United States District Court,
W.D. Wisconsin.

GARMIN LTD. and Garmin Corporation,
Plaintiffs.
v.
TOMTOM, INC,
Defendant.
TomTom, Inc. and Baldivi B.V,
Counterplaintiffs.
v.
Garmin Ltd., Garmin Corporation, and Garmin International,
Inc. Counterdefendants.

No. 06-C-0062-C

Aug. 24, 2006.

Trent B. Webb, Shook, Hardy & Bacon L.L.P., Kansas City, MO, John Scheller, Michael Best & Friedrich LLP, Madison, WI, Walter R. Brookhart, Shook, Hardy & Bacon, LLP, Houston, TX, for Plaintiffs/CounterDefendants.

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OPINION AND ORDER

BARBARA B. CRABB**, District Judge.**

In this civil action for monetary, declaratory and injunctive relief, the parties accuse one another of infringing a number of patents pertaining to navigation systems and positioning technology. The case is presently before the court for a ruling on the construction of certain elements within dozens of claims in the eight patents at issue. Garmin Ltd., Garmin Corporation and Garmin International, Inc. filed a joint claims construction brief and I will refer to these three parties collectively as "plaintiff." TomTom, Inc. and Baldivi B.V. submitted a joint claims construction brief and I will refer to them together as "defendant." Having studied the parties' briefs and their arguments at a hearing held on July 28, 2006, I construe the claims at issue as set forth below.

OPINION

A. *Legal Framework for Claim Construction*

1. *General canons of claim construction*

Infringement analysis begins with construction of the claims at issue. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996); Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed.Cir.1995). It is a legal determination to be made by the court. Vitronics, 90 F.3d at 1582. "It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history." *Id.i* Construction of the disputed terms begins with the language of the claims themselves. Generally, "all terms in a patent claim are to be given their plain, ordinary and accustomed meaning to one of ordinary skill in the relevant art." Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed.Cir.2001). Moreover, "unless compelled to do otherwise, a court will give a claim term the full range of its ordinary meaning as understood by an artisan of ordinary skill." *Id.*

In many instances, however, a court must proceed beyond the bare language of the claims and examine the patent specification. The specification serves an important role in arriving at the correct claim construction because it is in the specification that the patentee provides a written description of the invention that allows a person of ordinary skill in the art to make and use the invention. Markman, 52 F.3d at 979. In particular, the specification must be consulted because "patent law permits the patentee to choose to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term that could differ in scope from that which would be afforded by its ordinary meaning." Rexnord, 274 F.3d at 1342; Vitronics, 90 F.3d at 1582 ("a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history"). Although the patent specification does not broaden or narrow the invention, which is specifically laid out in the patent's claims, the specification may be used to interpret what the patent holder meant by a word or phrase in the claim. E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed.Cir.1988); *see also* Vitronics, 90 F.3d at 1582 (when term is not specifically defined in claims, it is necessary to review specification to determine whether inventor uses term inconsistently with its ordinary meaning). The specification may be " 'necessary to give life, meaning, and vitality' " to terms in certain claims. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1306 (Fed.Cir.1999) (quoting Kropa v. Robie, 38 C.C.P.A. 858, 187 F.2d 150, 152 (C.C .P.A.1951)); *see also* Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 1053 (Fed.Cir.1989) ("this court has consistently adhered to the proposition that courts cannot alter what the patentee has chosen to claim as his invention, that limitations appearing in the specification will not be read into claims, and that interpreting what is *meant* by a word *in* a claim 'is not to be confused with adding an extraneous limitation appearing in the specification, which is improper' ") (emphasis in original; internal citation omitted). However, it is settled law that the reach of a patent is determined by its claims and not its specifications. Rexnord, 274 F.3d at 1344. "[A]n applicant is not required to describe in the specification every conceivable and possible future embodiment of his invention." *Id.* (citing SRI International v. Matsushita Electric Corp. of America, 775 F.2d 1107, 1121 (Fed.Cir.1985)).

After considering the claim language and the specification, a court may consider the final piece of intrinsic evidence, the patent's prosecution history. Vitronics, 90 F.3d at 1582. "[S]tatements made during the prosecution of a patent may affect the scope of the invention." Rexnord, 274 F.3d at 1343. Generally, the prosecution history is relevant if a particular interpretation of the claim was considered and specifically disclaimed during the prosecution of the patent. Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 30, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997); Vitronics, 90 F.3d at 1582-83. Typically, analysis of the intrinsic evidence will eliminate any ambiguity in the claim terms, rendering unnecessary any

reference to extrinsic evidence, such as expert testimony, inventor testimony, dictionaries, technical treatises and articles. Vitronics, 90 F.3d at 1583. However, a court may find it helpful to consult extrinsic evidence to be sure that its claim construction "is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field." Pitney, 182 F.3d at 1309. On the other hand, courts are "not to rely on extrinsic evidence in claim construction to contradict the meaning of claims discernible from thoughtful examination of the claims, the written description, and the prosecution history." Id. at 1308.

2. *Means-plus-function claims*

Defendant's three patents-at-issue are written largely in means-plus-function form. Such claims are authorized by 35 U.S.C. s. 112 para. 6, which provides that:

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.

Congress added this language to the Patent Act of 1952 in response to a decision of the United States Supreme Court finding invalid the use of means-plus-function language on the grounds that it was overly broad and ambiguous. Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1, 67 S.Ct. 6, 91 L.Ed. 3 (1946). In *Halliburton,* the Supreme Court held that the patent laws did not permit claims that described a supposedly new combination in terms of what it would do "rather than in terms of its own physical characteristics or its arrangement in the new combination apparatus." *Id*. at 9. In the Court's view, permitting such broad claims would allow a patent holder to bar anyone else from using any device that performs the same function as the one he has claimed. *Id*. ("[j]ust how many different devices there are of various kinds and characters which [might perform this function], we do not know").

Congress's reaction to the *Halliburton* opinion was to permit broad means-plus-function language but to add a standard to make the claim language more definite. Valmont Industries, Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042 (Fed.Cir.1993); In re Donaldson Co. ., 16 F.3d 1189, 1194 (Fed.Cir.1994) (en banc). Paragraph 6 of s. 112 requires a court to look to the specifications and interpret the claim to cover only the corresponding structure disclosed therein and its equivalents. Id. at 1195. Therefore, a means-plus-function claim reads on an accused infringing device only if that device employs means identical or equivalent to the structures, material or acts described in the patent specification. King Instruments Corp. v. Perego, 65 F.3d 941, 945 (Fed.Cir.1995).

The court's task in construing a means-plus-function claim is to determine the claimed function and the corresponding structure. WMS Gaming Inc. v. International Game Tech., 184 F.3d 1339, 1347 (Fed.Cir.1999). "The 'means' term in a means-plus-function limitation is essentially a generic reference for the corresponding structure disclosed in the specification." Chiuminatta Concrete Concepts v. Cardinal Industries, Inc., 145 F.3d 1303, 1308 (Fed.Cir.1998). Under s. 112, para. 6, "an applicant can describe an element of his invention by the result accomplished or the function served, rather than describing the item or element to be used (for example, 'a means of connecting Part A to Part B, rather than 'a two-penny nail')." Warner-Jenkinson, 520 U.S. at 27. "A determination of corresponding structure, therefore, is a determination of the meaning of the 'means' term in the claim and is thus also a matter of claim construction." Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1211 (Fed.Cir.1998); B. Braun Medical v. Abbott Laboratories., 124 F.3d 1419, 1424-25 (Fed.Cir.1997) (determining de novo which structures disclosed in

specification corresponded to means limitation).

However, 35 U.S.C. s. 112 does not "permit incorporation of structure from the written description beyond that necessary to perform the claimed function." Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1258 (Fed.Cir.1999) (citing Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1302 (Fed.Cir.1999)). A structure in the specification is a "corresponding structure" if "the specification or prosecution history clearly links or associates that structure to the function recited in the claim." Medtronic, Inc., v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 1311 (Fed.Cir.2001); *see also* Medical Instrumentation and Diagnostic Corp. v. Elekta AB, 344 F.3d 1205, 1210 (Fed.Cir.2003) (citing B. Braun Medical, 124 F.3d at 1424). "In the past, we have rejected similar attempts to include as additional corresponding structure for a particular function a structure that is disclosed in the specification but is not associated with the particular claimed function. Medical Instrumentation, 344 F.3d at 1216. "Under s. 112, para. 6, a court may not import functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function." Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 1233 (Fed.Cir.2001). "Features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations." Northrop Grumman Corp. v. Intel Corp., 325 F.3d 1346, 1352 (Fed.Cir.2003) (internal citations omitted). "The corresponding structure to a function set forth in a means-plus-function limitation must actually perform the recited function, not merely enable the pertinent structure to operate as intended...." Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 1371 (Fed.Cir.2001). "Consistent with the principle that only that structure necessary to perform the function is a limit on the claim, the Court emphasizes that not every portion of the flowcharts are necessarily included to perform the function. Rather, only those specific flowcharts, or portions of flowcharts necessary to perform the various means responsive limitations disclosed in each of the claims are incorporated as limitations on the claims." Itron, Inc. v. Benghiat, 169 F.Supp.2d 1073, 1093 (D.Minn.2001).

The revealed structure must be necessary to perform the function, Omega Engineering, Inc. v. Raytek Corp., 334 F.3d 1314, 1322 (Fed.Cir.2003), but it is not the case that the corresponding structure "must include all things necessary for the claimed invention to work; however, 'it must include all structure that actually performs the recited function.' " De Technologies, Inc. v. Dell, Inc., 428 F.Supp.2d 512, 515 (W.D.Va.2006) (citing Default Proof Credit Card Systems, Inc. v. Home Depot USA, 412 F.3d 1291, 1298 (Fed.Cir.2005)). "Identification of corresponding structure may embrace more than the preferred embodiment. A means-plus-function claim encompasses all structure in the specification corresponding to that element and equivalent structures." Micro Chem., 194 F.3d at 1258.

"In a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." WMS Gaming, 184 F.3d at 1349 (citing In re Alappat, 33 F.3d 1526, 1545 (Fed.Cir.1994). "A computer-implemented means-plus-function term is limited to the corresponding structure disclosed in the specification and equivalents thereof, and the corresponding structure is the algorithm." Harris Corp. v. Ericsson Inc., 417 F.3d 1241, 1253 (Fed.Cir.2005). The patent "must disclose an algorithm to be performed by the computer to accomplish the recited function." Finisar Corp. v. The DirecTV Group, Inc., 416 F.Supp.2d 512, 518 (E.D.Tex.2006) (citing WMS Gaming, 184 F.3d at 1349). "This does not mean that the patentee must disclose specific source code for the computer. And, the term 'algorithm' is not limited to a formula or mathematical symbols. For example, the steps, formula, or procedures to be performed by the computer might be expressed textually, or shown in a flow chart." Finisar, 416 F.Supp.2d at 518. An algorithm is "a set of rules for solving a problem

in a finite number of steps; a sequence of steps designed for programming a computer to solve a specific problem." *Webster's College Dictionary* 33 (2d ed.1999). *See also* State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1374 (Fed.Cir.1998) ("every step-by-step process, be it electronic or chemical or mechanical, involves an algorithm in the broad sense of the term").

