

United States District Court,
E.D. Texas, Tyler Division.

HONEYWELL INTERNATIONAL, INC,
v.
ACER AMERICA CORPORATION.

Civil Action No. 6:07-CV-125

Jan. 7, 2009.

A. James Anderson, Anna R. Carr, J. Scott Culpepper, Jean-Alain Schneider, Marla R. Butler, Stephen R. Risley, Robins, Kaplan, Miller & Ciresi, Atlanta, GA, J. Thad Heartfield, The Heartfield Law Firm, Beaumont, TX, for Honeywell International, Inc., et al.

An Phuoc Doan, Jerry Chen, Michael Ting, Steven S. Baik, Menlo Park, CA, Michael Charles Smith, Siebman, Reynolds, Burg, Phillips & Smith, LLP, Marshall, TX, Marvin Craig Tyler, Luiz Von Paumgarten, Wilson, Sonsini, Goodrich & Rosati, PC, Austin, TX, Seuntaik Michael Song, Wilson, Sonsini, Goodrich & Rosati, Theodore Herhold, Townsend & Townsend & Crew, Palo Alto, CA, for Acer America Corporation, et al.

MEMORANDUM OPINION AND ORDER

JOHN D. LOVE, United States Magistrate Judge.

This claim construction opinion construes the disputed terms in U.S. Patent No. 5,041,823 (the "'823 patent"). In the above-styled cause of action, Plaintiffs Honeywell, Inc. and Honeywell International, Inc. ("Honeywell") accuse Defendants Acer America Corp., AU Optronics Corp., AU Optronics Corp. America, BenQ America Corp., BenQ USA Corp., Chunghwa Picture Tubes, Ltd., and Novatek Microelectronics Corp. of infringing claims 1, 2, 4, and 5 of the '823 patent. The parties have submitted a number of claim terms for construction. Honeywell has filed an Opening Claim Construction Brief (Doc. No. 116) and a Reply Claim Construction Brief (Doc. No. 122). Defendants have jointly filed a Responsive Claim Construction Brief (Doc. No. 118), and a Motion for Summary Judgment asserting invalidity of the '823 patent because of indefiniteness. (Doc. No. 119.) A *Markman* hearing was held on November 20, 2008. For the reasons stated herein, the Court adopts the constructions set forth below.

OVERVIEW OF THE PATENT

Now, LCD screens are commonly used for computer monitors and televisions, but in the 1980s, the technology was still in its infancy. Early research into the technology revealed that the screens were susceptible to an electroplating corrosion effect unless the polarity of the electrical signal sent to the screen was reversed. Unfortunately, polarity switching causes a noticeable flicker of the image on the screen. The

'823 patent, issued on August 20, 1991, describes a solution to this flicker problem.

An LCD screen typically consists of liquid crystal material between two sheets of glass arranged in front of a light source, or backlight. The display is composed of rows and columns of pixels, which are the smallest units of the image. The liquid crystal molecules at each pixel rotate and change position based on the amount of voltage applied to the molecules. The position of the molecules determines how much light passes through each pixel. Row by row, from top to bottom, each pixel receives the appropriate voltage level to achieve the desired brightness.

In order to avoid electroplating, the polarity of this voltage must be periodically inverted. The entire screen can be inverted from positive to negative voltage, and vice versa, but this creates a noticeable flicker effect. To avoid this flicker effect while still preventing electroplating, small regions of the screen can be inverted. Because the human eye cannot detect polarity changes in small regions of the screen, the image appears stable and flicker-free. The '823 patent describes a system which inverts the polarity of rows or columns of pixels on a frame by frame basis. Claim 1 reads:

1. A flicker-free liquid crystal display (LCD) system comprising:

a first plurality of lines of LCD pixels;

a second plurality of lines of LCD pixels, wherein said first and second pluralities of lines are interlaced in an alternating fashion to compose a display, such that each line of said first plurality of lines, is adjacent to at least one line of said second plurality of lines;

a first set of drivers connected to said first plurality of lines;

a second set of drivers connected to said second plurality of lines;

switching means, connected to said first and second sets of drivers, for providing a first voltage to said first set of drivers and a second voltage to said second set of drivers, wherein the first and second voltages have opposite polarities, with respect to each other, and the polarities are interchanged by said switching means at each frame change of display data;

interface means, connected to said first and second sets of drivers, for controlling said first and second sets of drivers;

a latching device connected to said interface means;

a shift register connected to said latching device; and wherein:

the display data and timing signals enter said shift register;

said shift register passes on a portion of display data to said latching device for retention for a certain period of time; and

said interface means receives display data from said shift register via said latching device and provides signals to said first and second sets of drivers.

Honeywell has asserted independent claim 1, and dependent claims 3, 4, and 5 of the '823 patent against Defendants. Defendants have asserted that claim 1 is invalid as indefinite for failing to particularly point out and distinctly claim an invention under 35 U.S.C. s. 112, para. 2. The parties have submitted claim terms for construction.

APPLICABLE LAW

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed.Cir.2005) (quoting Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed.Cir.2004)). In claim construction, courts examine the patent's intrinsic evidence to define the patented invention's scope. See *id.*; C.R. Bard, Inc. v. U.S. Surgical Corp., 388 F.3d 858, 861 (Fed.Cir.2004); Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1267 (Fed.Cir.2001). This intrinsic evidence includes the claims themselves, the specification, and the prosecution history. See Phillips, 415 F.3d at 1314; C.R. Bard, Inc., 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. Phillips, 415 F.3d at 1312-13; Alloc, Inc. v. Int'l Trade Comm'n, 342 F.3d 1361, 1368 (Fed.Cir.2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. Phillips, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can also aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314-15.

Claims "must be read in view of the specification, of which they are a part." *Id.* (quoting Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed.Cir.1995)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996)); Teleflex, Inc. v. Ficoso N. Am. Corp., 299 F.3d 1313, 1325 (Fed.Cir.2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. Phillips, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* Also, the specification may resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." Teleflex, Inc., 299 F.3d at 1325. But, " '[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1187 (Fed.Cir.1998) (quoting Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 1571 (Fed.Cir.1988)); see also Phillips, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. Home Diagnostics, Inc., v. Lifescan, Inc., 381 F.3d 1352, 1356 (Fed.Cir.2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). The doctrine of prosecution disclaimer is well established and prevents a patentee from recapturing through claim interpretation specific meanings disclaimed during the prosecution of the patent. See Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1223 (Fed.Cir.2003). The prosecution history

must show that the patentee "clearly and unambiguously" disclaimed or disavowed the proposed interpretation during the patent's prosecution to obtain claim allowance. *Middleton, Inc. v. 3M Co.*, 311 F.3d 1384, 1388 (Fed.Cir.2002). "Indeed, by distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover." *Spectrum Int'l v. Sterilite Corp.*, 164 F.3d 1372, 1378-79 (Fed.Cir.1998). "As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on definitive statements made during prosecution." *Omega Eng'g, Inc.*, 334 F.3d at 1324.

