IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYLINE SOFTWARE SYSTEMS, INC., Plaintiff, v. KEYHOLE, INC., and GOOGLE INC. Defendants.	CIVIL ACTION NO. 06-10980 DPW

MEMORANDUM OF POINTS AND AUTHORITIES IN OPPOSITION TO PLAINTIFF SKYLINE SOFTWARE SYSTEMS, INC.'S MOTION FOR SUMMARY JUDGMENT OF VALIDITY OF THE PATENT-IN-SUIT

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TABLE OF ABBREVIATIONS

Google	Defendants Keyhole, Inc. and Google, Inc.
Skyline	Plaintiff Skyline Software Systems, Inc.
'189 Patent	U.S. Patent No. 6,496,189.
Google Undisputed Facts	Separate Statement of Undisputed Material Facts in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Feiner SJ Decl	Declaration of Professor Steven K. Feiner, Ph.D., in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Chang Decl.	Declaration of Carolyn Chang in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Skyline Validity Mot.	Plaintiff Skyline Software Systems, Inc.'s Memorandum in support of its Motion for Summary Judgment of Validity of the Patent-in-Suit
Skyline Infringement Mot.	Plaintiff Skyline Software Systems, Inc.'s Memorandum in support of its Motion for Summary Judgment of Infringement
Haight Decl.	Declaration of Geri L. Haight, Esq. in support of Plaintiff's Motions for Summary Judgment of Validity and Infringement
Feiner Opp. Decl.	Declaration of Professor Steven K. Feiner, Ph.D., in Support of Defendants' Opposition to Plaintiff Skyline Software Systems, Inc.'s Motions for Summary Judgment of Infringement and Validity
Mewes Decl.	Declaration of Heather N. Mewes in Support of Defendants' Opposition to Plaintiff Skyline Software Systems, Inc.'s Motions for Summary Judgment of Infringement and Validity
Feiner Depo.	Deposition of Steven K. Feiner, taken on January 11, 2006 (Haight Decl., Ex. 42; Mewes Decl., Ex. 7).
Lau Depo.	Depositions of Stephen Lau, taken on June 21, 2006 and June 22, 2006 (Chang Decl., Ex. 14; Haight Decl., Ex. 9; Mewes Decl., Ex. 6).

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MAGIC	Multidimensional Applications and Gigabit Internet Consortium (MAGIC Final Report at GOOG 358) or Multidimensional Applications and Gigabit Internetwork Consortium (MAGIC IEEE Article at GOOG 347).
MAGIC Final Report	Yvan G. Leclerc, "MAGIC Final Report," SRI International, Menlo Park, CA (May 1996), available at http://www.ai.sri.com/~magic/magic-final-report.html (GOOG 000358-70) (Chang Decl., Ex. 21).
MAGIC IEEE Article	Barbara Fuller & Ira Richer, "The MAGIC Project: From Vision to Reality," *IEEE Network*, Vol. 10, No. 3, pp. 15-25 (May/June 1996) (GOOG 000346-25) (Chang Decl., Ex. 22)
TerraVision Tech Note	Y.G. Leclerc & S.Q. Lau, Jr., "TerraVision: A Terrain Visualization System," Technical Note 540, SRI International, Menlo Park, CA (April 22, 1994), available at http://www.ai.sri.com/~magic/terravision.ps.gz or http://www.ai.sri.com/pubs/files/778.pdf (GOOG 000371-390) (Chang Decl., Ex. 23).
TerraVision Video	TerraVision: A High Speed Terrain Visualization System (1994) and Architecture and Initial Performance of TerraVision (1994) (G-T_0018) (Chang Decl., Ex. 24). A transcript of the TerraVision Video was made during the deposition of Stephen Lau (Lau Depo. at 164:19-167:20, 171:6-174:24).
TerraVision Source Code	Source code for TerraVision (G-T_0020) (Chang Decl., Exs. 20 (excerpts), 34).
Clinger, GraphicsNet '95	Marke Clinger, "GraphicsNet '95: Integrated voice, video, graphics and data network using asynchronous transfer mode (ATM)," *ACM SIGGRAPH Computer Graphics*, 30(1), pp. 10-18 (Feb. 1996) (Chang Decl., Ex. 26).
Mayer or '897 patent	U.S. Pat. No. 6,100,897 (Haight Decl., Ex. 51)
T_Vision Project materials	SIGGRAPH '95 Multimedia CD-ROM, \COMUNITY\TVISION (G-T 0021) (Haight Decl., Ex. 30; Mewes Decl., Exs. 2-3).
Terra1995 Video	Video demonstration of T_Vision (G-T_0013) (Mewes Decl., Exs. 4-5)
Migdal or '783 patent	U.S. Pat. No. 5,760,783 (Haight Decl., Ex. 52).

