of the '852 Patent, which of course came after the '318 Patent and its use of selection state, use only the term "state" and not "selection state." As explained above, this difference of usage suggests a different meaning.

Furthermore, the prosecution history shows a difference between the two terms, not a rebuttal of the doctrine of claim differentiation. When the inventor applied for the '318 Patent, the claims were quite similar to those eventually disclosed in the '852 patent (doc. # 371-5 & 371-6). However, these claims were rejected as being obvious in light of the Smith and Chang patents (doc. # 371-7). The application was amended to include the claims as approved in the '318 Patent, and the new application changed claims 11, 17, and 18 to include "selection states" (doc. # 371-8). Later, the '852 patent was approved using similar claims as were originally applied for in '318, which use only "state." The fact that the '318 was patentable only after inclusion of "selection" whereas the '852 patent did not need this inclusion suggest the terms have different meanings. The doctrine of claim differentiation mandates the Court respect the different meanings intended by the use of different words. Furthermore, the specification is insufficient to rebut this presumption in light of the prosecution histories' different usage. Therefore, "state" cannot be synonymous with "selection state." The Court construes "state" to mean "the configuration of information in the form of a finite state machine, which defines the condition of the tag."

2. Selection state ('318 Claims 11, 17, 18)

"Selection state," as used in the '318 Patent, is a different term, which the specification is helpful for defining. The specification is clear that a selection state is related to a "a three-state machine dedicated to selection, ..." '318 Patent, 3:10-11. The three-state selection machine is dedicated to selection. *Id*. 3:28. "Dedicated," even though used in the specification rather than the claim, is a non-technical term that a lay-person would understand and for which a general purpose dictionary is helpful. Phillips, 415 F.3d at 1314. The common meaning of "dedicated" as used in this context is "to set apart to a definite use." Webster's 324. Therefore, Intermec's proposed construction of "any state of the state machine that is used during the

process of selecting a tag" ignores that the specification teaches the selection state is "dedicated" to selection. Therefore, the Court construes "selection state" to mean "the condition of a finite state machine whose sole purpose is to isolate desired subsets of slaves from a set so that they may further communicate with a master."

3. *Each of the commands [each command* in the *selection criterion command sequence] specifying* a " *transfer from state* " [a " *from* " state], a " *transfer to state* " [a " *to* " state], and a *primitive [selection] condition* ('318 Claims 1, 11, 17, 18; '852 Claims 1, 11, 18, 19)

This element concerns what information must be in the command sent from the reader to the tag to cause a state switch. The dispute between the parties is how much information must be included in the command sent. Alien contends the command must contain the from state, the to state, and the primitive condition. Intermec argues the command can be shorter because the tag can have programing that makes the switch deterministic.

The Court starts, as the parties did, with the definition of "specify." "Specify" is a non-technical term that a lay-person would understand and for which a general purpose dictionary is helpful. Phillips, 415 F.3d at 1314. "Specify" has several meanings, the first being "to name or state explicitly or in detail." Webster's 1198. However, as Intermec notes, some dictionaries have defined "specify" as "to make specific: give a specific character or application to ... to speak precisely or in detail." Webster's Third New International Dictionary 2187 (1986). As Intermec concedes and contends, the first supports Alien's construction, the second supports its contention. Intermec argues, therefore, that the tag may make the transitions without the command including that part as long as the tag contains a deterministic state machine with stored state transition tables.

The specification also discusses the command in some detail. In the summary of the invention, the specification states:

A command specifies a desired transition, say from the second state to the first state. Only slaves that are at the second state may be affected. The command also specifies a condition under which the transition will occur. If the condition is met, the transition is effected; if not, the slave remains in its previous state.

'318 Patent, 3:36-41. This broad statement of the invention includes the from state and to state. The specification also states, in describing the figure that illustrates the command:

The simplest form of command is illustrated in FIG. 11. Command 1110 comprises three parameters. First, the 'from' state 1101; second, the 'to' state 1102; and third, the primitive condition 1112 which must be satisfied for the transition to happen. Those three parameters are named Si, Sj, and s, respectively in the figure. Si, the 'from' state 1101, and Sj, the 'to' state 1102, can be any of the three states 401, 402 or 403, except that Si and Sj are not equal.