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition is entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

The patents in suit may contain means-plus-function limitations that require construction. Where a claim limitation is expressed in "means plus function" language and does not recite definite structure in support of its function, the limitation is subject to 35 U.S.C. s. 112, para. 6. *Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed.Cir.1997). In relevant part, 35 U.S.C. s. 112, para. 6 mandates that "such a claim limitation 'be construed to cover the corresponding structure ... described in the specification and equivalents thereof.'" *Id.* (citing 35 U.S.C. s. 112, para. 6). Accordingly, when faced with means-plus-function limitations, courts "must turn to the written description of the patent to find the structure that corresponds to the means recited in the [limitations]." *Id.*

Construing a means-plus-function limitation involves multiple inquiries. "The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed.Cir.2001). Once a court has determined the limitation's function, "the next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id.* A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Id.* Moreover, the focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id.*

Also at issue is whether certain claims are indefinite. A claim is invalid under 35 U.S.C. s. 112, para. 2 if it fails to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. The party seeking to invalidate a claim under 35 U.S.C. s. 112, para. 2 as indefinite must show by clear and convincing evidence that one skilled in the art would not understand the scope of the claim when read in light of the specification. *Intellectual Prop. Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc.*, 336 F.3d 1308, 1319 (Fed.Cir.2003). The test for indefiniteness is stringent—a claim is invalid as indefinite if it is not "amenable to construction." *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed.Cir.2001). The definiteness requirement of 35 U.S.C. s. 112, para. 2 "focuses on whether the claims, as interpreted in view of the written description, adequately perform their function of notifying the public of the [scope of the] patentee's right to exclude." *S3 Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 1371-

72 (Fed.Cir.2001) (citing *Solomon*, 216 F.3d at 1379). It requires "that the claims be amenable to construction, however difficult that task may be." *Exxon Research*, 265 F.3d at 1375. Because a claim is presumed valid, a claim is indefinite only if the "claim is insolubly ambiguous, and no narrowing construction can properly be adopted." *Id.*; see also *Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 1338-39 (Fed.Cir.2003).

DISCUSSION

The parties present the following claim terms for construction: (1) "shift register," (2) "timing signals," (3) the "interface means" clause, (4) the "switching means" clause, and (5) other terms in which the parties have reached an agreed construction.

I. "shift register"

a *shift register* connected to said latching device; and wherein:
the display data and timing signals enter said *shift register*;

said *shift register* passes on a portion of display data to said latching device for retention for a certain period of time;

and said interface means receives display data from said *shift register* via said latching device and provides signals to said first and second sets of drivers.

Defendants propose that this term should be construed as "[a] register in which, at each common shift clock cycle the pattern of 0's and 1's in the register shifts to the right or left, with the data at the input of the register entering from the left or right, respectively." Honeywell agrees that Defendants' proposed construction is a well known description of a "shift register," but Honeywell contends that the term "shift register," as used in the '823 patent, also has a broader meaning, *i.e.* "a circuit FN1 that includes an array of linearly connected cells which receive binary digits that, in response to clocking, shift in a common direction." Honeywell's proposed construction essentially states that a shift register is any circuit that contains a "shift register" as construed by Defendants.

FN1. A register is a single component; a circuit is an interconnection of components. Def.'s Br. at 8-9.

The block diagram of Figure 6 is an embodiment of an LCD column driver for applying digital display data to an LCD and is covered by claim 1. The parties agree that block 34 in Figure 6 is a shift register in accordance with Defendants' proposed construction.

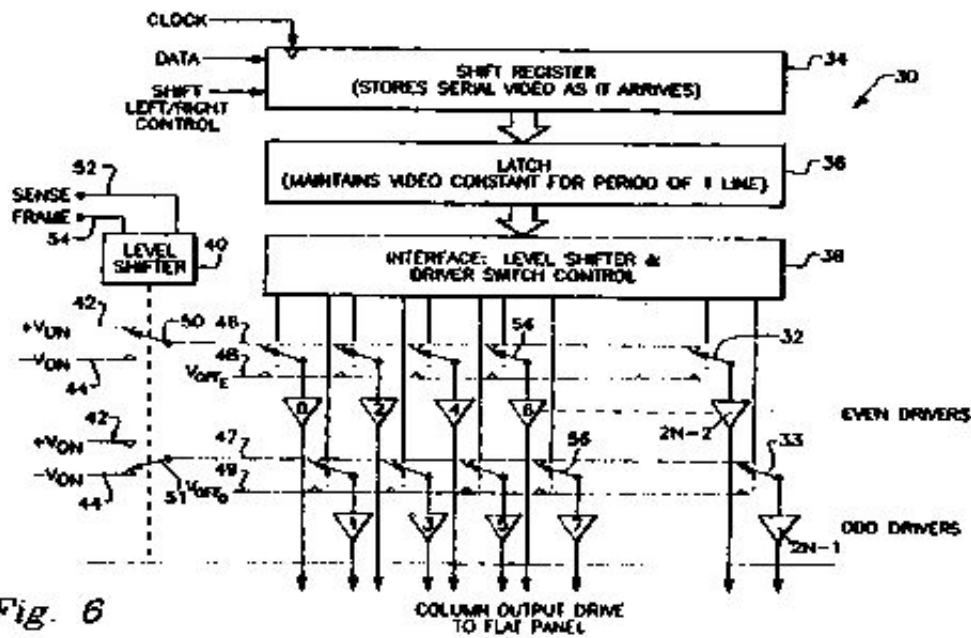


Fig. 6

The '823 patent also discloses an embodiment of a column driver for applying analog display data to an LCD. This embodiment is shown in Figure 10. The analog column driver shows analog intensity data being applied to an inverting amplifier 62, which in turn provides the analog data to first and second ping-pong sample-and-hold capacitor banks 68 and 70.