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Cosman Article	Michael Cosman, "Global Terrain Texture: Lowering the Cost," *Proceedings of the 1994 Image VII Conference*, Tempe, Arizona, The IMAGE Society, pp. 53-64 (GOOG 000334-45) (Haight Decl., Ex. 28).

I. INTRODUCTION

Skyline's blunderbuss motion for summary judgment of "validity" ignores the Court's claim constructions, ignores well-established legal standards, and ignores a multitude of genuine disputes of material fact. It is also starkly inconsistent with Skyline's motion for summary judgment of infringement, in which Skyline takes a very different approach to the meaning of the claims in an attempt to capture Google Earth. As detailed below and in the accompanying declaration of Dr. Steven Feiner, there are at least six prior art references that anticipate claims 1 and 12 of the '189 patent and eight prior art references that render these claims obvious.[1] Furthermore, based on the undisputed facts and the correct claim construction, at least one of these references—the public use of the TerraVision application—anticipates claims 1 and 12 as a matter of law. *See* Google's Motion for Summary Judgment of Anticipation Based on the Public Use of TerraVision.

Skyline redefines the Court's claim constructions in an attempt to avoid the prior art. Indeed, on the very first page of its motion, it takes the term "terrain" and equates it with "elevation data." *See* Skyline Validity Mot. at 1 n.1. The Court construed "terrain" to mean the "surface features of an area of land, an object, or a material, *including color, elevation, and existing objects or structures on the land, object or material*." Chang Decl., Ex. 4 at 19 (emphasis added). Thus, while "terrain" includes elevation data, it also includes "color" (image data) and "existing objects or structures on the land, object or material" (also image data in the Court's construction). *Id.* at 17-19; Feiner Opp. Decl. ¶ 32. Likewise, while Skyline accuses Google of an "overwrought application of the Court's claim construction" in its motion for infringement, it applies this same "overwrought" construction in its validity motion, claiming

[1] There are actually more, but Google submits that these references are sufficient to defeat summary judgment of validity. *See, e.g.*, Feiner SJ Decl., Ex. D. Google expressly reserves the right to subsequently raise other prior art references.

that the prior art fails to disclose a "renderer," for example. *Compare* Skyline Infringement Mot. at 1, 17-21 *with* Skyline Validity Mot. at 21, 29-30. Skyline cannot have it both ways—either Google Earth does not have a "renderer" and does not infringe claims 1 and 12 of the '189 patent, or these claims are invalid.

Skyline also overstates and ignores relevant legal standards. It claims that anticipation is a question of law, but the Federal Circuit has repeatedly held that "[a]nticipation is a question of fact…." *See Minn. Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1301 (Fed. Cir. 2002). Likewise, the ultimate determination of obviousness may be a question of law, but it is based on four groups of factual findings: (1) the scope and content of the prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art; and (4) any relevant secondary considerations, including commercial success, long felt but unsolved needs, and failure of others. *Dystar Textilfarben GMBH & Co Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006).

It is true that the prior art must be enabling. *See Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1471 (Fed. Cir. 1997). However, an anticipating reference constitutes an enabling disclosure when the reference describes the invention "at a level of detail similar to [that] contained in the patent." *Id.* It is also true that there must be a motivation to combine for obviousness. *Dystar*, 464 F.3d at 1360. However, there is no "rigid categorical rule" and the Federal Circuit has made clear in its recent jurisprudence that this motivation can come from "common knowledge, the prior art as a whole, or the nature of the problem itself," and need not be explicit. *Id.* at 1361; *see also Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1291 (Fed. Cir. 2006); *Ormco Corp. v. Align Technology, Inc.*, 463 F.3d 1299, 1307-08 (Fed. Cir. 2006).

And yes, invalidity must be proven by clear and convincing evidence. *Freedman Seating*

Co. v. American Seating Co., 420 F.3d 1350, 1363-64 (Fed. Cir. 2005). However, on a motion for summary judgment of non-obviousness, for example, the non-movant "only need[s] to show the existence of a genuine issue of material fact in order to preclude summary judgment." *Id.* (summary judgment reversed where "record, although not clearly and convincingly demonstrating obviousness, was sufficient to create a genuine issue of material fact").

Finally, while ignoring the undisputed facts regarding the public use of the TerraVision application, Skyline glosses over what are clearly at least material factual disputes over the scope and content of other prior art and over whether this prior art was enabling. "Summary judgment is only appropriate if the evidence fails to create a genuine issue of material fact." *Medical Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1220, 1221-22 (Fed. Cir. 2003) (reversing summary judgment of non-obviousness due to genuine issues of material fact). While Skyline claims that all the prior art references fail to teach the interactive downloading of elevation data on an as-needed basis, it ignores contrary evidence showing that both image *and* elevation data were downloaded in this manner. While Skyline dismisses some references as "high-level overviews," it ignores enabling disclosures in these references comparable to the disclosures in the '189 patent. Indeed, Skyline even argues that one of the prior art references was a "mere concept," in the face of evidence describing it as "The (already existing and working) Prototype." *See* Mewes Decl., Ex. 3 (RENDERER.HTM at p. 1). Skyline makes no real attempt to rely on only undisputed facts and instead simply regurgitates its expert's conclusory opinions in the form of a motion.