"The requirement that a particular structure be clearly linked with the claimed function in order to qualify as corresponding structure is also supported by the requirement of 35 U.S.C. s. 112, para. 2 that an invention must be particularly pointed out and distinctly claimed." *Medical Instrumentation,* 344 F.3d 1211 (citing B. Braun, 124 F.3d at 1424-25). According to the Federal Circuit:

The price that must be paid for the use of [mean-plus-function claim drafting] is limitation of the claim to the means specified in the written description and equivalents thereof. If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid that price but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification. Such is impermissible under the statute.

Medical Instrumentation, 344 F.3d at 1211(citing O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1583 (Fed.Cir.1997)).

"The correct inquiry is to look at the disclosure of the patent and determine if one of skill in the art would have understood that disclosure to encompass software for [performing the associated function], not simply whether one of skill in the art would have been able to write such a software program." Medical Instrumentation, 344 F.3d at 1212 (citing Amtel Corp. v. Info. Storage Devices, Inc., 198 F.3d 1374, 1380 (Fed.Cir.1999)). In other words, the inquiry is "not whether one of skill in the art could implement a structure, but whether one would understand the specification to disclose the structure." De Technologies, 428 F.Supp.2d at 517 (citing Medical Instrumentation, 344 F.3d at 1212).

I have applied these rules of claims construction to each of the disputed terms. In most instances, I had to look no further than the claim language and the specification to arrive at the suitable construction. In several instances I found that the disputed claim language was clear and unambiguous as written in the claim and required no judicial construction. In some instances however, I found that defendant had not adequately disclosed in its patents the structure corresponding to the associated function.

B. U.S. Patent No. 6,687,615

Plaintiff's '615 patent discloses systems, devices and methods to calculate one or more detour routes that avoid portions of an original route.

1. ***Thoroughfare***

The term "thoroughfare" appears in almost every claim of the '615 patent. Plaintiff defines it as "public road" but defendant seeks to include "waterway and channel" in the definition. According to defendant, plaintiff's attempt to limit the term "thoroughfare" to "public roads" is "a transparent effort to avoid prior art in the marine and aviation navigation fields." Dft.'s Br., dkt. # 54 at 83. Defendant's argument is not persuasive. It is true that the specification states:

As one of ordinary skill in the art will understand upon reading this disclosure, the device can be portable and can be utilized in any number of implementations such as automobile, personal marine craft, and

avionic navigation.

'615 pat., col. 4, lns. 19-23. However, defendant is incorrect when it argues that because the navigation device "can be utilized" in marine and avionic crafts, the term "thoroughfare" must necessarily include waterways and channels to account for use at sea and in the air. As plaintiff correctly points out, aside from the excerpt quoted above, the remainder of the specification is directed strictly at a navigation device to be used in automobiles ("The intended or unintended detour can be for reasons such as thoroughfare conditions, thoroughfare congestion (e.g. Rush hour or road construction)...." Col. 1, lns. 27-29. "And as used herein, thoroughfare type can includes [sic] a designated thoroughfare type such as an interstate, county road, state road, state highway, and the like classification." Col. 10, lns. 49-52). Therefore, I will use plaintiff's proposed construction of "public road."

2. *Route*

Like thoroughfare, the term route is prevalent throughout the disputed claims in the '615 patent. Plaintiff defines "route" as "course of travel" and defendant defines it as "course of travel from one place to another." This term does not require much discussion. I will adopt plaintiff's definition and construe "route" as "course of travel" because it is implicit in the concept of "travel" that one is going from one place to another; defendant's definition is redundant.

3. *Dynamically receiving data*

Claim 9 describes "[a] navigation aid method for performing a detour route calculation, comprising...." The first subpart of claim 9 reads: "dynamically receiving data relating to a portion of a particular thoroughfare in a route." The parties agree that "dynamically receiving" means "receiving in real time." The dispute is whether to insert the term "user-selected" prior to "portion," as plaintiff advocates. According to plaintiff, the only possible type of "dynamically received data" is "data input by a user of the device." Plt.'s Br., dkt. # 56 at 26. Plaintiff is wrong. Plaintiff bases its argument on a portion of the specification which states:

By way of example and not by way of limitation, the additionally received dynamic data can include dynamic data input by a user of the device indicating that the user is not satisfied with the new route....

'615 pat., col. 9, lns. 40-43. This does *not* suggest that the only way the device can receive data is via user input. It would be inappropriate to insert this proposed limitation into the claim, particularly when it does not appear explicitly in the specification. As defendant points out, dkt. # 54, at 91, the specification makes it clear that the navigational device may communicate with remote servers via various communications channels ('615 pat., col. 7, lns. 1-32). I construe "dynamically receiving data relating to a portion of a particular thoroughfare in a route" to mean "receiving in real time data relating to a portion of a particular thoroughfare in a route."

4. *With a preference for avoiding*

The second subpart of claim 9 states: "calculating a new route to a desired destination *with a preference for avoiding the particular portion of the thoroughfare in the route*." The parties disagree about the phrase that I have underlined. Their primary dispute concerns the meaning of "with a preference for avoiding." Plaintiff suggests that it means, "with a bias for refraining from use." Defendant defines it as "the likelihood ... is reduced, but not eliminated." Neither construction accurately captures the description provided in the specification. I construe "with a preference for avoiding" to mean "with the possibility of avoiding." This is

consistent with the specification, which explains that the device exercises "high, medium or low" levels of preference ('615 pat., col. 10, lns. 34-35). Plaintiff again asks the court to insert "user-selected" before "portion of the thoroughfare." For the reasons discussed in Section 3 above, I decline to do so. Accordingly, I construe the disputed phrase as: "with the possibility of avoiding the particular portion of the thoroughfare in the route."

5. ***Calculating the second new route***

The third subpart of claim 9 reads:

wherein calculating a new route to a desired destination includes calculating a second new route different from a first new route, wherein the first new route is a first detour route, and *calculating the second new route includes calculating the second new route with a preference for avoiding a particular portion of a thoroughfare in the first detour route and the particular portion of the thoroughfare in the route*.

The phrase at issue is underlined. The dispute is identical to the dispute concerning the second subpart of claim 9 discussed in section 4 immediately above (that is, the definition of "preference for avoiding" and whether "a portion of a thoroughfare" is a "user-selected" portion). For the reasons discussed above, I construe this phrase as follows: "calculating the second new route includes calculating the second new route with the possibility of avoiding a particular portion of a thoroughfare in the first detour route and the particular portion of the thoroughfare in the original route."

Plaintiff wishes to add "for which data was dynamically received" at the end of the phrase. It is unnecessary to do so because the first subpart of claim 9 already opens with this very phrase ("dynamically receiving data relating to a portion ..."). Since the steps described in the third subpart are a continuation of steps described in the first subpart, it would be redundant to repeat the concept.

C. U.S. Patent No. 6,999,873

Plaintiff's '873 patent was filed with the United States Patent and Trademark Office as a continuation of the '615 patent. The specification for the '873 patent is identical to the specification for the '615 patent and the '873 patent entails the same technology and methods revealed in the ' 615 patent.

1. ***Thoroughfare***

For the reasons discussed in Section B.1 above, I construe the term "thoroughfare" whenever it appears in the '873 patent as "public road."

2. ***Cartographic data***

The term "cartographic data" appears throughout the '873 patent. Plaintiff continues to argue that the '873 patent pertains only to automobile navigation: it defines "cartographic data" as "map data." On the other hand, defendant, pursues the argument that the '873 patent is also relevant to marine and air craft: it defines "cartographic data" as "data relating to maps or charts." For the same reasons that I restricted the definition of "thoroughfare" to "public road," I restrict the definition of "cartographic data" to "map data." I am satisfied that the '873 patent concerns only automobile navigation and I will not broaden the meaning of critical terms in this patent to include terminology pertaining to marine or air craft.

3. *Route*

For the reasons discussed in Section B.2 above, I construe "route" as "course of travel."

4. *Electronic navigational aid device*

Claims 1 and 10 describe the components of an "electronic navigational aid device." Although plaintiff maintains that the term "electronic navigational aid device" requires no construction, defendant asks the court to define it as "any electronic device designed to provide information used for navigation, including an in-vehicle system, hand-held system, etc." Although the term is not particularly ambiguous, I construe it for clarity as, "any electronic device designed to provide information used for in-vehicle navigation." Neither the claim language or the specification limits the device to a "hand-held system" or any other system, so there is no need to add any such limitations to the claim.

5. *Plurality of types*

The second subpart of Claim 1 reads:

a memory adapted to communicate with the processor, the memory having cartographic data and a desired destination, *the cartographic data including data indicative of thoroughfares of a plurality of types*.

The disputed phrase (which also appears in the second subpart of claim 10) is underlined. The parties agree that "plurality of types" means "plurality of classifications." The dispute is whether "plurality" means "one or more," as defendant contends, or "two or more," as plaintiff contends. Nothing in the patent or the specification negates the common meaning of "plurality," which is, "a number greater than one." *Webster's College Dictionary* 1015 (2d ed.1999). Accordingly, I construe the phrase as, "the cartographic data including data indicative of thoroughfares of two or more classifications."

6. *Displaying the cartographic data*

The third subpart of claim 1 reads: "a display connected to the processor and capable of *displaying the cartographic data*." The disputed phrase is underlined. Plaintiff defines "displaying" as "graphically depicting." Defendant maintains that the term needs no construction, or in the alternative, that it should be construed as "showing." Defendant's definition is consistent with the ordinary meaning of the term "display." ("To show or exhibit; make visible." *Webster's College Dictionary* 380 (2d ed.1999)). To define "displaying" as "graphically depicting" would add unnecessary confusion to an otherwise straightforward concept. *Graphically* depicting suggests that there may be *graphs* involved in the display and graphs come in a variety of forms. Plaintiff argues that, "[t]he phrase 'capable of displaying the cartographic data' is contextually defined in the specification of the '873 patent and should be construed consistent with such disclosure," dkt. # 56 at 28-29, but there is nothing in the claim or the specification to support or explain the use of the term "graphically." I construe the phrase, "displaying the cartographic data" as "showing the cartographic data."

7. *Process travel along a route*

The fourth subpart of claim 1 reads: "wherein the device is adapted to *process* the device's location and *travel along a route*." The disputed phrase is underlined. Defendant contends that the phrase needs no construction (besides the term "route"), but plaintiff argues that "process ... travel along a route" should be

construed as "monitor progress along an established or selected route." Plaintiff's definition of "process" as "monitor" is consistent with the specification, which explains that "the server processes the majority of a device's travel along the route using a set of processing algorithms and the cartographic and route data ...." '873 pat., col. 8, lns. 28-30. It is clear that the server uses processing algorithms to keep up with, or monitor the device's travel. However, plaintiff's inclusion of "establish or selected" in the definition is inappropriate because it adds functions that were not included in the claim. The claim discloses nothing about who or what establishes or selects the route. I construe the phrase, "process ... travel along a route" to mean "monitor ... travel along a route."

8. ***Preference for avoiding***

The fifth subpart of claim 1 reads:

wherein the device is adapted to calculate a new route to the desired destination *with a preference for avoiding a particular portion of a thoroughfare or one or more different thoroughfares in a previous route*.