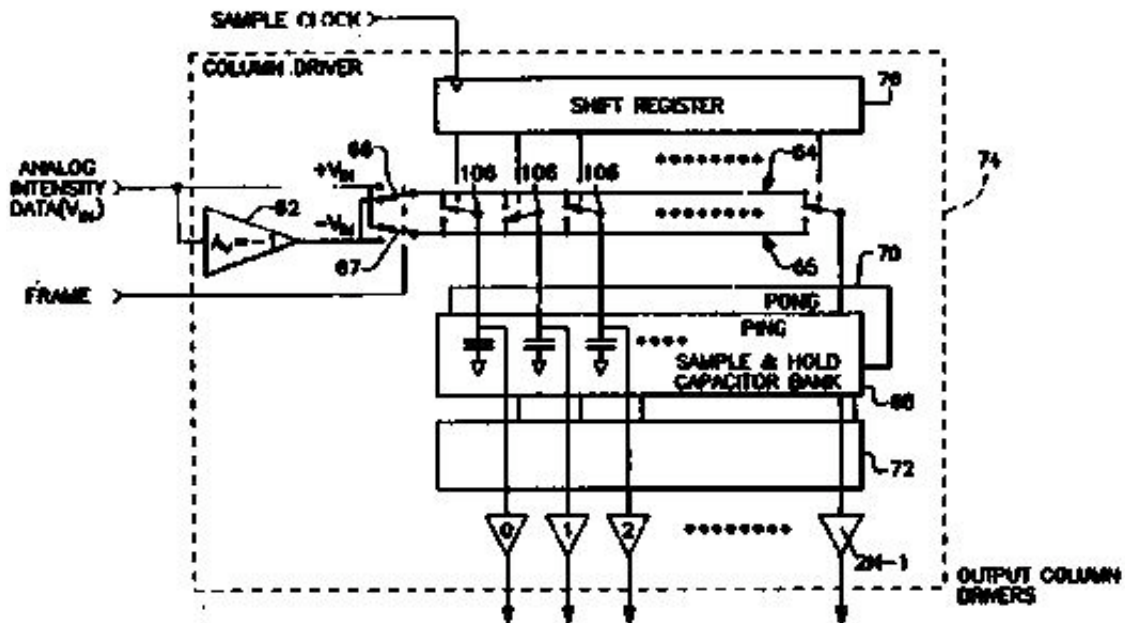


Fig. 10

Honeywell relies upon claim 7 and the embodiment of Figure 10 to support its proposed construction of "shift register." Honeywell argues that, because timing signals are shown entering shift register block 76 and display data is shown entering capacitor banks 68 and 70, in order to read claim 7 onto the embodiment of Figure 10, the shift register recited in claim 7 must be read in a broader sense to include the capacitor banks 68 and 70 and not restricted to just shift register block 76. Honeywell argues that its construction of "shift register" is required in order for claim 7 to be read consistent with the embodiment of Figure 10, which claim 7 is intended to cover.

Defendants counter that claim 7 separately recites the shift register from the first and second capacitor banks. Moreover, claim 7 specifies that the shift register is "connected to" the capacitor banks. In view of that claim language, Defendants argue that Honeywell is advancing a clearly erroneous interpretation of claim 7 that combines the shift register and capacitor banks. Defendants are correct. Honeywell's analysis of claim 7 in relation to Figure 10 is flawed and, therefore, does not support its proposed construction of the term "shift register."

Honeywell offers no further intrinsic evidence to support its construction. Defendants, on the other hand, point out that their construction is consistent with every other use of the term "shift register" in the '823 patent. For example, the specification twice refers to "shift register 76," which strongly implies that box 76 in Figure 10, standing alone, embodies a shift register. *See* '823 Patent at 7:18-7:19; 7:38-7:41. In addition, the specification refers to box 76 as a "timing mechanism," and states that its purpose is to "provide[] timing for sampling the input analog voltage." *See* '823 Patent at 7:18-7:19; 7:38-7:44. These statements contradict Honeywell's contention that both timing data *and* display data enter the "shift register" in Figure 10. Defendants also point out that their construction is consistent with several pieces of extrinsic evidence, including technical treatises and data sheets for off the shelf shift registers sold at the time of the patented invention. *See, e.g.*, THE ART OF ELECTRONICS 525 (2d ed.1989); ELECTRICAL ENGINEERING FUNDAMENTALS 571 (2d ed.1986).FN2

FN2. Honeywell argues that THE ART OF ELECTRONICS contains statements consistent with Honeywell's construction, but this argument mischaracterizes statements made in that book. Honeywell claims that it refers to a RAM circuit as a shift register. THE ART OF ELECTRONICS 527. More accurately, the book states that a RAM circuit can be *used as* a shift register, not that a RAM circuit *is* a shift register.

The Court therefore rejects Honeywell's proposed construction of "shift register," which would include a circuit structure that, in response to timing signals, shifts a "1" bit from cell to cell in one array of cells ("walking 1") while entering display data into a separate array of cells. Honeywell's proposed construction would broaden the term "shift register" to merely require a circuit structure operative to perform serial-to-parallel conversion of binary data. While a shift register can be used to perform serial-to-parallel conversion of binary data, the term "shift register" denotes a more particular type of electronic component in accordance with Defendants' proposed construction.

Accordingly, the Court adopts Defendants' construction.

II. "timing signals"

a shift register connected to said latching device; and wherein:
the display data and *timing signals* enter said shift register;

Honeywell propose that no construction of this term is necessary, but if one is given, it should be "signals controlling the timed transfer of data." Defendants propose that this term should be construed as "signals that instruct the shift register to accept new data while shifting existing data to the left or to the right." Honeywell argues that Defendants' proposed construction improperly excludes Honeywell's construction of the term "shift register." Because the Court has rejected Honeywell's construction of the term "shift register," Honeywell's argument is unpersuasive. The Court adopts Defendants' construction of the term "timing signals" because it is consistent with the Court's construction of the term "shift register."