Skyline's motion is but an attempt to cast a "fog" to induce the Court to reject Google's concurrent motion addressed to anticipation of the '189 patent based on the public use of the TerraVision application. The Court should see through that ruse and deny Skyline's motion for

summary judgment of validity because Skyline applies incorrect and inconsistent claim constructions, because it misapplies the legal standards, and because it ignores genuine issues of material fact in dispute.

II. THE TERRAVISION PRIOR ART INVALIDATES CLAIMS 1 AND 12

The TerraVision prior art alone provides a compelling basis for denying Skyline's motion for summary judgment of validity. Google has even concurrently moved for summary judgment of anticipation based on the prior public use of the TerraVision application. There is no genuine and material dispute regarding how this application worked, and the only alleged differences between the TerraVision application and claims 1 and 12 of the '189 patent rest on Skyline's misreading of the Court's construction of the term "data blocks describing three-dimensional terrain." Both the MAGIC Final Report and the MAGIC IEEE article also each separately provide clear and convincing evidence that claims 1 and 12 of the '189 patent are invalid for anticipation, even under Skyline's tortured reading of the claims. The combination of all three of the TerraVision prior art references would at least render obvious claims 1 and 12.

TerraVision was a "high-speed graphics application that allow[ed] a user to interact in real time with a synthetic 3D photo-realistic view of a large terrain." Chang Decl. Ex. 21 (MAGIC Final Report at GOOG 362). The "design goal" of TerraVision was not limited to visualizing Fort Irwin, California—TerraVision could be used to visualize any large terrain, including the United States, the world and even other planets. *See, e.g., id.* at GOOG 358 (Fort Irwin data set was "proof-of-concept" and user could "roam over arbitrarily large databases"), 369 (noting use of TerraVision by researchers at NASA Goddard and the Jet Propulsion Laboratory)*; see also* Haight Decl., Exs. 12-14.

There are at least three relevant TerraVision prior art references: (1) the public use of the TerraVision application (the subject of Google's Motion for Summary Judgment of

Anticipation); (2) the publication of the MAGIC Final Report; and (3) the publication of the MAGIC IEEE Article. Feiner Opp. Decl. ¶¶ 31, 37-69.[2] In its motion, Skyline deliberately conflates these references, and fails to offer any real analysis of whether the MAGIC Final Report or the MAGIC IEEE Article separately anticipates the claims. *See, e.g.*, Skyline Validity Mot. at 21-22 (dismissing these references as high-level overviews without citation to any evidence). That each separately anticipates is particularly important because the MAGIC Final Report and the MAGIC IEEE Article contain broader disclosures that were not implemented in the TerraVision application—disclosures which clearly anticipate claims 1 and 12 even under Skyline's construction of the term "data blocks describing three-dimensional terrain. In addition, the TerraVision application anticipates claims 1 and 12 when the Court's constructions are fairly read. *See* Google's Motion for Summary Judgment of Anticipation. At a minimum, it would have been obvious to one of ordinary skill in the art to modify the TerraVision application to implement the broader systems suggested and described in the MAGIC Final Report and the MAGIC IEEE Article.

A. The Public Use of the TerraVision Application Anticipates Claims 1 and 12

1. *Skyline Mischaracterizes the Scope and Content of the Public Use of the TerraVision Application and the (Lack of) Differences Between It and the Claimed Invention*

Neither Google nor Dr. Feiner contest that, in the public use of the TerraVision application, DEM (elevation data) tiles were downloaded from a remote server during initialization, before the OI (image data) tiles. *See, e.g.*, Feiner SJ Decl ¶¶ 53, 78; Haight Decl,

[2] Under section 102(b), a reference constitutes prior art if it was "patented," if it was "described in a printed publication" or if it was "in public use." In its motion, Skyline does not contest that the MAGIC Final Report and the MAGIC IEEE Article were both printed publications. *See* Skyline Validity Mot. at 7 n.7. Skyline does appear to contest that the TerraVision application was in public use, but there is overwhelming and undisputed evidence on this point. *See, e.g.*, Google Undisputed Facts ¶ 60. In addition, as detailed herein, the allegedly "contrary" evidence relied on by Skyline is from obsolete legacy source code and outdated documents.