Id. 8:3-10. Intermec correctly notes that figure 11 is one possible embodiment, but the specification provides many complex command sequences in figures 18-20, 26-27, 29-30, 35-36, 32-33, and 39-40. All teach command transfers that expressly state the from state, the to state, and the primitive condition.

Furthermore, not only do these figures show embodiments of transitions, they are the complicated transitions for which this patent expresses novelty. See ' 318 Patent, 2:11-13("not all complex conditions can be

effected with such two-selection-state machine."); 2:27-28 ("In the prior art, conditions such as the EXCLUSIVE-OR must be broken up into two independent processing steps."); 6:13-19 ("The significant difference between a two and a three-selection-state machine is that, using any sequence of commands, the former can only isolate or select slaves that satisfy a condition expressed by a left-nested expression. Using a two-selection-state machine, there is no sequence of commands that can process conditions that are expressed as as [sic] a SUM-of-left-nested-expressions."); 6:20-23 ("Only a three-selection-state machine can select slaves that satisfy a condition expressed by a sum-of-left-nested-expression."). Therefore, even the examples of the most difficult transfers included the from state, the to state, and the primitive condition.

Alien's definition is consistent with both the plain meaning of "specify" and the invention as disclosed in the specification. The Court construes "each of the commands [each command in the selection criterion command sequence] specifying" to mean "each command contains information that expressly identifies the 'transfer from state,' expressly identifies the 'transfer to state' and expressly identifies the 'primitive condition.' "

The parties also dispute the meaning of several limitations within this element, although the alternatives proposed are similar. The first limitation the parties dispute is "selection criterion command sequence." The parties agree this limitation means "a sequence of commands in which each command directs any slave satisfying the selection criterion to change its selection state."

The next disputed term is "transfer from state" and "from state." The Court concludes Intermec accurately describes the relationship the from state has to the transition. Therefore, the Court construes "transfer from state" and "from state" as "the state of the RFID tag from which the tag will move if the appropriate command and conditions are satisfied."

The third disputed term is "transfer to state" and "to state." Consistent with the last term, the Court concludes Intermec accurately describes the relationship the to state has to the transition. Therefore, the Court construes "transfer to state" and "to state" as "the state of the RFID tag to which the tag will move if the appropriate command and conditions are satisfied."

Finally, the parties dispute the meaning of "primitive selection condition" and "primitive condition." The dispute involves what kind of memory in which the primitive condition is stored. Alien suggests it must be long-term memory because the primitive condition is used repeatedly. However, the only word the claims and the specifications use is a tag with some memory containing at least one information value. '318 Patent, 5:64 ("a memory with stored information"); *e.g.* '318 Patent, claim 1, 23:14 ("a memory with one or more information values;"). The patents do not limit the claim to long-term memory. It would be improper to import a limitation that is not present in the record. Seachange Int'l, 413 F.3d at 1377. Therefore, the Court construes "primitive selection condition" and "primitive condition" to mean "a logical criterion sent in a command to be compared by the tag to data in memory."

4. Wherein two of the *states reverse roles* after an end of one or more subsequences in the sequence of commands ('318 Claim 1)

The dispute over this claim element involves when the reversing of state roles must occur. Must the reversing of roles take place after a subsequence within the sequence of commands but not at the end of the completed sequence, as Alien suggests; or may the reversing of roles occur at the end of any subsequence of commands, including the final subsequence, as Intermec argues.

The sequence of commands can be described as the sum of all commands the reader sends to the tag. A subsequence within the sequence would be the individual command. The specification clarifies little about the reversing of roles. Each state of the three-state machine has a defined role. '318 Patent, 14:54-62. However, the state's roles may alternate. *Id*. 13:63-64. Alien argues that practically speaking, the only time this would happen is after a subsequence in the middle of the sequence of commands because at the end of the sequence of commands, all selecting is done and the desired tags are together in one state. While the Court does not disagree that the most practical time to reverse roles would be before the final subsequence that ends the sequence of commands, nothing in the claims or specification limits the reversal to this time. As Intermec notes, the reversal could come at the end of any subsequence of commands, including the last in the string of commands, if that is what is commanded. It would be improper to import a limitation that is not present in the patent. Seachange Int'l, 413 F.3d at 1377.