III. "interface means ..."

interface means, connected to said first and second sets of drivers, for controlling said first and second sets of drivers;

The parties agree that the "interface means" clause must be construed according to 35 U.S.C. s. 112 para. 6 as a means plus function claim. "The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed.Cir.2001). Once a court has determined the limitation's function, "the next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id.*

A structure disclosed in the specification is "corresponding" structure only if the specification clearly links that structure to the function. *Id.* If there is no corresponding structure, then the claim is invalid as indefinite. *See Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1378 (Fed.Cir.1999). This requirement is "not a high bar," a patentee need only show that one skilled in the art would understand what structure corresponds with the function. *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 950 (Fed.Cir.2007); *see also In re Dossel*, 115 F.3d 942, 946 (Fed.Cir.1997).

In *In re Dossel*, the function of the clause at issue was " 'reconstructing' data." 115 F.3d at 946. The specification explained that this function was accomplished by a device which receives digital data from memory and user input, performs mathematical computations and outputs the results to a display by known algorithms. *Id.* Despite this abstruse explanation, the Federal Circuit stated that the patentee was not required to use the "magic word 'computer.' " It concluded that one skilled in the art would be able to identify the corresponding structure as a personal computer. *Id.* In *Biomedino, LLC v. Water Technologies Corp.*, the function of the clause at issue was automatically operating valves. 490 F.3d at 950. The specification explained that this function was performed by a "Control" using "known differential pressure equipment," "known valving equipment," or "known control equipment." *Id.* The Federal Circuit determined that this explanation failed to disclose any corresponding structure, rather it simply restated the function to be performed. *Id.* at 953.

In this case, the parties further agree that the relevant function is "controlling said first and second drivers." However, the parties disagree as to whether there is corresponding structure disclosed in the specification. Honeywell points to block 38 of Figure 6 as the corresponding structure, and Defendants assert that there is no corresponding structure in the specification.FN3

FN3. Honeywell also argues that box 38 of Figure 11 is corresponding structure, but this argument must be

rejected. Figure 11 only contains one driver so block 38 could not be structure for "controlling said first and second drivers."

The block diagram of Figure 6 and the written description of it, disclose structure for "controlling said first and second drivers." The written portion of the specification explains how the embodiment shown in Figure 6 works. ' 823 Patent at 5:67-6:66. Digital display data enters a shift register and is then passed on to a latch. At this point the digital data must be converted to analog signals before an image can be displayed on the screen. Drabik Decl. at para. 43-44; Stewart Decl. para. 57-58. This conversion is achieved by "pulse-width modulation," *i.e.* "time-modulating the length of time that [the column driver switches] are 'on.'" ' 823 Patent at 6:39-6:59. The column driver switches transmit voltages to the "first and second drivers." When they are 'on,' the "first and second drivers" receive a fixed voltage—the longer the switches are on, the more voltage accumulates in the LCD pixel elements. '823 Patent at 6:39-6:59. Each pixel's brightness is determined by the amount of voltage it accumulates. Drabik Decl. at para. 10. Thus, the specification explains that some component must adjust the length of time that the driver switches are 'on,' in response to the digital display data. This component is the one that controls the "first and second drivers." Figure 6 labels this component as "INTERFACE: LEVEL SHIFTER & DRIVER SWITCH CONTROL." Although this label is somewhat vague, the written portion of the specification clearly states that the required component must perform "pulse width modulation." '823 Patent at 6:39-6:59. The parties' experts acknowledge that a level shifter, a well known component at the time, can translate digital data into driving voltages. *See* Stewart Decl. at para. 52; Drabik Decl. at para. 42. They also agree that a pulse width modulator, another a well known component at the time, can perform pulse width modulation. *See* Stewart Decl. at para. 59; Drabik Decl. at para. 44.

Defendants contend that, under *Biomedino*, block 38 of Figure 6 and the references to "pulse width modulation," do not qualify as corresponding structure. *See* 490 F.3d at 953. They claim that the appropriate corresponding structure would be a pulse width modulator, but because the term "pulse width modulator" never appears in the patent, no corresponding structure is disclosed. Defendants' interpretation of *Biomedino* is overly broad. *Biomedino* did not alter well settled law that a patentee need only show that one skilled in the art would understand what structure corresponds with the function. *See* 490 F.3d at 950; *see also* *In re Dossel*, 115 F.3d at 946-47.

As in *In re Dossel*, one skilled in the art would understand what structure corresponds with the function of this term, even though the patent does not use the "magic word" "pulse width modulator." *See* 115 F.3d at 946-47. The ' 823 patent discloses that the first and second drivers are controlled by some component which performs pulse width modulation. It labels this component as "INTERFACE: LEVEL SHIFTER & DRIVER SWITCH CONTROL." Although the inventors could have more accurately labeled this component as a "pulse width modulator," their failure to do so does not mean that no structure is disclosed.

Thus, the corresponding structure associated with this term is the level shifter and driver switch control in block 38 of Figure 6 wherein the driver switch control element is a digital-to-analog converter implemented as a pulse width modulator, and equivalents thereof. *See* Drabik Decl. at para. 45.

IV. "switching means ..."

switching means, connected to said first and second sets of drivers, for providing a first voltage to said first set of drivers and a second voltage to said second set of drivers, wherein the first and second voltages have

opposite polarities, with respect to each other, and the polarities are interchanged by said switching means at each frame change of display data;

The parties agree that the "switching means" clause should be governed by 35 U.S.C. s. 112 para. 6. They also agree that the "switching means" clause recites two separate functions, but disagree as to what those functions are, and what the corresponding structure is. The disputes center around whether the voltages provided to the drivers must be fixed and of opposite polarity, and whether the polarities must be interchanged only at each frame change.

A. Providing Voltages Function

Honeywell argues that the first function of the "switching means" clause should be construed as "providing a first voltage to the first set of drivers and a second voltage to the second set of drivers wherein voltage to the first set of drivers has a polarity opposite that provided to the second set of drivers relative to a reference voltage." Defendants argue that the function should be construed as "[p]roviding a first voltage to the first set of drivers and a second voltage to the second set of drivers.... The first and second voltages have opposite polarities with respect to each other." Furthermore, the first voltage is "a single fixed voltage opposite in polarity to the second voltage," and the second voltage is "a single fixed voltage opposite in polarity to the first voltage."