Ex. 42 (Feiner Depo. at 41:4-9). This is immaterial, however, in the face of clear and incontrovertible evidence that the OI tiles were downloaded according to the method and apparatus of claims 1 and 12 of the '189 patent. *See* Google's Motion for Summary Judgment of Anticipation. Google does contest Skyline's further assertions that the TerraVision application was a 2D visualization system, that it obtained DEM tiles locally from a disk and that Dr. Feiner's expert analysis was based entirely on his observation of TerravVision at SIGGRAPH '95. None of these assertions find support in the evidence.

Skyline asserts that the TerraVision application was really a 2D visualization system. *See* Skyline Validity Mot. at 9. But the very document cited by Skyline makes clear that the objective of TerraVision was to allow the user to see "three-dimensional (3-D) photorealistic, computer-generated images of a very large area of interest," and the approach was "to retrieve elevation data and specially processed aerial photographs from a high-speed image server system (ISS) in real time as they are needed for image generation." Haight Decl., Ex. 13 at p. 1. Even earlier reports confirmed that TerraVision was always designed to provide 3D visualization. *See, e.g., id.*, Ex. 12 at pp. 1, 8 (noting delay in delivery of DEM tiles). By April 1993—years before the application for the '189 patent—the TerraVision application provided both image data (OI tiles) and elevation data (DEM tiles) to a renderer for rendering three-dimensional terrain. *See, e.g., id.*, Ex. 13 at p. 3.

Next, Skyline cites obsolete legacy source code functions and outdated documents in an attempt to show that the TerraVision application did not download data blocks describing three-dimensional terrain, but instead obtained these blocks locally from a disk. *See* Skyline Validity Mot. at 9-11.

As an initial matter, Skyline completely ignores the downloading of additional data blocks with image data (OI tiles) that were also used in TerraVision to render the three-dimensional terrain. These image data blocks "represent[] or describe[] a section of three dimensional terrain," and are therefore "data blocks describing three-dimensional terrain." Chang Decl., Ex. 4 at 11; *see also* Feiner SJ Decl. ¶¶ 63, 77-78; Feiner Opp. Decl. ¶¶ 32-33. There is also no genuine dispute that these OI tiles were downloaded interactively on an as-needed basis in exactly the manner claimed by the '189 patent and were not obtained locally from a disk. *See* Google Undisputed Facts ¶¶ 84, 86-88. Thus, under a proper reading of the Court's claim construction, the download of these OI tiles satisfies the claims. Furthermore, while Skyline compares TerraVision to the prior art distinguished by Skyline in the specification of the '189 patent, none of this prior art downloaded image data in the manner of TerraVision (this prior art stored all data used for rendering either locally or on CD-ROMs). *See* '189 patent at col. 1:48-61.

Skyline's argument that the TerraVision application publicly used at SIGGRAPH '95, Supercomputing '95, and the Second MAGIC Symposium (as well as other demonstrations), obtained DEM tiles from a disk rather than from a remote server is belied by the very documents and source code cited by Skyline. Skyline cites outdated documents and obsolete legacy source code to create an apparent contradiction where none exists. Skyline points to Quarterly Reports and other documents dating from *prior to 1995* or misstates the content of documents dated *after 1995*. *See, e.g.*, Skyline Validity Mot. at 9-11.

For example, Skyline claims that the Quarterly Report from April 1995 (covering the period from January to March) includes the statement: "The digital elevation model (DEM) tiles are stored locally on disk." *Id.* at 9. In fact, this report states: "*Before* getting the new ISS

[remote server] software, the DEM tiles were read from local disk during the initialization of the application. *Now, when a user selects a data set from the DSM, the DEM tiles are requested from the ISS*." Haight Decl., Ex. 18 at p. 4 (emphasis added). Likewise, the TerraVision Tech Note (which originally dates from October 1993, *see* Haight Decl., Ex. 15 at GOOG 26542) does not say that the DEM tiles were obtained from disk. Rather, it says that the DEM tiles "will be *retrieved* only once when the area of interest is chosen by the user." Chang Decl., Ex. 23 at GOOG 388 (emphasis added). In light of other disclosures in the Tech Note (*e.g.*, "the terrain database can be remote") it is clear that the DEM tiles were *retrieved* from a remote database, not local storage. *See, e.g., id.* at GOOG 373 (describing advantages of storing terrain database remotely, including being able to exceed the local storage capacity and to update the data centrally).