However, Alien's proposed construction incorporates the idea that only two of the three states will reverse roles. The claims expressly limit the reversal to two states. Therefore, the Court construes "reverse roles" to mean "the roles of two of the three selection states in the selection criterion command sequence are reversed at the end of a sequence or subsequence of commands."

5. Deemed to be selected [deeming said each slave in a particular selection state to be selected]('318 Claims 11, 17, 18)

The final disputed limitation is found only in the '318 patent and addresses the purpose of the selection process. While the parties' proposed construction is different, both agree on the concept at issue (doc. # 381, p. 79; doc. # 370-2, p. 33).

The specification teaches that the reader selects subsets of tags to isolate the subset so the reader can further communicate with the tag. '318 Patent, 1:30-32 ("it is advantageous for the master to be able to select a subset of the slaves with whom to communicate further."); 6:49-52 ("If the slave does not satisfy the condition, the process assures that the slave will end up at a state that enables the slave to communicate further with the master."). "Deemed" is a commonly understood word for which a general purpose dictionary may be helpful. Phillips, 415 F.3d at 1314. The common definition for "deemed" is "to come to think or judge: consider." Webster's 325. From the common definition of deemed and the specification, we know the master considers the tag as selected so that it may communicate with the tag further. The Court concludes Alien's proposed definition summarizes these concepts. Therefore, the Court construes "deemed to be selected" as "the master considers the tag as selected for purposes of further communications."

G. U.S. Patent No. 5,850,181

Patent Number 5,850,181 ("the '181 Patent") discloses a method for "frequency hopping." The RFID industry operates in an RF range that the Federal Communications Commission ("FCC") does not require a license to use. '181 Patent, 3:1-10. While a user of RF waves within this range does not have to be licensed to broadcast at a particular frequency, the FCC also mandates that the user not continuously broadcast solely at any one fixed frequency. *Id*. Instead, the FCC requires the user to broadcast at any number of alternating frequencies, or "hop" from one frequency to another. *Id*. 3:1-10; 3:22. This concept, known as "frequency hopping," allows the unlicensed range to be used by numerous users at the same time without causing interference with one another. However, when a hop is done, the reader sending the signal cannot slide from one frequency to another. Instead, it must broadcast at one frequency, stop broadcasting momentarily, and then broadcast at the new frequency. 5:17-20. When this is done, a tag that derives at least some of its

power for communicating to the reader from the RF signal is in danger of losing power, greatly decreasing the efficiency of the system. '181 Patent, 2:52-58. The invention of the '181 Patent teaches a tag that stores enough power to remain on during the short hop from one frequency to another. Id. at 3:20-41. The parties dispute the meaning of two limitations.

1. Tag energy store (Claim 13)

The parties do not have significant differences in the concept of this limitation but rather dispute how specific a definition is required. The Court starts with the claim language. The full limitation states, "a tag energy store for storing the energy received from the rectifying circuit, ..." Id. at 8:30-31. From this language, we learn the tag energy store cannot be a battery because generally batteries possess their own energy charge. Therefore, the tag energy store must receive its power from rectified energy. The specification supports this as well. Figure 2 shows a semi-passive or active tag with its own "energy supply means 22 such as a battery...." Id. at 4:63-64. The figure also shows a tag energy store attached to a rectifier circuit. In its discussion of the tag energy store, the specification states, "Energy store 19 can be any means known in the art for storing energy, but is typically a capacitor on a semiconductor chip. Energy store 19 supplies energy to the electronic circuitry 20." '181 Patent, 4:19-22. Capacitors and semiconductor chips are known in the art to be used to store rectified energy. Thus, the tag energy store cannot be "the tag components capable of storing electrical energy," as Intermec proposes (doc. # 453, p. 13) because that definition would encompass a battery. At the *Markman* hearing, Intermec conceded "tag energy store" is not a battery.