Honeywell's proposed construction states that the voltages "have opposite polarity ... relative to a reference voltage," even though the concept of a "reference voltage" is absent from the language of claim 1. To support this construction, it points to language in the specification. As explained in the context of Figure 6: "Supply rails 48 and 49 in Figure 6 provide the voltage needed to deactivate the liquid crystal material and provide a reference DC level about which the polarities alternate." '823 Patent at 6:32-35. Honeywell contends that one of ordinary skill in the art would have known that the voltages could have been alternated around any reference voltage such as 0 or +5. For example, if the reference voltage is +5 then voltages +1 and +9 have opposite polarities relative to the reference voltage because the difference between +5 and +1 is -4 and the difference between +5 and +9 is +4.

Although Honeywell is correct to point out that the specification discloses this use of a reference voltage, the plain language of claim 1 fails to claim it. The claim language clearly states that the "voltages have opposite polarities, with respect to each other." In the example above, the voltages do not have opposite polarities with respect to each other because +1 and +9 are both positive. Because Honeywell's construction directly contradicts the claim language, it must be rejected.

Honeywell argues that Defendants' construction is overly narrow because it limits the claim to fixed voltages and improperly excludes variable voltages. Although the phrase at issue does not explicitly limit claim 1 to fixed voltages, the claim language as a whole does. As explained above, the signals sent to the drivers mentioned in claim 1 must be converted from digital to analog. The '823 patent discloses that this conversion takes place by means of pulse width modulation. Pulse width modulation requires "binary levels of voltage," *i.e.* fixed voltages. '823 Patent at 6:39-6:40. Thus, the voltage provided to the drivers must be fixed. Therefore, this function of the term is properly construed as "Providing a first voltage to the first set of drivers and a second voltage to the second set of drivers.... The first and second voltages have opposite polarities with respect to each other." The first voltage is "a single fixed voltage opposite in polarity to the second voltage," and the second voltage is "a single fixed voltage opposite in polarity to the first voltage."

B. Frame Change Function

Honeywell argues that the second function corresponding to the switching means is interchanging the polarities of the voltages sent to the drivers at least at each frame change of display data, and possibly more frequently. Defendants argue that the function is interchanging the polarities only at the conclusion of a frame of display data.

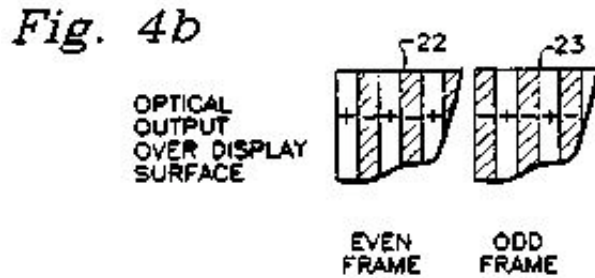
Honeywell's first argument to support its construction is that because the plain language of claim 1 does not state that polarities are interchanged only at each frame change, the claim may not be limited in such a way. Honeywell notes that, "if a patent requires A, and the accused device or process uses A *and* B, infringement will be avoided only if the patent's definition of A excludes the possibility of B." *See N. Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1296-97 (Fed.Cir.2000). Defendants properly point out that this rule deals with how the infringement comparison test is conducted for open-ended claims using the term "comprising." It has nothing to do with construing the function of a means plus function element. The Court finds Honeywell's argument to be unpersuasive. The purpose of claim construction is not to determine the broadest possible scope of the claim, but rather to give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312-13; *Alloc, Inc.*, 342 F.3d at 1368.

Next, Honeywell argues that the term "frame" is simply a label for the signal that controls the alternation of polarity. Defendants counter that the phrase "at each frame change of display data" refers to a new frame of video data, *i.e.* a single screen image. In a related argument, Honeywell contends that, because the specification discloses an embodiment wherein interchanging polarities occurs more frequently than at the end of a frame of data, Defendants' construction improperly excludes this embodiment. Specifically, Honeywell points to the embodiment of Figure 11, wherein polarities are interchanged at every row change of display data. Defendants argue that even if the specification mentions an embodiment which interchanges polarities more frequently than at the end of a frame of data, that embodiment is an unclaimed embodiment not covered by claim 1. Resolving these disputes requires an understanding of how an LCD system operates.

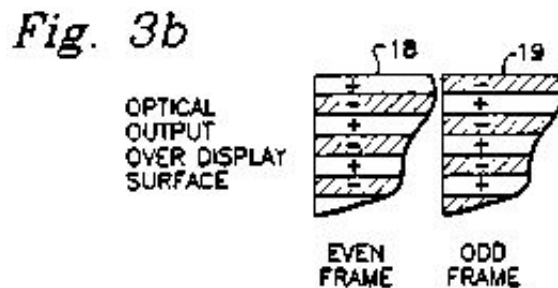
In an LCD system, the screen is a matrix of pixels arranged in rows and columns. *Drabik Decl.* at para. 9-10. Each intersection of the rows and columns is a pixel. Display data is transmitted to each row of pixels from top to bottom. *Drabik Decl.* at para. 11-12. That is, when a row line is activated, pixels in that row are connected to their respective column lines and take on the voltages present on their column lines. Once data has been sent to a row of pixels, a "horizontal sync" signal instructs the next lower row of pixels to be activated. *See Drabik Decl.* at para. 12; *see also Togashi*, U.S. Pat. No. 4,635,127 at 3:20-3:65; *cf.* '823 Patent at 7:63-7:68. Once data has been sent to every row of pixels on the screen, *i.e.* an entire screen image has been displayed, a "vertical sync" signal instructs the top row of pixels to again be activated, and the process starts over again at the top row of the screen. '823 Patent at 5:19-5:36; *see Drabik Decl.* at para. 12; *see also Togashi*, U.S. Pat. No. 4,635,127 at 3:20-3:65.