The disputed phrase is underlined. The primary dispute is whether "with a preference for avoiding" means "with a bias for refraining" or "such that the likelihood ... is reduced, but not eliminated." For the reasons discussed in section B.4 above, I construe "with a preference for avoiding" as "with the possibility of avoiding." Plaintiff suggests also that the term "a particular portion" should be construed as "a part." I find that "a particular portion" is unambiguous, making any change unnecessary. Accordingly, I construe "with a preference for avoiding a particular portion of a thoroughfare or one or more different thoroughfares in a previous route" as: "with the possibility of avoiding a particular portion of a thoroughfare or one or more different thoroughfares in a previous route."

9. ***Portable***

Dependent claims 7 and 9 concern a "portable electronic navigational aid device." The parties dispute the meaning of "portable." Defendant defines it as "movable" and plaintiff defines it as "self-contained and easily transportable." As plaintiff correctly points out, dkt. # 56 at 17, "movable" is too broad a definition. It is clear from the specification that plaintiff is referring to a device that can be moved in and out of a vehicle *easily*. I construe "portable" as "easily transportable," which is consistent with the plain and ordinary meaning of the term ("Easily carried or conveyed by hand." *Webster's College Dictionary* 1027 (2d ed.1999)).

10. ***Personal digital assistant***

Dependent claim 8 reads: "The device of claim 7, wherein the portable electronic navigational aid device includes a personal digital assistant (PDA)." The parties dispute the construction of "personal digital assistant," but neither party has proposed an adequate construction of the term. Plaintiff's definition, "handheld computing device," is too broad. Defendant's definition ("a hand-held computer with a keyboard, display, and personal organizer functionality including data indicative of calendar, address book, scheduler, etc."), is too narrow and deviates from the specification because it focuses on conceivable features of personal digital assistants that are not critical to the '873 patent. The specification recites the following regarding the personal digital assistant:

The navigational device 310 shown in FIGS. 3A-3C includes a personal digital assistant (PDA) with integrated GPS receiver and cellular transceiver according to the teachings of the present invention. The

GPS integrated PDA operates with an operating system (OS) such as, for example, the well-known Palm or Pocket PC operating systems, or the lesser-used Linux OS. As shown in the top view of FIG. 3A, the GPS integrated PDA 310 includes an internal integrated GPS patch antenna 314 and a cellular transceiver 316 contained in a housing 318.... It should be understood that the structure of GPS integrated PDA 310 is shown as illustrative of one type of integrated PDA navigation device. Other physical structures, such as a cellular telephone and a vehicle-mounted unit are contemplated within the scope of this invention.

'873 pat., col. 4, lns. 59-67; col. 5, lns. 1-2, 22-26. In the context of the '873 patent, the essence of a personal digital computer is that it must be capable of interacting with a GPS information system. The personal digital assistant can come in many forms, including cellular telephones and vehicle mounted units. Accordingly, I construe "personal digital assistant" to mean "a hand-held computing device with an integrated GPS receiver."

11. ***Integral distances***

Claim 10 discloses "an electronic navigational aid device with route calculation capabilities." The fifth subpart is in dispute: "wherein the device is adapted to calculate a new route including determining a distance to avoid from a number of integral distances." In particular, the dispute is whether an "integral distance" must be a "whole number distance" (defendant's position) or can also be a fraction of a whole number (plaintiff's position). Defendant has the better argument, given the language in the specification (but not because of what plaintiff may have argued during prosecution of a different patent, as defendant suggests, dkt. # 54 at 98-99), which states:

For example, determining a distance to avoid can include determining distance from a number of integral distances, e.g., 1, 5, 10, and 20 miles. Likewise, determining a distance to avoid can include a user inputting a distance value.

'873 pat., col. 11, lns. 19-23. It is clear that there are at least two ways of determining a distance to avoid. In the first method ("determining a distance to avoid can include determining distance from a number of integral distances, e.g., 1, 5, 10, and 20 miles") it is apparent that plaintiff intended for "integral" to mean "integer," given the examples that follow the explanation ("e.g., 1, 5, 10, and 20 miles"). In the second method, the system allows a user to input a distance value and does not limit the values to "integral distances," so presumably the user can input whatever distance she wants, including fractions of miles. At the claims construction hearing, plaintiff argued that defendant's proposed construction of "integral distance" would render the invention useless, because a distance of less than one mile could never be avoided. However, in making that argument, plaintiff appeared to be overlooking the fact that the specification discloses ways in which less than one mile *can* be avoided (for instance, the user may input whatever distance she wants to avoid). The fifth subpart of claim 10, at issue here, focuses on only *one* method for selecting a distance to avoid. I cannot broaden the scope of this claim to include methods and processes not written into the claim. Accordingly, I construe "from a number of integral distances" to mean "from a whole number distance."

D. U.S. Patent No. 6,901,330

Plaintiff's '330 patent is directed to navigation systems that provide audible spoken guidance to facilitate vehicle navigation.

1. ***Electronic navigational aid device***

Claims 1 and 9 disclose an "electronic navigational aid device." Plaintiff maintains that this term needs no construction, but defendant asks the court to construe it as "any electronic device designed to provide information used for navigation, including an in-vehicle system, hand-held system, etc." For the reasons provided in section C.4. above, I construe "electronic navigational aid device" as, "any electronic device designed to provide information used for in-vehicle navigation." Likewise, where the term "navigation device" appears in claim 24, I construe it as "any device designed to provide information used for in-vehicle navigation."

2. ***Voice guidance***

This term appears throughout the '330 patent. Plaintiff proposes that it means "spoken words that give accurate directions." Defendant's construction, which I adopt, is more narrowly tailored to the context of the '330 patent: "spoken words that give accurate directions about how to navigate at a particular position."

3. ***Cartographic data***

This term appears throughout the '330 patent. For the reasons discussed in section C.2 above, I construe "cartographic data" as "map data."

4. ***Route***

This term appears throughout the '330 patent. For the reasons discussed in section B.2 above, I construe "route" as "course of travel."

5. ***Portable***

The term "portable electronic navigational aid device" appears in claims 9, 10 and 11. The dispute is over the term "portable." The parties advance the same arguments they made in the context of the '873 patent. For the reasons discussed in section C.9, I construe "portable" as "easily transportable."

6. ***Personal digital assistant***

Claims 10 and 11 disclose a personal digital assistant. The specification (col. 5, lns. 42-47; col. 6, lns. 4-8) describes the personal digital assistant in identical fashion to the description of "personal digital assistant" in the '873 patent. For the reasons discussed in section C.10 above, I construe "personal digital assistant" as "a hand-held computing device with an integrated GPS receiver."

7. ***Current travel speed***

Claim 24 discloses "[a] navigation aid method for negotiating decision points in a route using a navigation device, comprising...." The first subpart of claim 24 reads: "determining a current travel speed and a current position for the navigation device." The disputed term is "current travel speed." Plaintiff defines it as "present travel speed" and defendant defines it as "present actual speed." Defendant argues that the word "actual" is necessary to distinguish this concept from the concept of the vehicle's "average speed," which appears elsewhere in the patent. Dft.'s Br., dkt. # 54, at 101. I disagree with defendant. I adopt plaintiff's definition of "present travel speed ." Except where the term " *average* speed" is used in the patent, it is clear that "present travel speed" means the speed the vehicle is traveling at in fact, making the word "actual" unnecessary.

8. ***Initial voice guidance***

Claim 38 reads as follows:

The method of claim 24, wherein providing voice guidance to navigate the decision point includes providing an initial voice guidance, an advance voice guidance, and a confirmation voice guidance, wherein the initial voice guidance, the advance voice guidance and the confirmation voice guidance provide different prompts to provide specific guidance when the decision point is within an initial guidance range, within an advance guidance range, and within a confirmation guidance range.

The first disputed term in this claim is "initial voice guidance." The parties' dispute is whether an initial voice guidance must necessarily be triggered by a prior decision or whether, as plaintiff suggests, it is merely "guidance that provides a user with an awareness of a situation." According to defendant, an initial voice guidance is triggered by a previous decision (its proposed construction is, "the first voice guidance given after a previous decision has been made and indicating how long it will be before another decision has to be made"). Defendant anchors its position on a section of the specification describing one particular embodiment of the invention:

The initial voice guidance provides a user with an awareness of the situation. That is, a decision recently has been made, and the initial voice guidance indicates how long it will be before another decision has to be made.

'330 pat., col. 11, lns. 35-38.

Plaintiff disputes defendant's construction, pointing out that other sections of the specification link the initial voice guidance to an *upcoming* decision, not a *previous* decision ("According to one embodiment, the device provides an initial voice guidance for an upcoming decision point...." Col. 3, lns. 1-3. "According to one embodiment, the device 616 provides an initial voice guidance 632 for an upcoming decision point...." Col. 10, lns. 56-57.) Plaintiff cites the description of an embodiment different from the one defendant cited, which states:

In one embodiment, determining the device's current travel speed and position includes using a global positioning system. At 1162, it is determined whether the device is approaching a decision point in the route. The device may, for example, be within an initial guidance range, an advance guidance range, or a confirmation guidance range. If a decision point is being approached, the process proceeds to 1164 where voice guidance is provided.

'330 pat., col. 14, lns. 50-58. According to plaintiff, dkt. # 56 at 22, this embodiment "and the associated discussion reflect consideration of the vehicle's relation to an approaching decision point, not to a previous decision point." There is no question that an initial voice guidance (or *any* voice guidance) occurs only if there is an upcoming decision point. However, there is also no question that an initial voice guidance occurs only after a prior decision has been made. Plaintiff has appropriately identified the only exception to this, which is when the device is first turned on. Despite plaintiff's objections to defendant's construction, plaintiff has not provided any scenarios (other than when the device is first turned on) that render defendant's construction inaccurate. Even when the functions of one or more voice guidances are collapsed together, the initial voice guidance still appears after a decision point:

According to various embodiments, the functions of one or more of the voice guidance 732, 734 and 736 may be combined as appropriate for various types of route legs 746. For example, a route leg 746 may be too short to provide all three voice guidance prompts 732, 734 and 736. In this situation, the function of the initial voice guidance 732 and the advance voice guidance 734 may be combined into one voice guidance prompt that serves to provide a situation of awareness *after the decision point* 742, but that also provides sufficient information regarding the upcoming decision point 744 to safely navigate through the decision point. In other words, instead of having three voice guidance prompts, a route leg may only have one or two voice guidance prompts with the appropriate detail to navigate through the upcoming decision point.

'330 pat., col. 12, lns. 32-46 (emphasis added). Accordingly, I construe "initial voice guidance" to mean "the first voice guidance given after a previous decision has been made or after the device is first turned on that supplies the user with information about the next decision point."

9. ***Confirmation voice guidance***

The parties' disagreement regarding the term "confirmation voice guidance" in claim 38 is insignificant and amounts to nothing more than word order. Plaintiff construes it as "voice guidance given after the initial voice guidance and advance voice guidance for an imminent decision point." Defendant construes it as "voice guidance given after the initial voice guidance and advance voice guidance, and indicating that a decision point is imminent." Defendant's proposal is clearer and I adopt it almost in its entirety as the proper construction for "confirmation voice guidance": "voice guidance given after the initial voice guidance and advance voice guidance indicating that a decision point is imminent."