Alien's proposed definition incorporates that the tag energy store must store rectified energy (*id.*). However, Alien argues the tag energy store must be "the primary component(s)." Primary does not have a source within the specification. The specification only requires the tag energy store be a means known in the art for storing rectified energy. '181 Patent, 4:19-22. The Court also disagrees with Alien that "provide power to the tag" is needed in the definition. While the tag energy store does provide some power to the tag, the specification explicitly states the tag may be passive or semi-passive (what the specification calls "active"). *Id.* 1:56-61; 3:46-51; 4:61-67. In other words, the tag can have other methods of supplying power to the tag, which makes its inclusion in this definition unnecessary. It would be improper for the Court to import limitations not in the record. Seachange Int'l, 413 F.3d at 1377. The Court agrees with Alien's suggestion that the tag energy store does not have to be a single component but could include multiple components serving the function. Therefore, the Court construes "tag energy store" to mean "one or more components that collect rectified energy."

2. Where the RF tag energy store is depleted so that the tag electronics do not function (Claim 13)

The dispute surrounding this limitation again revolves around how much of the tag's circuitry does not function. Alien suggests it means a loss of one or more electronic functions (doc. # 453, p. 13). Intermec argues the prosecution history proves the tag must be completely drained of power and all of the electronics have stopped performing their roles.

This element of claim 13 discloses a computer system that controls the frequency hopping of the reader and is fast enough that a hop is completed before the tag loses its power. '181 Patent, 8:37-44. The specification explains this is critically important because if the hop time exceeds the energy available in the tag, the tag will lose its memory, will restart communicating with the base station from the beginning, and interfere with efficient system communication. '181 Patent, 2:52-58; 6:53-57. The question becomes how many functions must be lost for the threat to materialize.

The prosecution history provides some guidance here. The original claim language stated, "where the time during which the power is reduced is less than the time where the RF tag loses *one or more functions*." (Doc. # 346-11 at 12) (emphasis added). The patent examiner rejected this language as being obvious under the prior art of EAS. (Doc. # 346-10 at 12). According to the examiner, the tags of the EAS prior art have no functions; they are either in the reader's field or not in the reader's field. *(Id*. at 12-13.) The EAS tags could never lose a function because they had no function to begin with. (*Id*. at 13.) The inventor attempted to distinguish the prior art by noting the tags of the '181 Patent had functions that could be lost when the tag energy store is depleted. (Id. at 13.) Nevertheless, the inventor changed claim 13 to its present language, according to the inventor, "to more precisely define the invention, ..." Id. Alien argues that because the inventor only changed the language to more precisely define the invention, no change in meaning was intended. Intermec counters that any change in the language must carry some change in meaning because otherwise there would have been no reason to change the language.

The Federal Circuit has directed district courts to consider the prosecution history of a patent if it is in evidence as part of the intrinsic evidence. Phillips, 415 F.3d at 1317. The prosecution history is helpful because it provides more information on how the inventor and Patent and Trademark Office understood the patent. *Id*. The Circuit has also warned, however, the prosecution history is not as clear or useful as the specification. *Id*.

A change to language in a patent application presumably means that a narrowing in scope is conceded. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 734, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002). "A rejection indicates that the patent examiner does not believe the original claim could be patented. While the patentee has the right to appeal, his decision to forgo an appeal and submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim." *Id*. A party is estopped from claiming the broader meaning originally sought in the application when the language is changed to narrow the patent and secure approval. *Id*. at 736 ("Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patent's scope."). Intermec, however, claims the inventor's amendment broadened the claims coverage to protect all functionality of the tag (doc. # 423, p. 79). Alien argues this analysis is unneeded because it is neither arguing the amendment narrowed the claim nor broadened it, and the specification, the more useful source, supports its position.

At some point, this argument becomes semantical. The parties seem to agree that whether one or all functions have quit, either way the tag is not functioning properly. This is exactly the concept the '181 Patent's invention sought to avoid. As the specification teaches, the frequency hop needs to be accomplished quickly so that the tag continues to function in the down time. '181 Patent 2:52-55 ("If the power reception is interrupted for a length of time which exceeds the energy storage time of the tag power supply, the tag 'loses' the memory that it was turned off from communication, ..."); 3:31-33 ("The time between pulses must be shorter than the time taken for the tag electronics to deplete the energy store on the tag."); 5:38-41 ("RF generator 50 can switch frequencies in a time less than the time t_c which is taken for the tag energy store 19 to be drained to a level where a critical tag function is impaired."); 6:53-57 ("This means that the off time t_o must be shorter than a first limit time because the tag will lose memory or other tag function, and longer than a second limit time, so that the frequency sent may change without introducing interfering levels of RF power outside the allowed channels."); 7:16-18 ("as long as the pauses in the power transmission are less than that time which would affect critical electronic components of the tag, are foreseen"). The Court concludes the inventor sought to avoid any improper functioning of the tag. Therefore, the Court construes "where the RF tag energy store is depleted so that the tag electronics do not function" to mean "the tag

energy store is depleted such that the tag electronics are unable to perform their roles."