Skyline also carefully omits discussion of the source code functions that were developed after the obsolete legacy functions it cites. There is no dispute that the TsReadDems() function in the TerraVision source code operated to read the DEM tiles from a disk. Feiner SJ Decl. ¶ 61. This TsReadDems() function also appears to be consistent with the pre-1995 Quarterly Reports describing the "first phase" of the TerraVision application, where DEM tiles were stored locally on disk and only OI tiles were stored remotely on the ISS server. *See, e.g.*, Haight Decl., Ex. 14 at p. 2; *id.*, Ex. 15 at p. 2; *id.*, Ex. 16 at p. 5; *id.*, Ex. 17 at 3;

However, there is also no dispute that this TsReadDems() function was later made obsolete by source code that requested and retrieved the DEM tiles from the remote server, rather than from a disk. Google Undisputed Facts ¶¶ 85, 92-93. Skyline nonetheless trumpets a comment in the TsReadDems() function, that, "[t]his is a hack until we can get the TSM [remote server software] to send us the DEMs." Skyline Validity Mot. at p. 11. But by December 1994,

a function called TsRequestDems() had been added to the source code, and this function operated to "get the TSM to send us the DEMs." Chang Decl., Exs. 20, 34; Feiner SJ Decl ¶¶ 61, 77-78. There is no genuine dispute that it is this TsRequestDems() function that is called in the TerraVision source code, and that it is only by setting a special flag that a user could call the obsolete TsReadDems() function to get what the source code comments referred to as the "CHEESY LOCAL DEMS." *Id.*

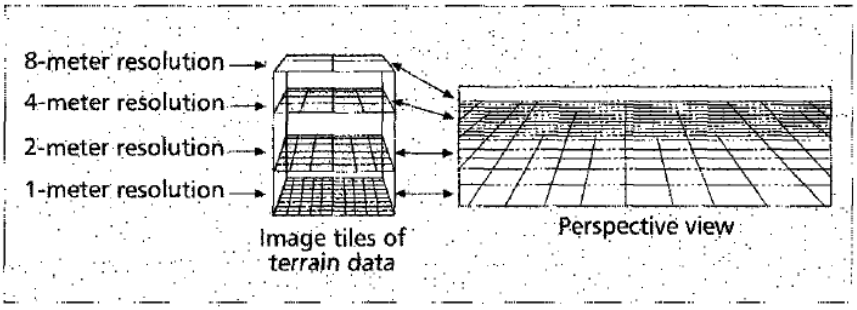
Skyline's assertion that Dr. Feiner's expert opinions are based entirely on his observation of TerraVision at SIGGRAPH '95 is baseless. *See* Skyline Validity Mot. at 19. Dr. Feiner attended SIGGRAPH '95 and saw TerraVision demonstrated (and it was not just a video). Feiner Opp. Decl. ¶ 39. As clearly set forth in his expert report and in his declarations, however, Dr. Feiner's opinions regarding the public use of the TerraVision application include a careful analysis of the source code, of the testimony of Stephen Lau (one of the inventors of TerraVision and the person who publicly demonstrated TerraVision at SIGGRAPH '95, Supercomputer '95, and the Second MAGIC Symposium, among other demonstrations), and of reams of documentation and videos about the TerraVision application. Feiner Opp. Decl. ¶ 39 & Feiner SJ Decl, Ex. D at ¶¶ 24-31. Dr. Feiner's opinions are also not contradicted by the contemporaneous documents—the documents from prior to 1995 are describing an older version of the TerraVision application. *Id.*

2. *Under a Proper Reading of the Court's Claim Construction, the Public Use of the TerraVision Application Anticipates Claims 1 and 12*

i. Skyline misreads the Court's construction of the term "data block describing three-dimensional terrain"

Throughout its motion, Skyline relies on the erroneous assumption that the only "data block describing three-dimensional terrain" is a data block with elevation data. *See, e.g.*, Skyline Validity Mot. at 23-25. Such assumption runs contrary to the Court's construction of the term

"terrain," which makes clear that this term is not interchangeable with "elevation," but also includes any "color" and "existing objects or structures on the land, object or material" (image data in the Court's construction). Chang Decl., Ex. 4 at 18-19.[3] The term "*three-dimensional* terrain," furthermore, is not a synonym for "elevation." In order to render *three-dimensional* terrain, image data is combined with elevation data. *Id; see also* Feiner Opp. Decl. ¶¶ 33, 43. Indeed, image data is used to create perspective, or the illusion of depth, as shown in the MAGIC IEEE Article:



■ Figure 3. *Relationship between tile resolutions and perspective view. (Source: SRI International)*

Chang Decl., Ex. 22 at GOOG 349; Feiner Opp. Decl. ¶¶ 32-33; *see also* '189 patent, Fig. 7 (perspective view). Thus, both image data blocks (OI tiles in TerraVision) and elevation data blocks (DEM tiles) individually constitute "data blocks describing three-dimensional terrain" as they "represent[] or describe[] a section of three-dimensional terrain at a particular resolution level." Chang Decl., Ex. 4 at 12.[4]

[3] "Drawables" or "vector data" are not "terrain" in the Court's construction. *See* Chang Decl., Ex. 4 at 18-19. However, in the '189 patent, data blocks with vector data nonetheless constitute "data blocks" describing three dimensional terrain." *Id.* at 11 (construing this term to include "any additional data overlaid on the digital image of the terrain, such as altitude, labels or optional objects).