10. ***Guidance range***

The parties' primary dispute concerning the term "initial guidance range" in claim 38 is whether the range entails a "pre-set" distance or time (as defendant contends) or a "distinct" distance or time (as plaintiff contends). Each of the descriptions of the initial guidance range appearing in the specification describes a "predetermined delay." *See, e.g.,* col. 11, lns. 27-31, 49-54. Defendant points out correctly, dkt. # 54 at 107, that, "[t]he patent describes no other way to decide when to deliver the initial voice guidance other than from a time or distance from the previous decision point." The term "distinct" is not only vague but also evades the explicit teaching of the specification. Because I have already determined (in section D.8) that the initial voice guidance occurs after a previous decision has been made or after the device is first turned on, I construe "initial guidance range" to mean "a pre-set distance or time period measured from the previous decision point or from the time the device is first turned on."

Likewise, the parties' dispute concerning the term "advance guidance range" in claim 38 is whether the range entails a "pre-set" or a "distinct" delay. In this case, neither party has proposed an accurate construction of the term. In the context of "initial guidance range," the specification explicitly described a "predetermined delay," but in this context the description of "advance guidance range" does not reveal that the delay is predetermined. The specification provides that, "[a]ccording to one embodiment, the advance voice guidance range is a time-based range." Col. 11, lns. 31-32. The specification provides also that "[t]he advance voice guidance range occurs early enough with respect to a time-based reference, or far enough with respect to a distance-based reference, to change lanes or otherwise become ready to safely navigate through the decision point 744." Col. 11, lns. 60-65. Defendant's contention that the time or distance-based period is pre-set is unsupported. The use of the term "distinct" to characterize the distance or time period (as plaintiff suggests) is not appropriate, either, because it adds no substantive explanation of the period of

delay. The only certainty regarding the advance guidance range is that it is measured from the upcoming decision point. (The parties agree that "advance voice guidance" means "voice guidance given after the initial voice guidance and before the confirmation voice guidance and indicating that a decision point is approaching.") Accordingly, I construe "advance guidance range" as "a distance or time period measured from the upcoming decision point."

Defendant also asks the court to construe "confirmation voice guidance range" as a "pre-set distance or time period measured from the upcoming decision point." Plaintiff's construction is "decision point is within a time and/or distance-based range in which confirmation voice guidance takes place." As in the case of "advance voice guidance range," the specification does not suggest that the confirmation voice guidance range occurs within a "pre-set" distance or time. Moreover, all of the references to the confirmation voice guidance range in the specification describe it as a distance-based (not time-based) range. ("According to one embodiment, ... the confirmation voice guidance range is a distance-based range." Col. 11, lns. 31-33. "The confirmation distance is determined based on the speed category of the road, if speed category data is available. Otherwise, the confirmation distance is determined by the classification of the road. Examples of road classifications include, but are not limited to, residential roads, collector roads, arterial roads, highways, and interstates highways." Col. 14, lns. 31-36.) Accordingly, I construe "confirmation voice guidance range" to mean "a distance-based range measured from the upcoming decision point."

11. ***Provide different prompts***

Defendant asks the court to construe the following phrase in claim 38:

wherein the initial voice guidance, the advance voice guidance and the confirmation voice guidance provide different prompts to provide specific guidance when the decision point is within an initial guidance range, within an advance guidance range, and within confirmation guidance range.

Defendant proposes a construction of this phrase to link the initial voice guidance more explicitly with the initial guidance range, the advance voice guidance with the advance guidance range and the confirmation voice guidance with the confirmation guidance range. (Defendant's proposed construction is: "wherein the initial voice guidance is provided when the decision point is within the initial guidance range, the advance voice guidance is provided when the decision point is within the advance guidance range and confirmation voice guidance is provided when the decision point is within the confirmation voice guidance range.") I agree with plaintiff that the phrase is clear and unambiguous and no judicial construction is necessary.

E. U.S. Patent No. 6,222,485

Plaintiff's '485 patent relates to a method of selecting the map's orientation such that the user's desired heading appears at the top of the displayed map.

1. ***Electronic navigation device for a vehicle***

Claim 1 describes an "electronic navigation device for a vehicle ." For the reasons discussed in section C.4. above, I construe "electronic navigation device for a vehicle" as: "any electronic device designed to provide information used for in-vehicle navigation."

2. ***Thoroughfare***

This term appears throughout the '485 patent. For the reasons discussed in Section B.1 above, I construe it as "public road."

3. ***Cartographic data***

Plaintiff maintains the position that, as in its other patents discussed so far, "cartographic data" means only "map data." Defendant, however, defines it as, "data relating to maps or charts including one or more groupings of X, Y coordinates that define a road, waterway, or channel." For the reasons discussed in section C.2 above, I limit "cartographic data" to maps but not charts and as discussed in the preceding section I limit "thoroughfares" to roads only and not waterways or channels. The remaining question is whether the concept of "X and Y coordinates" should be incorporated in the definition of "cartographic data."

Defendant correctly points out that the specification of the '485 patent makes it clear that "the cartographic data is stored as separate X and Y coordinate data in memory 56." Col. 4, lns. 16-17. Moreover, "[t]he construction of the cartographic data into X and Y coordinates is typically done during the software development stage and is normally included with the prestored cartographic data." Col. 4, lns. 58-61. Also, "every thoroughfare is defined as a grouping of coordinate points which have separate X and Y coordinates." Col. 4, lns. 56-57. Defendant's proposed definition is in accordance with the specification. I construe "cartographic data" to mean "data relating to maps including one or more groupings of X, Y coordinates that define a thoroughfare."

4. ***Displays said cartographic data***

The third subpart of claim 1 reads: "a display, wherein said display displays said cartographic data." First, the parties dispute whether "display" means "graphically depict" or "show." For the reasons discussed in Section C.6 above, I construe "display" as "show." Second, the parties disagree whether the X and Y coordinates should be shown to the user. Plaintiff contends that they should not. At the claims construction hearing plaintiff argued that displaying such detail would render the invention meaningless because the display would be cluttered and incomprehensible (which is precisely what the disclosed invention seeks to avoid). Plaintiff is correct. Nothing in the claim itself or in the specification suggests that the display would show anything other than the thoroughfares; nothing suggests that the X and Y coordinates would be included in the display also. The X and Y coordinates are used by the system to process the location of the vehicle and the location of certain thoroughfares. There is no reason why the X and Y coordinates would be displayed to the user. I construe "displays said cartographic data" to mean, "shows the cartographic data including thoroughfares but excluding X and Y coordinates."

5. ***Data corresponding to one or more thoroughfares***

The fourth subpart of claim 1 reads:

wherein said processor retrieves from said memory, data corresponding to one or more thoroughfares and determines a desired orientation for display of said cartographic data based upon a current location of said vehicle, a direction of travel of said vehicle, and a direction of at least one of said one or more thoroughfares corresponding to said current vehicle location, wherein said direction of said at least one of said one or more thoroughfares is determined from said retrieved cartographic data.

The first phrase in dispute is: "wherein said processor retrieves from said memory, data corresponding to

one or more thoroughfares." Plaintiff seeks to limit the definition of "data corresponding to one or more thoroughfares" to simply "thoroughfares." Defendant has proposed the better definition, which incorporates the concept of X and Y coordinates. As discussed in section E.3 above, the specification makes it clear that this invention works by detecting thoroughfares through their corresponding coordinates. There is no question that "data corresponding to one or more thoroughfares" includes not only the thoroughfares themselves but also their corresponding coordinates. I construe "data corresponding to one or more thoroughfares" to mean "the X and Y coordinates corresponding to one or more thoroughfares."

6. ***Display of said cartographic data***

The second phrase in dispute in the fourth subpart of claim 1 is: "orientation for display of said cartographic data." The issues in dispute are the same ones presented in Section E.4. For reasons discussed in that section I construe the term as "orientation for showing said cartographic data including thoroughfares but excluding X and Y coordinates."

7. ***Direction of at least one of said ... thoroughfares***

The next phrase in dispute in the fourth subpart of claim 1 is: "direction of at least one of said one or more thoroughfares corresponding to said current vehicle location." The dispute is over the meaning of "direction." Defendant contends that plaintiff originally agreed to define the term "direction" as "the compass heading," but that after the claims construction hearing plaintiff indicated that it did not agree to this construction. Exh. 7 at 4 n. 1. Now plaintiff contends that the term "direction" requires no construction. Defendant argues that plaintiff "has waived any right to challenge this construction ["the compass heading"] by agreeing to the construction and not briefing it timely." Id. I am not persuaded by defendant's argument. Both parties' pre-hearing submissions were pretty much useless because they failed to inform the court precisely which terms were in dispute. It appeared that the parties had not met to discuss claims construction; their briefs contained only speculation as to the other party's positions, based on prior correspondence exchanged. At the claims construction hearing I ordered the parties to prepare and submit a joint list of disputed terms. That list (submitted as eight exhibits, one for each patent in dispute), dkt. # 61, is presently before the court and is the basis for this opinion. The list includes multiple disputed terms that were not presented to the court in the parties' original pre-hearing briefs. I am considering all of the terms and arguments presented in dkt. # 61, including plaintiff's position that the term "direction" requires no construction. I agree with plaintiff that the term "direction" is clear and requires no judicial construction.

8. ***Direction ... is determined from said retrieved cartographic data***

The next phrase in dispute in the fourth subpart of claim 1 is: "direction of said at least one of said one or more thoroughfares in determined from said retrieved cartographic data." I have already determined that "direction" requires no construction (section E.7) and have already construed "thoroughfare" (section E .2) and "cartographic data" (section E.3). The phrase requires no further judicial construction.

9. ***Memory having cartographic data that includes one or more thoroughfares***

Claim 6 discloses "[a]n electronic map orientation method for a *portable navigation device in a vehicle having a processor, a memory having cartographic data that includes one or more thoroughfares,* and a display, the method comprising...." The disputed phrase is underlined. The first disputed term is "portable navigation device." For the reasons discussed in sections D.1 and D.5, I construe this as "any easily transportable device designed to provide information for in-vehicle navigation." The other disputed term is

"cartographic data that includes one or more thoroughfares." Aside from their disagreement over the term "cartographic data," the parties' constructions of this term do not differ substantially. For the reasons discussed in section E.3, I construe "cartographic data that includes one or more thoroughfares" as "data relating to maps including one or more groupings of X, Y coordinates that define a thoroughfare corresponding to one or more thoroughfares."

10. ***Thoroughfares corresponding to said current vehicle location***

The third subpart of claim 6 reads:

retrieving data corresponding to a direction of one of said one or more thoroughfares corresponding to said current vehicle location, wherein said direction of said one of said one or more thoroughfares is determined from said cartographic data.

The first dispute is over the term "direction." As explained in section E.7, I have concluded that this term requires no judicial construction. The second dispute is over the phrase, "direction of said one of said one or more thoroughfares is determined from said cartographic data." The phrase "said one of said one or more thoroughfares" refers to the phrase immediately preceding it, which is, "one or more thoroughfares corresponding to said current vehicle location." The parties agree that this means "the direction (as construed by the court) of the thoroughfare (as construed by the court) on which the vehicle is traveling or most closely adjacent to the vehicle at the current vehicle location." This leaves "said cartographic data" as the only disputed term. As explained in section E.3, I construe this as "data relating to maps including one or more groupings of X, Y coordinates that define a thoroughfare."