III. Conclusion

For the reasons stated above, the Court construes the disputed claims of the seven patents-in-issue as listed in the Court's construction chart, attached below as an appendix.

IT IS SO ORDERED.

ALIEN TECH. V. INTERMEC, 3:06-CV-51

COURT'S CLAIM CONSTRUCTION CHART

U.S. PATENT NO. 5,528,222

Claim Element/Term	Claim	Construction
An antenna that is an *integral part of the substrate*	1	***Integral part of:*** **affixed to or fused with. (parties agreement).**
A circuit chip ... being *on the substrate in adjacent proximity* to the antenna	1	*Substrate:* A non-conductive material that serves as a platform upon which electronic circuitry is built. *On the substrate:* supported directly or indirectly by the substrate.
		in adjacent proximity: not stacked, meaning the chip and antenna occupy a single metal layer.
coplanar with	1	Lying or acting in the same plane.
encapsulant	7	A layer of non-conductive material encasing electronic components to protect them from the environment.
Laminated by one or more layers	11	Having a thin layer of material covering at least one surface.
Resonant antenna	18	An antenna having an input impedance having a nonzero resistance component and a zero reactance component.

U.S. PATENT NO. 6,400,274

Claim Element/Term	Claim	Construction
An antenna/antenna configuration	1, 2, 19	*Antenna:* A device for radiating or receiving radio waves.
		Antenna configuration: An arrangement of elements that serve the function of an antenna.
is *resonant* with the carrier frequency	19	***resonant:*** **having an input impedance having a nonzero resistance component and a zero reactance component. (parties' agreement)**

is substantially resonant with/at the carrier frequency	1, 2	Has an input impedance that is nonreactive at a frequency within a narrow operating range of frequencies surrounding the carrier frequency.
a modulation circuit that *shorts and opens the antenna terminals* at a *modulation frequency* in order to *change the antenna impedance*	2, 19	*Shorts and opens the antenna terminals:* Alternately establishing and removing a low impedance electrical connection across the antenna terminals, such that in the shorted state, nearly all of the current flowing from the antenna terminals flows through the low impedance electrical connection across the antenna terminals. ***Modulation frequency:*** **The specific rate at which the modulation circuit encodes data. (parties' agreement)**
		Change the antenna impedance: **Alter the current flowing in the antenna in order to alter the reflectance of the antenna. (parties' agreement)**
develop a voltage sufficient to power an electric circuit	1, 2, 19	Accumulate a rectified voltage sufficient to power the tag.
the voltage being developed within one period of the modulation frequency	2, 19	The voltage is accumulated within one period of the modulation frequency.

U.S. PATENT NO. 5,030,807

remote object	1, 4	Battery-powered RFID tag.
upon receipt of said RF signal	1, 4	As soon as the tag receives an RF signal.
selectively transmitted to and received and stored by a remote object *only after such remote object has been identified as the correct remote object to receive such data*	1, 4	***Selectively transmitted to:*** **transmitted for receipt and storage by an identified remote object. (parties' agreement)** ***Selectively ... received:*** **The data transmitted for receipt and storage by an identified remote object is received and accepted by that remote object. (parties' agreement)** **Selectively ... stored by: The data transmitted for receipt and storage by an identified remote object is copied into a data field in long-term memory. (parties' agreement)**
		only after such remote object has been identified as the correct remote object to receive such data: **Transmit data to be written to a tag only after the tag has identified itself to the interrogator, and the interrogator has determined that the tag is the proper tag to receive the data. (parties' agreement)**
said backscatter modulated signal being modulated with data indicating ... [the remote object's] ability or inability to receive and store transmitted data from said interrogator	4	**The backscatter-modulated returned signal from that object indicates its ability or inability to receive and store transmitted data. (parties' agreement)**

transmit[ting] data to said remote object only if ... said backscatter modulated returned signal indicates the ability of said remote object to receive and store transmitted data	4	**The reader will send data to the tag only if the tag indicates to the interrogator that it is able to receive and store the data to be sent by the reader. (parties' agreement)**
Sensing the strength of the received RF signal	6	**Detecting the strength of the received RF signal. (parties' agreement)**
determining whether or not it is adequate for data accurately to be written into said remote object	6	**The parties agree that the interpretation of this term depends upon the interpretation of the prior claim term-"sensing the strength of the received RF signal."**
and indicating this ability to said interrogator	6	Indicating to the interrogator whether the RF signal level is strong enough for the interrogator to write data.