[4] Dr. Feiner did not agree that "terrain" data typically refers to elevation data. *See* Skyline Validity Mot. at 24. The cited portion of his deposition states that in Google Earth, elevation data was referred to as terrain data, but that "I don't think that they decided on calling it terrain data in – taking into account the claim construction." Haight Decl., Ex. 42 (Feiner Depo. at 14-15).

This reading of the Court's claim construction does not convert the '189 patent to "merely a 2D system." Skyline Validity Mot. at 24. Google is not contending that a system that renders only image data anticipates the claims. TerraVision is a system that provides both image data blocks and elevation data blocks to a renderer for rendering (i.e., a 3D terrain visualization system) and it anticipates the claims because it downloads additional image data blocks in exactly the manner taught by the '189 patent.

Such reading does not erase the distinctions between the '189 patent and the prior art described in the specification or the prosecution history. *See, e.g.*, '189 patent at col. 1:14-60; Chang Decl., Ex. 2 at GOOG 117-19, 151-54. The patent distinguishes prior art systems that displayed only still images or streaming video, but this art was distinguished on the ground that the user could not explore the terrain interactively. '189 patent at col. 1:33-40. TerraVision, by contrast, overcame this problem: in TerraVision, the user could "interact in real time with a synthetic 3D photo-realistic view of a large terrain." Chang Decl., Ex. 21 at GOOG 362; *see also id.*, Exs. 20 & 22 at GOOG 349-50.

The patent distinguishes prior art systems that used computer storage space or a CD-ROM to store the required data for exploring the terrain interactively. '189 patent at col. 1:41-60. TerraVision, however, stores data remotely, just like the '189 patent because the data volume is very large "so it might not be feasible to transfer it to the user's site" and because it "simplif[ies] maintenance and updates." Chang Decl., Ex. 22 at GOOG 351; *see also id.*, Exs. 20 & 21 at GOOG 358. These are exactly the same reasons cited by the patent for the remote storage of data. '189 patent at col. 1:49-60.

In the prosecution history, the patentee distinguished the Migdal prior art, but it did so only by arguing that Migdal did not disclose a download order based on resolution levels. Chang

Decl., Ex. 2 at GOOG 117-19, 151-54. TerraVision, however, downloads all tiles in coarse-to-fine order, i.e., based on resolution levels. *See, e.g., id.*, Exs. 20, 21 at GOOG 364 & 22 at GOOG 351. Moreover, despite Skyline's present argument that Migdal only disclosed downloading 2D image data, and not elevation data, it made no such distinction in the prosecution history; indeed, it even acknowledged that "Migdal discloses how the processor creates the initial data blocks (clip maps) from the larger terrain image (texture map) and the subsequent storage of those data blocks (clip maps) in local memory." *Id.*, Ex. 2 at GOOG 152. A person of ordinary skill in the art would understand from these admissions that downloading data blocks with image data for the purpose of rendering three-dimensional terrain satisfies the claims. *See, e.g.*, Feiner Opp. Decl. ¶¶ 109-112.

The only other reasonable way to read the Court's construction of a "data block describing three-dimensional terrain" is that each data block must have "color," "elevation," "existing objects or structures on the land," and "any additional data overlaid on the digital image of the terrain, such as altitude, labels or optional objects" in order to constitute a "data block describing three-dimensional terrain." This interpretation is consistent with the preferred embodiment of the '189 patent, where each data block is made up of pixels having both color and elevation attributes, and has an attachment field in which additional optional data objects associated with the area are described. *See* '189 patent at col. 8:32-40. Moreover, there is no written description in the specification disclosing any embodiment where data blocks with elevation data, data blocks with image data and data blocks with vector data were downloaded separately, and no teaching in the specification explaining how these data blocks with different types of data should be combined for rendering in real-time. *See, e.g.*, Feiner Opp. Decl. ¶¶ 34-35. Indeed, Skyline avoided the alleged difficulties involved in combining data blocks of

different types of data in real time for rendering precisely by having a single data block with all the image, elevation and vector data for an area. *Id.* However, under this construction, Google Earth cannot infringe because, like the prior art, it has separate data blocks made up of only image data, only elevation data and only vector data. *See* Google's Motion for Summary Judgment of Noninfringement at 16-17.

ii. In the publicly used TerraVision application, data blocks with image data were downloaded according to the method of the '189 patent