11. ***Establishing an orientation***

The fourth subpart of claim 6 reads:

establishing an orientation of said display, based upon said retrieved data, corresponding to the direction of said one or more thoroughfares.

The first disputed term is "direction," which, as already discussed, requires no construction. The parties also ask the court to construe "cartographic data," which is curious because the term does not appear in the disputed phrase. I presume the parties are asking the court to construe "said retrieved data" as "said retrieved cartographic data," which is a reasonable construction. In keeping with my construction of "cartographic data" set forth in section E.3, I construe "said retrieved data" as "said retrieved data relating to maps including one or more groupings of X, Y coordinates that define a thoroughfare."

F. U.S. Patent No. 6,188,956

Plaintiff's patent '956 discloses an invention that limits the display to label only those thoroughfares in which the user of the vehicle is most likely to be interested.

1. ***Navigation device***

Claims 1, 5, 9, 15 and 19 describe "[a] navigation device for navigating a vehicle on a thoroughfare, said device comprising...." For the reasons discussed in section C.4 above, I construe "navigation device for navigating a vehicle" as "any device designed to provide information used for in-vehicle navigation."

2. ***Thoroughfare***

This term appears throughout the '956 patent. For the reasons discussed in section B.1 above, I construe "thoroughfare" as "public road."

3. ***Cartographic data***

This term also appears throughout the '956 patent. As was also the case in the '485 patent, defendant seeks to incorporate the concept of "X and Y coordinates" into the definition of "cartographic data." The nature of the invention is made clear in the specification and supports defendant's position. ("More particularly, it will be understood that the cartographic data is stored in memory and that each thoroughfare contains a series of coordinates (e.g., Xn, Yn). By analyzing these coordinates, the processor can determine thoroughfares which intersect with the thoroughfare being navigated." Col. 3, lns. 14-18. "Each of the thoroughfares consists of a plurality of coordinates, namely coordinates in the form of (Xn, Yn). This storage technique is conventional and will be readily understood." Col. 6, lns. 33-36. "In operation of the invention, processor 24 utilizes the coordinate data to determine the position and orientation of the various thoroughfares." Col. 6, lns. 41-44.) Accordingly, I construe "cartographic data" to mean "data relating to maps including one or more groupings of X, Y coordinates that define a thoroughfare." (For the reasons discussed in section C.2 above, I have limited the definition of "cartographic data" to maps but not charts.)

4. ***Plurality***

The first subpart of claims 1, 5, 9, 15 and 19 all begin with, "a memory containing cartographic data indicative of a plurality of thoroughfares...." The parties dispute whether "plurality" means "one or more" or "two or more." For the reasons discussed in section C.5 above I construe this phrase as: "a memory containing cartographic data indicative of two or more thoroughfares ."

5. ***Displaying said cartographic data***

The third subpart of claim 1 reads:

a display, connected to said processor, for *displaying said cartographic data,* wherein said display displays the name of each of said thoroughfares that intersects with said thoroughfare upon which said vehicle is being navigated, but does not display the name associated with said thoroughfare upon which said vehicle is being navigated.

The disputed phrase is underlined. The first term in dispute is "displaying," which I construe as "showing," as explained in section C.6 above. Next, plaintiff attempts to qualify "said cartographic data" as "map data corresponding to the geography surrounding the vehicle." Plaintiff's definition is incorrect. The term "said cartographic data" in the disputed phrase relates back to the "cartographic data" in the first subpart of claim 1, where the term is defined as "data indicative of a plurality of thoroughfares, including said thoroughfare upon which said vehicle is being navigated, wherein at least one of said thoroughfares intersects said thoroughfare upon which said vehicle is being navigated." It would be incorrect to redefine "said cartographic data" in the third subpart as plaintiff requests. Therefore, I construe the disputed phrase as "showing said cartographic data."

Similarly, where the term "displaying said cartographic data" appears in the third subpart of claim 9 and the

third subpart of claim 19, plaintiff seeks to add "corresponding to the geography of the surrounding vehicle" to the definition of cartographic data. I decline to do so because " *said* cartographic data" (emphasis added) is already defined in the first subpart of claims 9 and 19, respectively. For this reason, I construe "said cartographic data" in claims 9 and 19 as "showing said cartographic data."

6. ***Displays the name***

The next disputed term in the third subpart of claim 1 is "displays the name of each of said thoroughfares." Plaintiff defines this as "labels each of said thoroughfares" and defendant defines this as "shows every thoroughfare." I construe it as: "shows the name of each of said thoroughfares." (The same terms appears in the third subpart of claim 19 and I construe it in the same manner for purposes of claim 19). Conversely, I construe the next disputed phrase in the third subpart of claim 1, "but does not display the name associated with said thoroughfare," to mean "but does not show the name associated with said thoroughfare."

7. ***Set of thoroughfares***

The first subpart of claim 5 reads:

a memory containing cartographic data indicative of a plurality of thoroughfares, including said thoroughfare on which said vehicle is being navigated, wherein each said thoroughfare has an associated name stored in said memory, and *wherein a first set of said thoroughfares are generally aligned in a first direction, and a second set of said thoroughfares are generally aligned in a second direction*.

The disputed phrase is underlined. The parties agree that a "set" is a group. They disagree about whether the group includes *all* roads (as defendant contends) or potentially fewer than all roads (as plaintiff contends) that are aligned in a particular direction. Plaintiff is correct that nothing in the claim language or in the specification indicates that *all* roads of a particular alignment must be included in the group. However, plaintiff attempts to characterize the thoroughfares as those "within the graphically depicted geography surrounding the vehicle." Nothing in the claim indicates that this is an appropriate limitation. Although ultimately, as the specification makes clear, what will be shown to the user are those roads surrounding the vehicle, there is no justification for importing this limitation into the first subpart of claim 5, which is generally describing the thoroughfares stored in memory. I construe the disputed phrase to mean: "wherein thoroughfares aligned in one direction comprise the first group of said thoroughfares and thoroughfares aligned in a different direction comprise the second group of said thoroughfares."

8. ***Displays images indicative of said thoroughfares***

The third subpart of claim 5 reads:

a display, connected to said processor, wherein said display *displays images indicative of said thoroughfares* and displays the names of each thoroughfare in a selected one of said sets of thoroughfares.

The disputed phrase is underlined. Defendant contends that aside from the terms "display" and "thoroughfare," this phrase needs no construction. On the other hand, plaintiff again seeks to characterize the thoroughfares as those "in the geography surrounding the vehicle." As explained in section F.5, I decline to add this limitation to the claim. I do agree with plaintiff, however, that the words "indicative of" are unnecessary. Accordingly, I construe "displays images indicative of said thoroughfares" as "shows the thoroughfares."

9. ***Displays the name***

The next disputed phrase in the third subpart of claim 5 is: "displays the names of each thoroughfare in a selected one of said sets of thoroughfares." Aside from construing "display" as "show," I find that this phrase is clear and requires no judicial construction. The constructions proposed by each party amount to little more than word changes that do not render the phrase any clearer than it already is. (Plaintiff proposes: "labels each of the public roads in one of said sets of public roads." Defendant proposes: "shows the name of every road, waterway or channel in one of the first and second sets and never the name of any other road, waterway or channel).

10. ***Each said thoroughfare ... intersects***

Claim 6 reads:

The navigation device as set forth in claim 5, *wherein each said thoroughfare in said first set of thoroughfares intersects said thoroughfare upon which said vehicle is being navigated,* and wherein said selected one of said sets is said first set.

The disputed phrase is underlined. Plaintiff contends that the only construction necessary is for "thoroughfare." Defendant's proposed construction ("every road, waterway, and channel in the first set crosses the road, waterway or channel on which the car is traveling") amounts to unnecessary and unsubstantial rewording of the claim language. In particular, defendant seeks to replace the word "each" with "every." The claim language is clear as written. Aside from construing "thoroughfare," I leave the claim language undisturbed.

11. ***Thoroughfares intersect***

Claim 9 describes "[a] navigation device for navigating a vehicle on a thoroughfare, said device comprising...." The first subpart of claim 9 reads:

a memory containing cartographic data indicative of a plurality of thoroughfares, including said thoroughfare upon which said vehicle is being navigated, *wherein a first set of said thoroughfares intersects with the thoroughfare upon which said vehicle is being navigated,* and a second set of thoroughfares do[es] not intersect with the thoroughfare upon which said vehicle is being navigated, wherein each said thoroughfare has an associated name stored in said memory.

The first disputed phrase is underlined. Plaintiff's proposed construction is:

a first group of public roads within the graphically depicted geography surrounding the vehicle, that cross the public road upon which the vehicle is traveling.

Defendant's proposed construction is:

all roads, waterways, and channels that cross the road, waterway, or channel on which the vehicle is traveling.

The primary difference in the parties' proposed constructions is that defendant includes language to clarify

that *all* of the thoroughfares in the first set intersect. Defendant is correct. If certain thoroughfares are being grouped together because they share the characteristic of intersection with the road on which the vehicle is traveling, then it follows that *all* of them intersect. For the reasons explained in section F.5 above, I reject plaintiff's added limitation of "within the graphically depicted geography surrounding the vehicle." Accordingly, I construe the disputed phrase as: "wherein all of the thoroughfares in a first set of said thoroughfares intersect with the thoroughfare upon which said vehicle is being navigated."

The second disputed phrase in the first subpart of claim 9 is: "a second set of thoroughfares do[es] not intersect with the thoroughfare upon which said vehicle is being navigated." The parties advance the same arguments discussed in the paragraph above and I find that no additional discussion is necessary. I construe the disputed phrase as: "None of the thoroughfares in a second set of thoroughfares intersect with the thoroughfare upon which said vehicle is being navigated."

12. ***Displays the name of each said thoroughfare***

The third subpart of claim 9 reads:

a display, connected to said processor, for displaying said cartographic data, wherein said display *displays the name of each said thoroughfare* in said first set, but does not display the name associated with the thoroughfares in said second set.

The disputed phrase is underlined. Besides construing "display" and "thoroughfare," which I have already done, I find that this phrase requires no additional judicial construction. Defendant's primary argument is that the word "each" should be replaced with "every," but this is unnecessary because "each" already implies that *all* of the thoroughfares are named.

Conversely, I agree with defendant that in the next disputed phrase in the third subpart of claim 9, "but does not display the name associated with the thoroughfares in said second set," the words "any of" should be inserted to make it clear that *no* names of any thoroughfares in the second set are displayed. Accordingly, I construe this disputed phrase as: "but does not display the name associated with any of the thoroughfares in said second set."

13. ***Thoroughfares that are oriented***

Claim 15 describes "[a] navigation device for navigating a vehicle on a thoroughfare, in a first direction, said device comprising...." The third subpart of claim 15 reads:

a display, connected to said processor, for displaying said cartographic data, wherein said display *displays the name of selected thoroughfares that are oriented in a direction other than the direction said vehicle is being navigated*.

The disputed phrase is underlined. Plaintiff's proposed construction ("labels the chosen public roads") says too little, deleting important portions of the claim language. On the other hand, defendant's proposed construction says too much:

shows the name of all the roads, waterways, and channels aligned in a particular direction other than the direction of the road, waterway or channel in which the vehicle is traveling while never showing the roads, waterways, and channels that are aligned in the particular direction of the road, waterway, or channel in

which the vehicle is traveling.