The parties agree that at least one embodiment of Claim 1 is an LCD system with two sets of column drivers as shown in Figure 6, wherein each set (odd or even number column) is provided with voltages of opposite polarity with respect to each other. *Pl.'s Br.* at 15; *Def.'s Br.* at 22; *see* '823 Patent at 5:11-5:36. That is, one set of column drivers is provided with a positive voltage, and the other set is provided with a negative voltage. '823 Patent at 5:67-6:5. Thus, the first pixel in a row (odd) receives a display data signal from a positive voltage column driver so it accumulates a positive charge, the second, adjacent pixel in the row (even) receives a display data signal from a negative voltage column driver so it accumulates a negative charge, the third pixel in the row (odd) accumulates a positive charge and so forth to the end of the row. At horizontal sync, the next lower row of pixels is activated in a similar fashion. Because this process is

repeated for every row, the screen will be filled with columns of pixels alternating between positive and negative. '823 Patent at 5:19-22. Once the last row at the bottom of the screen has been activated and the data has been displayed, *i.e.* at vertical sync, the polarities of the sets of drivers are interchanged, and the top row of the screen is activated for data display. Because the polarities are now interchanged, the first pixel in a row will receive a negative signal, the second pixel will receive a positive signal, and so forth. The entire screen will be filled with columns of pixels now having signals with the opposite polarity applied to them. '823 Patent at 5:24-5:26. This sort of local polarity inversion is commonly referred to as "column inversion," Stewart Decl. para. 9, 10, as shown in the Figure below:



The '823 patent discloses an alternate embodiment to Figure 6, which is shown in Figure 11. Instead of employing two sets of column drivers, which are provided with opposite polarity voltages, as seen in the embodiment of Figure 6, the embodiment of Figure 11 employs only one set of column drivers. Because there is only one set of column drivers, every pixel in a row accumulates voltage having the same polarity. At horizontal sync, the polarity of the drivers is interchanged, and the next lower row of pixels is activated. Every pixel in this lower row accumulates voltage opposite in polarity to the row above it. The entire screen will be filled with rows of pixels now having signals with the opposite polarity applied to them. This sort of local polarity inversion is commonly referred to as "row inversion," Stewart Decl. para. 9, 10, as shown in the Figure below:



The embodiments of Figures 6 and 11 illustrate what is referred to more generally as "line inversion." Stewart Decl. para. 10. A third type of local polarity inversion is "dot inversion," wherein each frame has a checkerboard pattern of pixels of opposite polarity. Stewart Decl. para. 10.

With this background in mind, the Court turns to Honeywell's argument that the term "frame" is simply a

label for the signal that controls the alternation of polarity. Honeywell argues that polarity switching in Figure 11 is synchronized with a "frame" signal that causes polarity interchange of the column drivers at the change of each row of display data. According to Honeywell, this means that the term "frame" is interchangeably used to refer generally to polarity interchange of the column drivers whether it is occurring exactly once per frame of display data or after every row of display data. However, the '823 patent specification makes clear that in order to interchange polarities of the column drivers after every row, the "frame signal *must be altered* ..., which is accomplished by ... a signal derived from horizontal sync instead of vertical sync." (emphasis added) '823 patent at 7:64-68.

Thus, contrary to Honeywell's assertion, the '823 patent clearly ties column polarity interchange in Figure 6 to vertical sync but ties row polarity interchange in Figure 11 to horizontal sync. '823 patent at 6:15-17; 7:64-68. In other words, polarity interchange is tied to a frame signal in Figure 6, and a row signal in Figure 11. Thus, Honeywell's argument that the term "frame" refers to a signal for polarity interchange lacks merit.

The Court now turns to Honeywell's argument that Defendants' construction of "at each frame change of display data" excludes the embodiment of Figure 11. "A claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever correct." *Globetrotter Software*, 362 F.3d at 1381. On the other hand, reliance on an embodiment not covered by the plain language of the claim to broaden the construction of a term is improper. *See Telemac Cellular Corp. v. Topp Telecom, Inc.* 247 F.3d 1316, 1325 (Fed.Cir.2001).

Honeywell is correct that the embodiment of Figure 11 and its description refers to interchanging column driver polarities more frequently than at each frame change of display data in order to achieve row inversion. '823 Patent at 7:63-7:68. However, claim 1 does not read on Figure 11 because Figure 11 does not contain the switching means limitation of claim 1. As explained above, the Figure 11 embodiment achieves row inversion by only employing one set of drivers which interchanges polarity at each row change of display data. It does not contain a "switching means" connected to "a first and second sets of drivers." '823 patent at 8:50-8:51. Thus, the embodiment of Figure 11, even under Honeywell's proposed construction, is nevertheless excluded from claim 1. The embodiment of Figure 11 is an unclaimed embodiment of the '823 patent.

If the specification stated that the embodiment illustrated in Figure 6, which claim 1 does read on, were somehow capable of row inversion, then Honeywell's argument may have had some merit. Because the specification identifies the embodiment of Figure 11 as a row inversion alternative to the column inversion of the embodiment of Figure 6 and only discusses row inversion as being applicable to Figure 11, Honeywell's argument is unpersuasive. '823 patent at 5:41-44; 7:63-64. Conceivably, the embodiment of Figure 6 could include additional switching to toggle the polarity of the column drivers during a single frame scan as a function of even/odd rows, which would produce dot inversion. The polarities of the dots would also be interchanged at each frame change of display data by the column switching shown. However, nowhere in the written description of the '823 patent is there any indication of such an embodiment, and claim 1 refers to lines of pixels of alternating polarity, rather than dots. Thus, the Court finds that Defendants' construction properly construes the function of the "switching means ..." term as interchanging polarities only at the conclusion of a frame of display data.

The Court also finds that Honeywell's construction is barred by the doctrine of prosecution disclaimer. *Omega Eng'g, Inc.*, 334 F.3d at 1324. "[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the

claim congruent with the scope of the surrender." *Id.* In this case, the PTO rejected as anticipated and/or obvious, in light of Katagishi, all of the original claims in the '823 application. T. Katagishi, et al., *A New Driving Technique for Flicker-Free Full Resolution LC-TV*, SID 86 Digest, Article 16.3, pp. 285-288 ("Katagishi"). As a result, the patentee cancelled its original 17 claims and added claims 18-24 (now claims 1-7).

Katagishi describes an LCD system in which pixel polarity is interchanged at the end of each frame, *and* within each frame, when there is a change from the odd field of the frame to the even field of the frame. Even and odd rows are scanned within periods called fields, which together comprise a frame, with the frame portraying the whole picture. '823 patent at 8:19-23. As shown in Figure 9(b) of Katagishi, the pixels in the matrix are variously in a dot inversion arrangement (odd field) or a column inversion arrangement (even field). In order to distinguish Katagishi, the patentee explained that claim 1 covers "a display system having, in an unobvious combination, the particular features for interlaced sets of lines of pixels with opposing and interchanging polarities on a frame-to-frame basis." '823 Patent Amendment Mar. 14, 1991 at p. 6. With these remarks the patentee distinguished Katagishi's disclosure for polarity interchange within a frame. Thus, the patentee clearly disclaimed interchanging polarities more frequently than at the end of each frame of display data. The patentee also clearly disclaimed schemes for local polarity inversion other than line inversion by referring to "lines of pixels with opposing and interchanging polarities." Thus, the Court adopts Defendants' construction.