There is no genuine dispute that the publicly used TerraVision application downloaded OI tiles interactively and on an as-needed basis in the same manner as the '189 patent, and then used these data blocks to render three-dimensional terrain. Google Undisputed Facts ¶¶ 66-68, 84, 86-88. There is also no dispute that in downloading additional OI tiles, the TerraVision application made a determination that the block provided from local memory was not at the indicated resolution level. *Id.*¶ 86. The TerraVision application was fully enabled, and implemented in source code. Chang Decl., Exs. 20, 34. Skyline's motion fails to argue that any other limitations of claims 1 and 12 of the '189 patent were lacking in the TerraVision application. Skyline Validity Mot. at 20-22; *see also* Feiner SJ Decl ¶¶ 62-78 & Feiner Opp. Decl. ¶¶ 42-61 (identifying relevant disclosures in the TerraVision application on an element-by-element basis). Accordingly, Skyline's motion for validity should be denied on these grounds, and Google's motion for summary judgment of anticipation based on the public use of the TerraVision application should be granted.

B. The Publication of Either the MAGIC Final Report or the MAGIC IEEE Article Also Anticipates Claims 1 and 12

1. *Skyline Mischaracterizes the Scope and Content of the MAGIC Final Report and the MAGIC IEEE Article and the (Lack of) Differences Between Them and Claimed Invention*

Skyline's motion glosses over the MAGIC Final Report and the MAGIC IEEE Article. Indeed, these references are suspiciously missing from Skyline's description of "TerraVision." *See* Skyline Validity Mot. at 8-11. Skyline's motivation is clear: in contrast to the TerraVision application, both the MAGIC Final Report and the MAGIC IEEE Article further disclose that elevation data, just like image data, should be downloaded interactively and on an as-needed basis in the same manner as the '189 patent. The MAGIC IEEE Article provides that "[t]he ISS [the remote server] stores, organizes, and retrieves the processed imagery and elevation data required by TerraVision *for interactive rendering of the terrain*." Chang Decl., Ex. 22 at GOOG 350 (emphasis added); *see also id.* at GOOG 351 (describing how tiles are interactively downloaded in coarse-to-fine order on an as-needed basis). The MAGIC Final Report provides that "[TerraVision] combines elevation data, aerial photographs, models of buildings, and models of vehicles whose positions were obtained using GPS receivers, *all stored in a remote terrain database (ISS) accessed via a high-speed network*." *Id.*, Ex. 21 at GOOG 362 (emphasis added). The report further discloses a download strategy whereby tiles (whether OI or DEM tiles) are interactively downloaded in coarse-to-fine order on an as-needed basis. *Id.* at GOOG 363-64.

There is nothing in either the MAGIC Final Report or the MAGIC IEEE Article which indicates that elevation data should be stored on a disk rather than the remote server. Chang Decl., Exs. 21-22. There is also nothing in either of these references which indicates that elevation data should be treated any differently than image data. *Id.* Thus, a person of ordinary

skill in the art would recognize from the broad disclosures in the MAGIC Final Report and the MAGIC IEEE Article that elevation data should be downloaded in the same manner as image data. Feiner Opp. Decl. ¶¶ 34-35, 60. This is not a case of "inherent anticipation," as suggested by Skyline: the MAGIC Final Report and the MAGIC IEEE Article *explicitly* state that DEM and OI tiles are stored remotely and that these tiles should be downloaded interactively on an as-needed basis. Chang Decl., Exs. 21-22.

In its motion, Skyline asserts that the MAGIC Final Report and the MAGIC IEEE Article "confirm that the 3D elevation data was not streamed, as needed, from a remote server." Skyline Validity Mot. at 21-22. Skyline fails to cite anything in the MAGIC Final Report for this proposition, however. As anticipation looks to a "*single* prior art reference," Skyline's citation to other references with different disclosures is of no legal consequence. *See, e.g., Northpoint Tech., Ltd. v. MDS America, Inc.*, 413 F.3d 1301, 1312 (Fed. Cir. 2005) (five prior art references "provided separate factual bases" for anticipation and inadequacies in one reference do not undermine others). Skyline's out-of-context citation to the MAGIC IEEE Article misleadingly suggests that this article teaches that only image data and not elevation data is downloaded interactively. Skyline Validity Mot. at 22. The MAGIC IEEE article does state that "TerraVision is designed to use imagery data that are located remotely and supplied to the application as needed by means of a high-speed network." Chang Decl., Ex. 22 at GOOG 349. But the very same paragraph uses the term "aerial or satellite imagery" to refer to data derived from "raw imagery *and elevation information*." *Id.* (emphasis added). The article further discloses that "tiles" (referring to both OI and DEM tiles) "were then stored on the distributed servers of the ISS and used by terrain visualization software residing on rendering engines at several locations." *Id.* If there were any doubt, the MAGIC IEEE Article unequivocally states

on the next page that imagery and elevation data are remotely stored for "interactive rendering of the terrain." *Id.* at GOOG 350.