I find that the claim language is clear as written and requires no judicial construction (aside from the terms "display" and "thoroughfare"). Defendant's suggestion that *all* thoroughfares that are oriented in a direction other than the direction said vehicle is being navigated will be displayed is unsupported by the claim language and the specification. In more than one instance, the specification makes it clear that in order to avoid a cluttered display, certain thoroughfares will be selected out and their names will not be displayed (for example: "When a collision event is declared, the processor will default to display the name of the road which is in the lowest classification, where the lowest classification consists of the most major type of thoroughfare." Col. 3, lns. 57-61.). There is no justification for defendant's attempt to add language specifying that the depiction will not display the names of thoroughfares that are aligned in the direction of the thoroughfare in which the vehicle is traveling. Such a limitation to the claim language is unnecessary. Although it is true that the specification explains that such thoroughfares will not be named, it is not the court's job to incorporate every disclosure of the specification into a claim that does not include them.

14. ***At least one of said thoroughfares***

Claim 19 describes [a] navigation device for navigating a vehicle on a thoroughfare, said device comprising...." The first subpart of claim 19 reads:

a memory containing cartographic data indicative of a plurality of thoroughfares, including said thoroughfare upon which said being is being navigated, wherein *at least one of said thoroughfares intersects with said thoroughfare* upon which said vehicle is being navigated, and wherein each of said thoroughfares has an associated name stored in memory.

Although the parties identified this phrase for construction, it appears that their only dispute in over the term "thoroughfare." Having already construed this term, I find that the remainder of the phrase is unambiguous and requires no judicial construction.

15. ***Does not display the name associated***

The third subpart of claim 19 reads:

a display, connected to said processor, for displaying said cartographic data, wherein said display displays the name of each of said thoroughfares that intersects with said thoroughfare upon which said vehicle is being navigated, but *does not display the name associated with thoroughfares that do not intersect the thoroughfare upon which said vehicle is being navigated*.

The disputed phrase is underlined. I find that the phrase is unambiguous. Neither party has proposed substantive changes to the claim language. Aside from construing the terms "display" and "thoroughfare," I find that no judicial construction is necessary.

G. U.S. Patent No. 5,291,412

Defendant's '412 patent addresses a navigation system that allows users to input preferences regarding a new route to be calculated after the user deviates from the original route. In particular, the system allows the user to choose whether the new route will include U-turns to send the user back to the original route.

1. ***Optimal route***

Claim 1 discloses "[a] navigation system, which comprises...." The fourth subpart of claim 1 reads:

means for computing, in accordance with said map data, an original optimal route from a starting point to a destination.

The parties agree that the function of the fourth subpart of claim 1 is: computing, in accordance with said map data, an original optimal route from a starting point to a destination. However, the parties disagree on the meaning of the term "optimal route" and on the corresponding structure. Defendant urges the court to give "optimal route" its plain and ordinary meaning, which according to defendant is, "a route that is most favorable or desirable, optimum ." Plaintiff defines "optimal route" in accordance with what is revealed in the specification as: "a course of travel such that the amount of time or distance is least or that requires the fewest number of turns." Plaintiff has the better definition. The specification makes it clear that "[t]he optimal route is computed to make the amount of time or distance from a starting point to a destination be least or to require the fewest number of right and left turns." '412 pat., col. 4, lns. 51-54. I construe "optimal route" (in this claim and wherever it appears throughout the '412 patent) as: "a course of travel such that the amount of time or distance from a starting point to a destination is least or requires the fewest number of turns."

The parties' primary dispute concerning the corresponding structure is whether the software instructs the computer to perform two or three steps. Defendant maintains that the only associated steps are "read in the present location" and "compute the optimal route." Plaintiff argues that there is an intervening step between these two: "read in a destination entered by the user." Plaintiff is wrong. Performing the step "read in a destination entered by the user" enables the system to operate, but goes beyond what is strictly necessary to perform the claimed function. Plaintiff is correct, however, that the first step should not be "read in the *present location,*" as defendant contends, but rather, "read in the starting point," to account for the fact that the optimal route may be calculated either from the present location or from any other starting point the user inputs ("If input of a starting location is omitted, the starting location is derived from dead reckoning or external inputs such as, for example, GPS or Loran." Col. 4, lns. 7-9). The parties' last disagreement (which pervades each disputed structure in defendant's three patents) is whether the word "step" should be included so that the opening phrase of the description of the corresponding structure reads: "optimal route computer 40 with associated software instructions to perform the following steps...." Defendant argues that the use of the word "steps" "introduce[s] an additional functional limitation." Dft.'s Br., dkt. # 63 at 2. Defendant's concern is unjustified. The word does not add any limitations, but simply makes clear that the software instructions instruct the computer to perform one or more actions. I conclude that the corresponding structure is:

optimal route computer 40 with associated software instructions to perform the following steps: 1) read in the starting point; and 2) compute the original optimal route.

2. ***New optimal route***

The fifth subpart of claim 1 reads:

said means for computing being also effective for computing, in accordance with said map data, a new optimal route from said present location of said vehicle to said destination.

The parties agree that the function is: computing, in accordance with said map data, a new optimal route from said present location of said vehicle to said destination. Their disagreement concerns the corresponding structure. Plaintiff's proposed structure includes multiple enabling steps that are not necessary to perform the claimed function. Defendant's proposed structure more accurately captures the essence of what is required to perform the associated function (compute an optimal route that avoids U-turns or compute an optimal route that allows U-turns). I find it unnecessary, however, to describe the corresponding structure as two separate structures, as defendant proposes. The corresponding structure is in fact one single software, which contemplates multiple actions. Therefore, I construe the structure to be:

optimal route computer 40 with associated software instructions to perform the following steps: 1) read in the present location and 2) compute a new optimal route that either avoids or eliminates U-turns or that allows U-turns.

3. ***Detecting deviation***

The seventh subpart of claim 1 reads:

means for detecting whether said vehicle has deviated from one of said original and said new optimal routes.

The agreed upon function is: detecting whether the vehicle has deviated from either the original or the new optimal route. The only dispute concerns whether the corresponding structure's software instructs the computer only to read the present location and determine whether the vehicle has deviated, or whether the software also instructs the computer to "determine location of roads stored as part of the original or new optimal route," as plaintiff contends. Plaintiff's suggestion consists of an enabling step that should not be included in the structure. I construe the corresponding structure as:

optimal route computer 40 with associated software instructions to perform the following steps: 1) read in the vehicle's present location and 2) determine whether the vehicle departed from the optimal route it was traveling (either the original optimal route or the new optimal route).

4. ***Means for directing***

The eighth subpart of claim 1 reads:

means for directing said means for computing to select one of allowing U-turns and preventing U-turns in following one of said original and said new optimal routes from said present locations.

The parties agree on the structure but disagree on the function. Plaintiff proposes the following:

after the vehicle deviates from said original optimal route, instructing the optimal route computer to either allow retracement and following of the original optimal route to the destination or prevent retracement of the original optimal route and follow a new optimal route to the destination.

Defendant proposes the following:

directing the means for computing to select one of allowing U-turns and preventing U-turns in following one of the original and the new optimal routes from the present location.

The parties' proposals differ in two significant respects. First, plaintiff adds the language "after the vehicle deviates from said original optimal route." Defendant is correct, dkt. # 54, at 26, that "[n]othing in the claim language requires limiting the claim in this manner." Although it may be true that the system *implements* the user's selection of preventing or allowing U-turns only after the vehicle deviates from the optimal route, neither the claim language or the specification restricts the timing of the user's *selection* to post-deviation. In fact, the specification suggests that the user may select her U-turn preference upon turning on the device (*see, e.g.,* col. 4, lns. 15-18). Next, plaintiff broadens the concept of U-turns into the concept of "retracement." Plaintiff is correct that when U-turns are permitted, the system calculates a route to return the user to the original route from which the user deviated. In this instance, the original route will be retraced. However, the original route may be retraced in other ways, that do not involve making U-turns. I cannot broaden the claim language to include scenarios not contemplated in the original claim language or in the specification. The specification is concerned strictly with U-turns and not with other forms of maneuvers and detours. I find that the claim language is unambiguous and construe the function to closely follow it:

directing the means for computing to select one of allowing U-turns and preventing U-turns in following one of the original and the new optimal routes from the present location.

5. *Selectively allowing*

Claim 13 describes "[a] method of navigating a vehicle, which comprises the steps of ...." The seventh subpart of claim 13 reads:

said step of displaying selectively allowing and prohibiting the display of said route guidance information that returns said vehicle to an original optimal route.

The parties dispute the construction of this phrase. Defendant construes it as:

selecting whether to allow or, alternatively, to avoid or eliminate the display of route guidance information that leads the vehicle back to an original optimal route.

Plaintiff construes it as:

obtaining user instruction, after deviation from the original optimal route, to allow or prohibit display of guidance information returning the vehicle to the original optimal route.

In this instance, plaintiff's insertion of "after deviation from the original optimal route" is appropriate because it is necessarily the case that a display that might conceivably return a vehicle to an original optimal route would be shown only *after* a vehicle has deviated from said original optimal route. Adding this phrase clarifies the claim language without inserting inappropriate limitations. However, plaintiff's proposed addition of "obtaining user instruction" is inappropriate because it goes beyond the tasks identified in the claim language. The claim states only that the display sometimes shows route guidance information leading the vehicle back to the optimal route and sometimes does not show route guidance information leading the vehicle back to the optimal route. The claim language is silent as to the process for deciding whether to show the information or where to obtain instructions. I construe the claim as:

said step of displaying, after deviation from the original optimal route, sometimes allowing and sometimes

prohibiting the display of said route guidance information that returns said vehicle to an original optimal route.

6. ***Information leading to U-turns***

Claim 14 reads:

A method according to claim 13, wherein the step of displaying includes *selectively allowing and prohibiting display of said route guidance information leading to U-turns in following said new optimal routes from said present location*.

The disputed phrase is underlined. The parties' dispute is identical to the dispute presented in section G.5 immediately above (whether to insert "obtaining user instruction, after deviation from the original optimal route," as plaintiff requests). For the reasons discussed in that section, I construe the disputed phrase as:

after deviation from the original optimal route, sometimes allowing and sometimes prohibiting display of said route guidance information leading to U-turns in following said new optimal routes from said present location.

H. U.S. Patent No. 5,550,538

Defendant's patent '538 discloses systems to calculate restoration routes back to an original route after the user deviates from said original route.

1. ***Optimal route***

Claims 1, 5, 6 and 7 disclose "[a] navigation system comprising...." The second subpart of each of these claims reads:

first computing means for computing an optimal route for said vehicle from a starting point to a destination.

The parties agree that the function of this means-plus-function claim is: computing an optimal route for the vehicle from a starting point to a destination. They dispute the meaning of "optimal route." As was the case in the context of the '412 patent (section G.1), defendant urges the court to give "optimal route" its plain and ordinary meaning, which according to defendant is, "a route that is most favorable or desirable, optimum." Plaintiff defines "optimal route" in accordance with what is revealed in the specification as: "a course of travel from a starting point to a destination such that the amount of time or distance is least." Plaintiff has the better definition. The specification states that "[t]he optimal route is computed so that either the distance or the time to travel (from the starting point to the destination) is minimized." '538 pat., col. 3, lns. 29-31. I construe "optimal route" (in this claim and wherever it appears throughout the '538 patent) as: "a course of travel from a starting point to a destination such that the amount of time or distance is least."