C. Corresponding Structure

The parties agree that switches 50, 51, and 56 of Figure 6 correspond with the functions of this claim term. Defendants assert that the corresponding structure must also include source voltages 42 and 44, frame module 40, frame signal 54, and supply rails 46 and 47. Honeywell also argues that switches 66, 67, 72, and 106 of Figure 10 and switches 32 and 82 of Figure 11 are alternative corresponding structures. Defendants argue that these alternative structures cannot correspond with the recited functions because claim 1 does not read on Figures 10 and 11.

When identifying structure corresponding to the function of a means plus function claim limitation, the structure must be clearly linked to the recited function. *See Medtronic, Inc.*, 248 F.3d at 1311. Furthermore, the structure must actually perform the recited function, not merely enable it. *See Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed.Cir.2003) ("[f]eatures that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations"); *Asyst Techs, Inc. v. Empak, Inc.*, 268 F.3d 1362, 1371 (Fed.Cir.2001).

As explained above, claim 1 does not read on Figure 11 because Figure 11 only contains one set of column drivers. Thus Figure 11 does not contain a "switching means" connected to two different sets of drivers. Similarly, Claim 1 does not read on Figure 10. The "switching means" in Figure 10 is for, *inter alia*, receiving "variable first and second voltages ... that represent intensity data for the pixels." '823 Patent at 10:16-26. This is a different function from the one described in claim 1. *See Stewart Decl.* at para. 36. Thus, contrary to Honeywell's arguments, the structures in these Figures cannot be clearly linked to functions of a term in claim 1. *See Medtronic, Inc.*, 248 F.3d at 1311.

Source voltages 42 and 44 and supply rails 46 and 47 cannot be considered corresponding structure because these elements *are the voltages* that are being provided and interchanged in this claim element. '823 Patent at 6:6-13; Drabik Decl. at para. 32. The voltages that are themselves being provided and interchanged are

not the structure that provides the voltages to the drivers, or that interchanges those same voltages. *See Northrop Grumman*, 352 F.3d at 1352-1353 (holding that "[t]he signals that are monitored by the circuitry that constitutes the 'means for monitoring' cannot be part of the structure that does the monitoring" and "control signals ... which are generated by the 'means for monitoring' cannot be part of the structure that performs the recited function of 'generating ... control signals.' ").

As to frame module 40 and frame signal 54, these structures serve simply to enable switches 50 and 51. '823 Patent at 6:13-14 ("Switches 50 and 51 are controlled by the frame module 40 which is driven by frame signal 54."). While frame module 40 and frame signal 54 enable switches 50 and 51 to perform the recited functions of this claim element, they "do[] not actually perform any of those functions." *See Asyst Techs, Inc.*, 268 F.3d at 1371. Therefore, they are not part of the corresponding structure of this claim element.

Switches 56, the driver switches, provide voltages to the column drivers. '823 Patent at 6:39-6:47. Switches 50 and 51 interchange the polarities of these voltages by alternating between the negative and positive voltages 42 and 44. '823 Patent at 6:6-6:22. Thus switches 50, 51 and 56 of Figure 6, and equivalents thereof, correspond with the recited functions.

D. Agreed Terms

The parties have agreed to the following constructions of the remaining terms: The term "display data" will be construed as "information defining the brightness of one or more pixels." The term "latching device" will be construed as "a register that stores data in response to a clock event, and retains it until a subsequent clock event."

CONCLUSION

For the foregoing reasons, the Court interprets the claim language in this case in the manner set forth above. For ease of reference, the Court's claim interpretations are set forth in a table attached to this opinion as Appendix A.

So ORDERED.

Appendix A

CLAIM TERM OR PHRASE (U.S. Patent No. 5,041,823)	PLAINTIFF'S PROPOSED CONSTRUCTION	DEFENDANTS' PROPOSED CONSTRUCTION	COURT'S CONSTRUCTION
1. A flicker-free liquid crystal display (LCD) system comprising:	No construction requested.	No construction requested.	No construction necessary
a first plurality of lines of LCD pixels;	[AGREED]	[AGREED]	"Columns or rows of LCD pixels"
a second plurality of lines of LCD pixels, ¹ wherein said first and second pluralities of lines are interlaced in	[AGREED]	[AGREED]	"Where the first and second pluralities of lines are arranged such that each line of the first plurality of lines is

<p>an alternating fashion to compose a display, such that each line of said first plurality of lines, is adjacent to at least one line of said second plurality of lines;</p>			<p>adjacent to at least one line of the second plurality of lines."</p>
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<p>a first set of drivers connected to said first plurality of lines;</p>	<p>[AGREED]</p>	<p>[AGREED]</p>	<p>"An electronic circuit that supplies an electrical signal to another electronic circuit."</p>
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<p>a second set of <i>drivers</i> connected to said second plurality of lines;</p>	<p>Construed <i>supra.</i></p>	<p>Construed <i>supra.</i></p>	<p>Construed <i>supra.</i></p>
--	--------------------------------	--------------------------------	--------------------------------

<p>switching means, connected to said first and second sets of <i>drivers</i>, for providing a <i>FIRST VOLTAGE</i>² to said first set of drivers and a <i>SECOND VOLTAGE</i> to said second set of drivers, wherein the first and second voltages have opposite polarities, with respect to each other, and the polarities are interchanged by said switching means at each frame change of display data;</p>	<p>" switching means ..." (entire phrase):</p>	<p>"switching means ..." (entire phrase):</p>	<p><i>Function:</i></p>
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This claim phrase should be governed by 35 U.S.C. s. 112(6).

This phrase should be construed according to 35 U.S.C. s. 112 para. 6.

"Providing a first voltage to the first set of drivers and a second voltage to the second set of drivers until the conclusion of a frame of display data where the polarities provided to the first and second

sets of drivers are interchanged at the conclusion of a frame of data. The first and second voltages have opposite polarities with respect to each other."

Function:

Providing a first voltage to said first set of drivers and a second voltage to said second set of drivers, wherein the first and second voltages have opposite polarities, with respect to each other, and the polarities are interchanged by said switching means at each frame change of display data.