U.S. PATENT NO. 6,812,841

Claim Element/Term	**Claim**	**Construction**
said analog circuit *providing state information defining a desired state of said RFID transponder*	1, 9, 21	***Providing:* to supply for use or make the state information available for use. (parties' agreement)** *State information:* information that can be used to determine the output of a digital state machine.
		State information defining a desired state of said RFID transponder: information obtained that determines the output of the digital state machine.
Corresponding to said analog signals	1, 9, 21	Related to the analog signals.
maintain said state information during a loss in power provided by said power capacitor	1, 9, 21	**The parties agree that their dispute about this term will turn on the Court's construction of "state information," and thus that this claim term need not separately be construed.**
a *state holding cell* coupled to said *digital state machine* and being adapted to maintain [maintaining] said state information during a loss in power	1	***State holding cell:* an electronic circuit structure for holding state information. (parties' agreement)**
		***digital state machine:* The parties agree that the term "digital state machine" need not be construed by the Court because there is no dispute that Alien's tags contain a digital state machine.**
Defines plural operating states	8, 13	May define more than one operating state.
means for maintaining said state information in the RFID transponder's state holding cell when the state machine is not receiving power from the interrogating RF signal	9	A capacitor coupled to a diode and equivalents thereof.
wherein said maintaining step further comprises *receiving [receive] a voltage corresponding to said state information,*	22	The voltage corresponding to the output of the digital state machine is stored within some capacitor(s).

U.S. PATENT NO. 5,828,318 ***AND*** U.S. PATENT NO. 6,812,852

Claim Element/Term	**Claim**	**Construction**
State(s)	'318: 1, 11, 17, 18; '852: 1, 11, 15, 18, 19	The configuration of information in the form of a finite state machine, which defines the condition of the tag.
Selection state	'318: 11, 17, 18	The condition of a finite state machine whose sole purpose is to isolate desired subsets of slaves from a set so that they may further communicate with a master.
Each of the commands [each command in the *selection criterion command sequence] specifying* a "*transfer from state*" *[a "from" state],* a " *transfer to state* " [a "*to*" *state*], and a *primitive [selection] condition*	'318: 1, 11, 17, 18; ' 852: 1, 11, 18, 19	*Each of the commands [each command in the selection criterion command sequence] specifying:* Each command contains information that expressly identifies the "transfer from state," expressly identifies the "transfer to state" and expressly identifies the "primitive condition." ***Selection criterion command sequence:*** **A sequence of commands in which each command directs any slave satisfying the selection criterion to change its selection state. (parties' agreement)** *Transfer from state and from state:* the state of the RFID tag from which the tag will move if the appropriate command and conditions are satisfied. *Transfer to state and to state:* the state of the RFID tag to which the tag will move if the appropriate command and conditions are satisfied.
		Primitive selection condition and primitive condition: a logical criterion sent in a command to be compared by the tag to data in memory.
wherein two of the *states reverse roles* after an end of one or more subsequences in the sequence of commands	'318: 1	*Reverse roles:* The roles of two of the three selection states in the selection criterion command sequence are reversed at the end of a sequence or subsequence of commands.
deemed to be selected [deeming said each slave in a particular selection state to be selected]	'318: 11, 17, 18	The master considers the tag as selected for purposes of further communications.

U.S. PATENT NO. 5,850,181

Claim Element/Term	**Claim**	**Construction**
tag energy store	13	One or more components that collect rectified energy.
where the RF tag energy store is depleted so that the tag electronics do not function	13	The tag energy store is depleted such that the tag electronics are unable to perform their roles.

D.N.D.,2008.
Alien Technology Corp. v. Intermec, Inc.