Next, the parties dispute the corresponding structure, although their dispute is inconsequential. The only substantive disagreement is whether the word "step" should be included so that the opening phrase of the description of the corresponding structure reads: "a microcomputer 1 with associated software instructions to perform the following steps....." For the reasons discussed in section G.1, I will include the word "steps" in the definition of each structure I construe throughout this patent. Accordingly, I construe the corresponding structure as:

a microcomputer 1 with associated software instructions to perform the following steps: 1) read information of the destination and the starting point; 2) read map information; and 3) compute an optimal route.

2. ***Means for selecting***

The third subpart of claims 1, 5, 6, and 7 reads: "first means for selecting a first plurality of marked points on said optimal route." The parties agree on the function: selecting a first plurality of marked points on the optimal route. Their only dispute regarding the corresponding structure is whether to include the word "step"; no discussion is necessary. I construe the corresponding structure to be:

a microcomputer 1 with associated software instructions to perform the step of setting marked points.

3. ***Restoration point***

The fourth subpart of claims 1, 5, 6, and 7 reads:

said first plurality of marked points being used for determining a restoration point between said destination and a deviation point.

Plaintiff argues that "restoration point" means "an intersection at which the vehicle is restored to said optimal route." Defendant's position is that the term needs no construction. I agree with plaintiff's definition, which is in keeping with the claim language and the specification. For instance, the "summary of the invention" appearing in the specification states: "When an off-route deviation is detected, the system computes a restoration route from the vehicle's present position to a selected point on the optimal route ...." '538 pat., col. 1, lns. 44-46. Moreover, plaintiff is correct in its analysis, dkt. # 56, at 46, that "if the restoration point were not an intersection, a vehicle would be unable to return to the original route, which is the express intent of the '538 patent." Accordingly, I construe "restoration point" as "an intersection at which the vehicle is restored to said optimal route."

4. ***Off-route detection means***

The fifth subpart of claims 1, 5, 6, and 7 reads: "off-route detection means for detecting a deviation of said vehicle from said optimal route." The parties agree that the function is: detecting a deviation of the vehicle from the optimal route. Their dispute concerning the corresponding structure is whether the software instructions instruct the system to read only the present location of a vehicle and detect whether vehicle has deviated from the optimal route or also to "compare said present location to the optimal route," as plaintiff proposes. Plaintiff's proposal is unwarranted because this added step ("compare said present location to the optimal route") enables the system to operate, but goes beyond what is strictly necessary to perform the claimed function. Accordingly, I construe the corresponding structure as:

a microcomputer 1 with associated software instructions to perform the following steps: 1) read in the present location of a vehicle; and 2) detect whether the vehicle has deviated from the optimal route.

5. ***Selecting a restoration point***

The seventh subpart of claim 1 reads:

second means for selecting one of said first plurality of marked points disposed between a point at which said deviation occurs and said destination, as a restoration point when said off-route detection means detects said deviation.

The parties agree as to function: Selecting one of the first plurality of marked points disposed between a point at which the deviation occurs and the destination, as a restoration point when the off-route detection means detects the deviation. The dispute concerns the corresponding structure. The key parts of plaintiff's proposed construction, which I do not recite here in its entirety, are: "obtaining first plurality of marked points disposed between a deviation point and said destination" and "implement an undisclosed route-calculation algorithm to compute two or more distinct courses of travel between the current position and two or more intersections along the optimal route." Plaintiff's assertion that there is "an undisclosed route-calculation algorithm" is unfounded and contradicted by the specification. Defendant's proposed construction, which I adopt in large part, "encompasses all structure in the specification corresponding to that element." Micro Chemical, 194 F.3d at 1258. The three possible ways of calculating the restoration point are described in the specification. Col. 4, lns. 39-42; col. 4, lns. 61-64; col. 5, lns. 9-13. The corresponding structure is:

A microcomputer 1 with associated software instructions to perform one or more of the following steps and select a restoration point corresponding to the optimal restoration route: 1) determine a restoration point that is nearest (in terms of straight distance) to a present position from among the marked points that fall between the point of deviation and the destination; or 2) determine a restoration point as the marked point between the deviation point and the destination that is spaced a predetermined number of marked points or a predetermined distance from the marked point that is nearest to the present position; or 3) determine a restoration point as the marked point between the deviation point and the destination that is spaced a predetermined number of marked points or a predetermined distance from the deviation point; or 4) determine a restoration point from among the marked points that fall between the point of deviation and the destination by computing the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points and selecting as the restoration point the marked point corresponding to the optimal restoration route.

The parties raised their dispute concerning the term "optimal restoration route" for the first time in the context of the eighth subpart of claim 1 so I discuss it in the section below. My construction of the term in that context applies to the term wherever it appears in the patent, including this seventh subpart of claim 1.

6. *Computing an optimal restoration route*

The eighth subpart of claim 1 reads:

said second means for selecting including second *computing means for computing an optimal restoration route from a plurality of restoration routes each extending from said present position to one of said first plurality of marked points disposed between a deviation point and said destination.*

The phrase in dispute is underlined. The parties agree on the function (they appear to have resolved their arguments, advanced vehemently in their pre-hearing briefs and at the claims construction hearing, concerning the Kirson and Lefebvre prior art and whether there exists a *plurality of restoration routes to a plurality of restoration points* from which an optimal restoration route will be chosen): computing an optimal restoration route from a plurality of restoration routes that each extend from the present position to

one of the first plurality of marked points disposed between a deviation point and the destination. First, the parties dispute the meaning of "optimal restoration route." Plaintiff defines it as:

An optimal course of travel between the current position and an intersection at which the vehicle is restored to said optimal route.

Defendant defines it as:

a course of travel between the present position of the vehicle and a marked point on the optimal route between the destination and the deviation point that is most favorable or desirable, optimum.

Neither party suggests that "optimal restoration route" should incorporate the definition of "optimal route," which incorporates the concept of the shortest time or distance. Indeed, the definition of "optimal restoration route" should not incorporate the definition of "optimal route" because nothing in the claim language or in the specification suggests that the "optimal restoration route" involves the "shortest time or distance." Nothing in the claim language or in the specification defines the term "optimal restoration route" so I resort to the plain and ordinary meaning of "optimal," which is "the most favorable or desirable." *Webster's College Dictionary* 927 (2d ed.1999). Accordingly, I construe "optimal restoration route" as: "the most favorable or desirable course of travel between the current position of the vehicle and the restoration point."

The parties' second dispute concerns the corresponding structure. As was the case in section H.5 immediately above, the key portions of plaintiff's proposed construction, which I do not recite here in its entirety, are: "obtaining first plurality of marked points disposed between a deviation point and said destination" and "implement an undisclosed route-calculation algorithm to compute two or more distinct courses of travel between the current position and two or more intersections along the optimal route." Plaintiff's repeated assertion that there is "an undisclosed route-calculation algorithm" is unfounded and contradicted by the specification. Defendant's proposed construction, which I adopt in large part, encompasses each of the corresponding structures disclosed in the various embodiments in the specification. The corresponding structure is:

A microcomputer 1 with associated software instructions to perform one or more of the following steps and select an optimal restoration route: 1) compute the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points between the deviation point and the destination which are nearer to the present position than the other marked points; 2) compute the optimal restoration route from a plurality of restoration routes from the present position to one marked point between the deviation point and the destination that is spaced at a distance from another marked point that is nearest to the present position; 3) compute the optimal restoration route from a plurality of restoration routes from the present position to one marked point between the deviation point and the destination that is spaced at a distance from the deviation point; 4) compute the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points which are within a specified distance from the marked point that is nearest to the present position; and 5) compute the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points which are within a specified distance from the deviation point.

7. *Said first means for selecting*

Dependent claim 2 reads:

A navigation system according to claim 1, wherein said first *means for selecting selects said first plurality of marked points from a set consisting essentially of intersections on said optimal route*.

The parties agree on the function: selecting the first plurality of marked points from a set consisting essentially of intersections on the optimal route. The parties' sole dispute pertaining to the corresponding structure is a matter I have already addressed: whether to include the word "step." I concluded in section H.1 that it is appropriate to include the word. Therefore, the corresponding structure is:

The microcomputer 1 with additional associated software instructions to perform the following step: select most or all of the marked points on the optimal route from intersections.

8. ***Arbitrary points***

Dependent claim 3 reads:

A navigation system according to claim 1, wherein said first means for selecting selects said first plurality of marked points from a set consisting essentially of predetermined intervals on said optimal route.

The function is not disputed: selecting the first plurality of marked points from a set consisting essentially of predetermined intervals on the optimal route. The only substantive dispute pertaining to the corresponding structure is whether to include the word "arbitrary." The parties' almost identical suggested phrasing reads:

The microcomputer 1 with additional associated software instructions to perform the following step: select most or all of the marked points on the optimal route from [arbitrary] points located at equal intervals on the optimal route.

Defendant's request to include the word "arbitrary" finds no support in the claim language or the specification. On the contrary, the specification explains how the predetermined intervals are arrived at. Col. 4, lns. 61-67, col. 5, lns. 1-13. Accordingly, I adopt the parties' definition of the corresponding structure, including the word "step" but excluding the word "arbitrary."

9. ***Said second selecting means***

Dependent claim 4 reads:

A navigation system according to claim 1, wherein: said second selecting means selects as said restoration point a one of said first plurality of marked points that is nearest to said present position.

The agreed upon function is: selecting as the restoration point one of the first plurality of marked points that is nearest to the present position. The dispute is over the corresponding structure. Plaintiff's proposed construction is:

The microcomputer 1 with additional associated software instructions to perform the following step: implement the second computing means wherein the selected restoration route ends at the marked point nearest to the present position, which is selected as the restoration point.

This construction overreaches and is incorrect. Claim 4 relates to the seventh subpart of claim 1, which does not include the "second computing means." I cannot import this limitation into claim 4 when it does not appear in the corresponding subpart of claim 1. Aside from that, the parties essentially agree on what constitutes the corresponding structure. I adopt defendant's construction almost verbatim:

The microcomputer 1 with additional associated software instructions to perform the following step: select from the first set of marked points the point nearest to the present position (as defined herein) as the restoration point.

10. ***Second means for selecting***

Claims 5, 6 and 7 disclose "[a] navigation system, comprising...." The seventh subpart of claims 5, 6 and 7 reads: "second means for selecting said restoration point from said first plurality of marked points." The agreed upon function is: selecting the restoration point from the first plurality of marked points. This function is identical to the function associated with the seventh subpart of claim 1 discussed in section H.5 above. The parties make the same arguments they made in that context, and I construe the corresponding structure in identical fashion as:

A microcomputer 1 with associated software instructions to perform one or more of the following steps and select a restoration point corresponding to the optimal restoration route: 1) determine a restoration point that is nearest (in terms of straight distance) to a present position from among the marked points that fall between the point of deviation and the destination; or 2) determine a restoration point as the marked point between the deviation point and the destination that is spaced a predetermined number of marked points or a predetermined distance from the marked point that is nearest to the present position; or 3) determine a restoration point as the marked point between the deviation point and the destination that is spaced a predetermined number of marked points or a predetermined distance from the deviation point; or 4) determine a restoration point from among the marked points that fall between the point of deviation and the destination by computing the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points and selecting as the restoration point the marked point corresponding to the optimal restoration route.