This phrase should be construed as follows:
"Providing voltage to the first set of drivers and voltage to the second set of drivers wherein voltage to the first set of drivers has a polarity opposite that provided to the second set of drivers relative to a reference voltage. The interchanging of polarities occurs no less frequently than at each frame change of display data, and may occur more frequently than at each frame change of display data."

Structure:

Function:

Providing a first voltage to the first set of drivers and a second voltage to the second set of drivers until the conclusion of a frame of display data where the polarities provided to the first and second sets of drivers are interchanged at the conclusion of a frame of data. The first and second voltages have opposite polarities with respect to each other.

Structure:

Structure:

Switches 50, 51, and 56 of Fig. 6, and equivalents thereof.

Several alternative structures are disclosed:

Source voltages 42 and 44, one the opposite polarity of the other.

-> the switches 50, 51 and 56 of Fig. 6;

Switches 50 and 51 that select either source voltage 42 or source voltage 44. Switches 50 and 51 are controlled by the frame module 40. Frame module 40 is a level shifter that provides a level-shifted version of frame signal 54 to switches 50 and 51. Frame signal 54 is binary and oscillates with a period twice as long as that of the vertical sync. Thus, switches 50 and 51 are controlled to select the polarity opposite of that of the previous frame at the end after every vertical sync.

-> switches 66, 67, 72, and 106 of Fig. 10;

-> switches 32, and 82 of Fig. 11.

Supply rail 46 connected to switch 50 and supply rail 47 connected to switch 51.

Switches 56 that select between rails 46 and 48 or 47 and 49 providing a binary level of voltage to the first set of drivers or second set of drivers, respectively.

"... providing a FIRST VOLTAGE to said first

"FIRST VOLTAGE":

" FIRST VOLTAGE":

set of drivers and a SECOND VOLTAGE to said second set of drivers, wherein the first and second voltages have opposite polarities, with respect to each other ...":

"A single fixed voltage opposite in polarity to the first voltage."

"A single fixed voltage opposite in polarity to the second voltage."

"SECOND VOLTAGE":

"SECOND VOLTAGE":

"providing voltage to the first set of drivers and voltage to the second set of drivers wherein voltage to the first set of drivers has a polarity opposite that provided to the second set of drivers relative to a reference voltage."	"A single fixed voltage opposite in polarity to the second voltage."	"A single fixed voltage opposite in polarity to the first voltage."	
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interface means, connected to said first and second sets of drivers, for controlling said first and second sets of drivers;

"interface means ..."
(entire phrase):

"interface means ..."
(entire phrase):

Function:

"Controlling said first and second sets of drivers."

[AGREED AS TO FUNCTION ONLY]

[AGREED AS TO FUNCTION ONLY]

Structure:

This claim phrase should be governed by 35 U.S.C. s. 112(6).

This element should be construed according to 35 U.S.C. s. 112 para. 6.

The level shifter and driver switch control of block 38 in Fig. 6 wherein the driver switch control element

switch control element is a digital-to-analog converter implemented as a pulse width modulator, and equivalents thereof.

Function:

Controlling said first and second sets of drivers.

Structure:

There is no corresponding structure for this element.

Function:

Controlling said first and second sets of drivers.

Structure:

The level shifter and driver switch control in Block 38 in Figs. 6 and 11.

a latching device connected to said interface means;	[AGREED]	[AGREED]	"A register that stores data in response to a clock event, and retains it until a subsequent clock event."
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a **shift register** connected to said *latching device*; and wherein:

"**shift register**":

"**shift register**":

"A register in which, at each common shift clock cycle, the pattern of 0's and 1's in the register shifts to the right or left, with the data at the input of the register entering from the left or right, respectively."

	"a circuit that includes an array of linearly connected cells which receive binary digits that, in response to clocking, shift in a common direction"	"A register in which, at each common shift clock cycle, the pattern of 0's and 1's in the register shifts to the right or left, with the data at the input of the register entering from the left or right, respectively."	
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the **display data** and **timing signals** enter said *shift register*;

"**display data**":

"**display data**":

"Information defining the brightness of one or more pixels."

This claim term does not need construction by the Court. However, if the claim term is to be construed, the proper construction is:

"Information defining the shade of each pixel."

	"information defining the intensity (brightness) of one or more pixels"		
--	---	--	--

"timing signals":

"timing signals":

"Signals that instruct the shift register to accept new data while shifting existing data to the left or to the right."

This claim term does not need construction by the Court. However, if the claim term is to be construed, the proper construction is: "signals controlling the timed transfer of data"	"Signals that instruct the shift register to accept new data while shifting existing data to the left or to the right."		
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said <i>shift register</i> passes on a portion of <i>display data</i> to said <i>latching device</i> for retention for a certain period of time; and	Construed <i>supra.</i>	Construed <i>supra.</i>	Construed <i>supra.</i>
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<i>said interface means</i> receives display data from said <i>shift register</i> via said <i>latching device</i> and provides signals to said first and second sets of <i>drivers</i> .	Construed <i>supra.</i>	Construed <i>supra.</i>	Construed <i>supra.</i>
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3. Display of claim 1 wherein said first and second sets of <i>drivers</i> are within said display and any inputs to said <i>drivers</i> enter only a single edge of said display.	"within said display":	"within said display":	"Embedded in or on the glass of the display."
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[AGREED]

[AGREED]

4. Display of claim 1

No construction

No construction requested.

No construction

wherein:

requested.

necessary

said first plurality of lines is the odd-numbered lines counted from a first edge of the display; and

said second plurality of lines is the even-numbered lines counted from the first edge of the display.			
5. Display of claim 4 wherein the lines are columns.	No construction requested.	No construction requested.	No construction necessary

1. Where a claim term or phrase is used more than once within the claims at issue, it is so indicated by bolded and italicized font.

2. It is Defendants' position that both the entire "switching means" clause, as well as the internal terms "first voltage" and "second voltage" need to be separately construed. As such, those internal terms appear in bold, underlined, and in capital letters. Plaintiffs, however, wish to construe the terms "first voltage" and "second voltage" in the context of the larger phrase, "... providing a first voltage to said first set of drivers and a second voltage to said second set of drivers, wherein the first and second voltages have opposite polarities, with respect to each other ..." and thus this phrase is underlined.

E.D.Tex.,2009.

Honeywell Intern., Inc. v. Acer America Corp.

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