11. ***Second computing means***

The eighth subpart of claims 5, 6 and 7 reads:

second computing means for computing an optimal restoration route from said present position to said restoration point on said optimal route when said off-route detection means detects said deviation.

The agreed upon function is: computing an optimal restoration route from the present position to the restoration point on the optimal route when the off-route detection means detects the deviation. Although plaintiff contends that the corresponding structure involves an "undisclosed route calculation algorithm," I find that defendant has correctly identified each of the steps (all of which are disclosed in the specification) necessary to compute an optimal restoration route. Adopting much of the language proposed by defendant, I construe the corresponding structure as:

A microcomputer 1 with associated software instructions to perform one or more of the following steps and compute an optimal restoration route: 1) compute the optimal restoration route from the present position to the marked point that is nearest to the present position; 2) compute the optimal restoration route from a

plurality of restoration routes, each extending from the present position to one of a group of selected marked points which are nearer to the present position than the other marked points; 3) compute the optimal restoration route from the present position to one marked point that is spaced at a distance from another marked point that is nearest to the present position; 4) compute the optimal restoration route from the present position to one marked point between the deviation point and the destination that is spaced at a distance from the deviation point; 5) compute the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points which are within a specified (or predetermined) distance from the marked point that is nearest to the present position; 6) compute the optimal restoration route from a plurality of restoration routes, each extending from the present position to one of a group of selected marked points which are within a specified (or predetermined) distance from the deviation point.

12. ***Further selects a second plurality***

The ninth subpart of claim 5 reads:

said second selecting means further selects a second plurality of marked points from said first plurality of marked points, said second plurality of marked points being nearer in a straight distance to said present position than are other members of said first plurality of marked points.

The agreed upon function is: selecting a second plurality of marked points from the first plurality of marked points, the second plurality of marked points being nearer in a straight distance to the present position than are other members of the first plurality of marked points. The dispute is over the corresponding structure. Defendant proposes:

The microcomputer 1 with additional associated software instructions to perform the following: select a second plurality of marked points from the first plurality of marked points which are nearer to the present position than the other marked points.

Defendant's proposed structure is flawed because it consists of nothing more than a recitation of the function; it does not disclose steps revealed in the specification to accomplish the function. In fact, the specification is completely silent regarding the selection of *a second plurality*. The excerpt defendant cites in support of its position, dkt. # 54, at 61, is not on point (col.4, lns.61-65). Accordingly, I must adopt a construction similar to plaintiff's: "Microcomputer 1 with associated software instructions to perform one or more undisclosed steps."

13. ***Second computing means***

The tenth subpart of claims 5, 6 and 7 reads:

said second computing means determines an optimal restoration route from a plurality of restoration routes each extending from said present position to each of said second plurality of marked points.

The agreed upon function is: determining an optimal restoration route from a plurality of restoration routes each extending from the present position to each of the second plurality of marked points. Defendant's proposed construction suffers from the same infirmities discussed above; it is a mere recitation of the function. Again, the excerpt defendant cites in support of its position, dkt. # 54, at 62 is not on point (col.4, lns.65-col.5, lns.1-8). Accordingly, I must adopt a construction similar to plaintiff's: "Microcomputer 1 with

associated software instructions to perform one or more undisclosed steps."

14. ***Further selects a second plurality***

The ninth subpart of claim 6 reads:

said second selecting means further selects a second plurality of marked points from said first plurality of marked points, said second plurality of marked points comprising all marked points within a specified distance from a one of said first plurality of marked points that is nearest said present position.

The function is undisputed: selecting a second plurality of marked points from the first plurality of marked points, the second plurality of marked points including all marked points within a specified distance from one of the first plurality of marked points that is nearest the present position. Because defendant has not identified any corresponding structure revealed in the specification, I construe the structure as: "Microcomputer 1 with associated software instructions to perform one or more undisclosed steps."

15. ***Second selecting means***

The ninth subpart of claim 7 reads:

said second selecting means further selects a second plurality of marked points from said first plurality of marked points, said second plurality of marked points comprising all marked points within a specified distance from said deviation point.

The undisputed function is: selecting a second plurality of marked points that include all the marked points within a specified distance from the deviation point. Again, because defendant has not identified any corresponding structure revealed in the specification, I construe the structure as: "Microcomputer 1 with associated software instructions to perform one or more undisclosed steps."

I. U.S. Patent No. 5,922,042

Defendant's patent '042 discloses a system for deciding whether to resume route guidance when the vehicle is next turned on before the vehicle shuts down.

1. ***Routine***

The term "routine" appears throughout the disputed claims of patent '042. Plaintiff maintains that it means "software instructions or algorithm." Defendant defines it as "a set of procedures or programmed instructions." The term is not defined in the specification. However it is clear from the claim language itself that it means "a set of procedures for providing route guidance" and I construe it in this manner.

2. ***Determining whether to resume guidance***

Claim 11 discloses, "[a]n apparatus for providing route guidance to a user of a navigation system for a vehicle, the apparatus comprising...." The second subpart of claim 11 reads:

means for determining, in response to detecting the impending powering down of the vehicle and before a next powering down of the navigation system, whether to resume a route guidance routine in response to a

next powering up of the vehicle based on a current position of the vehicle and a user-selected destination.

The agreed upon function is: determining, in response to detecting the impending power-down of the vehicle and before a next powering down of the navigation system, whether to resume a route guidance routine in response to a next powering up of the vehicle based on a current position of the vehicle and a user selected destination. The corresponding structure that plaintiff suggests includes steps (such as proposed step 2: "determining whether the system is currently performing route guidance") that enable the system to operate, but go beyond what is strictly necessary to perform the claimed function. Defendant's proposed structure, on the other hand, narrows in on what is strictly necessary to perform the claimed functions. The steps identified by defendant correspond with what is disclosed in the specification (col. 5, lns. 66-67; col. 6, lns. 1-7; col. 6, lns. 13-21). I adopt much of defendant's language in the construction of the corresponding structure:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) with associated software instructions to perform the following steps: 1) determine whether a power-down has been detected and determine whether to set a resume indicator based on information related to current position and destination store in memory; 2) determine whether a power-down has been detected and determine whether to set a resume indicator based on the actual distance along the route from the current position of the vehicle to the selected destination; 3) determine whether a power-down has been detected and determine whether to set a resume indicator based on the direct distance from the current position of the vehicle to the selected destination; 4) determine whether a power-down has been detected and determine whether to set a resume indicator based on both direct distance from the current position of the vehicle to the selected destination and the actual distance along the route from the current position of the vehicle to the selected destination.

3. ***Means for determining***

Dependent claim 13 reads:

An apparatus according to claim 11, wherein the means for determining comprises means for deciding whether to resume the guidance routine based on a distance along the current route from the current position of the vehicle to the user-selected destination.

The parties agree on the function: deciding whether to resume the guidance routine based on a distance along the current route from the current position of the vehicle to the user-selected destination. They dispute the corresponding structure. Plaintiff's proposed construction includes enabling steps not appropriately included in the structure. Defendant's proposal includes only those steps directly linked to the function and revealed in the specification (col. 5, lns. 65-67; col. 6, lns. 1-21). I adopt defendant's construction with one substantive exception. I do not include the term "actual distance" (I use "distance" only) because adding "actual" would be adding a limitation not included in the claim language. The specification makes it clear that the system computes *both* actual driving distance and direct distance. Col. 6, lns. 22-25. I construe the corresponding structure to be:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) with associated software instructions to perform the following step: determine whether to set a resume indicator based on the distance along the route from the current position of the vehicle to the selected destination.

4. ***Means for checking***

Dependent claim 15 reads:

An apparatus according to claim 14, wherein the means for determining further comprises means for storing a flag in the memory, the flag corresponding to an output of the means for determining, the apparatus further comprising *means for checking a status of the flag in response to the next powering up of the navigation system to determine whether to resume outputting information to the user in navigating the vehicle*.

I have underlined the disputed phrase. The parties agree on the function: checking a status of the flag in response to the next powering up of the navigation system to determine whether to resume outputting information to the user for assisting the user in navigating the vehicle. The parties' only dispute concerning the corresponding structure is insignificant (whether to include the word "step"). I construe the structure as:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) with associated software instructions to perform the following step: check the flag when the navigation system is powered-up next.

5. ***Means for recalling***

Dependent claim 16 reads:

An apparatus according to claim 14, further comprising means for recalling, in response to the next powering up of the navigation system, the user-selected destination and the current route of the vehicle from the memory and resuming the route guidance routine, if the status of the flag indicates a decision was made to resume the route guidance routine.

The function is undisputed: recalling, in response to the next powering up of the navigation system, the user-selected destination and the current route of the vehicle from the memory and resuming the route guidance, if the status of the flag indicates a decision was made to resume the route guidance routine. The dispute concerning the corresponding structure is insignificant again; the parties disagree only whether to include the word "steps." I construe the structure as:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) and audio output controller 15 and speaker 16 and/or display controller 17 and display 18, with associated software instructions to perform the following steps: recall, in response to the next powering up of the navigation system, the user-selected destination and the current route of the vehicle from the memory and resume the route guidance routine.

6. ***Resume the guidance routine***

Dependent claim 15 reads:

An apparatus according to claim 12, wherein the means for determining comprises means for deciding whether to resume the guidance routine based on a distance from the current position of the vehicle to the user selected destination.

The function is not disputed: deciding whether to resume the guidance routine based on a distance from the current position of the vehicle to the user selected destination. The parties disagree as to the corresponding structure. Defendant has the better proposal because plaintiff's suggested construction includes enabling

steps that are not directly linked to the disclosed function. I adopt a construction of the structure similar to defendant's:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) with associated software instructions to perform one or more of the following steps: 1) determine whether to set a resume indicator based on the actual distance along the route from the current position of the vehicle to the selected destination; 2) determine whether to set a resume indicator based on the direct distance from the current position of the vehicle to the selected destination; and 3) determine whether to set a resume indicator based on both direct distance from the current position of the vehicle to the selected destination and the actual distance along the route from the current position of the vehicle to the selected destination.

7. ***A direct distance***

Dependent claim 26 reads:

An apparatus according to claim 25, wherein the means for determining comprises means for deciding whether to resume the guidance routine based on a direct distance from the current position of the vehicle to the selected destination.

The function is not disputed: deciding whether to resume the guidance routine based on a direct distance from the current position of the vehicle to the user selected destination. The parties' only dispute concerns the corresponding structure. Plaintiff's suggested structure is not correct because it includes enabling but unrelated steps. Defendant's suggested structure is accurate because it narrowly follows the revealed function and the teaching of the specification (col. 5, lns. 66-67; col. 6, lns. 1-2). I adopt defendant's construction almost verbatim:

CPU 10, bus 24, memory (ROM 11, RAM 12 and/or mass storage medium 13) with associated software instructions to perform the following step: determine whether to set a resume indicator based on the direct distance from the current position of the vehicle to the selected destination.

ORDER

IT IS ORDERED that the disputed claim language appearing in the eight patents-in-suit is construed as set forth in this opinion.

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