Skyline argues that these disclosures are not enabling, without citing any evidence. *See* Skyline Validity Mot. at 21 (claiming that MAGIC Final Report and MAGIC IEEE are "high-level overviews"). The MAGIC Final Report and the MAGIC IEEE Article contain disclosures at least "at a level of detail similar to [that] contained in the patent." *Motorola*, 121 F.3d at 1471; *see also Fonar Corp. v. GE*, 107 F.3d 1543, 1549 (Fed. Cir. 1997) (holding that, as a general rule, disclosure of software functions is sufficient to satisfy patentee's best mode requirement because "normally, writing code for such software is within the skill of the art, not requiring undue experimentation, once its functions have been disclosed"). Although the MAGIC Final Report and the MAGIC IEEE Article do not include source code, neither does the '189 patent. In stark contrast to its position here, Skyline claimed in its motion for summary judgment of infringement that "[t]he '189 patent is not concerned with methods of software coding." Skyline Infringement Mot. at 25. Again, Skyline cannot have it both ways. If the '189 patent does not require source code to be enabling, then neither does the prior art. *Motorola*, 121 F.3d at 1471. Both the MAGIC Final Report and the MAGIC IEEE Article contain detailed disclosures functionally describing how tiles should be downloaded interactively on an as-needed basis from a remote server, in no less detail than the '189 patent describes the downloading of its "data blocks describing three-dimensional terrain." Feiner Opp. Decl. ¶¶ 34-35, 60-61; *see also, e.g.*, Chang Ex. 21 at GOOG 362-65 & Ex. 22 at GOOG 349-52. In some cases, these disclosures are even more detailed than what is contained in the '189 patent. *Compare id.* with '189 patent. Moreover, these disclosures are more than sufficient to enable a person of ordinary skill in the art to carry out the invention. *See* Feiner Opp. Decl. ¶¶ 34-36; *Motorola, Inc.*, 121 F.3d at 1471. At

a minimum, there is a genuine dispute of material fact of this issue—while enablement is a question of law, "it is based on underlying findings of fact." *Warner-Lambert Co. v. Teva Pharmaceuticals USA, Inc.*, 418 F.3d 1326, 1337 (Fed. Cir. 2005).

Finally, Skyline asserts, without citing any evidence, that the MAGIC Final Report and the MAGIC IEEE Article did not disclose the three functions of a renderer. Skyline Validity Mot. at 21. Both the MAGIC Final Report and the MAGIC IEEE Article disclose a search algorithm used to identify all the visible tiles at the appropriate resolution level. *See, e.g.,* Chang Decl., Ex. 21 at GOOG 363 (identifying tile visibility and rendering threads) & Ex. 22 at GOOG 350 ("A high-speed search algorithm is used to identify the tiles required to render a given view."). These visible tiles are referenced using geographic coordinates, or "coordinates in the terrain." *Id.*, Ex. 21 at GOOG 359 & Ex. 22 at GOOG 350. The MAGIC Final Report and the MAGIC IEEE Article further disclose that a small fraction of the available tiles are stored in local cache so that TerraVision is able to display a new view at any time, no matter how quickly the user moves. *Id.*, Ex. 21 at GOOG 364 (small fraction of tiles kept in local cache) & Ex. 22 at GOOG 351 (same). Based on these disclosures, a person of ordinary skill in the art would understand that the renderer must request and receive these data blocks from local memory and use them to display a three-dimensional image. Feiner Opp. Decl. ¶ 55-56. At a minimum, these disclosures satisfy Skyline's loose interpretation of the Court's construction of "renderer" offered in Skyline's motion for summary judgment of infringement. *Id.* Thus, if the prior art does not have a renderer under Skyline's interpretation, then neither does Google Earth.

2. *Under Skyline's View of the Court's Claim Construction, the MAGIC Final Report and the MAGIC IEEE Article Anticipate Claims 1 and 12*

Even assuming that a "data block describing three-dimensional terrain" can only be a data block with elevation data, both the MAGIC Final Report and the MAGIC IEEE Article

disclose downloading DEM tiles with elevation data interactively and on an as-needed basis in the same manner claimed by the '189 patent. *See* Feiner Opp. Decl. ¶¶ 60-61. Thus, at a minimum, there is a dispute of fact over this issue and over whether these disclosures are enabling, which would preclude summary judgment in favor of Skyline. If Skyline's interpretation of the term "renderer" is accepted for purposes of Skyline's motion for infringement, then Skyline must concede that the MAGIC Final Report and the MAGIC IEEE Article also disclose a "renderer." *See id.* ¶¶ 46-47. Again, at a minimum, there is a dispute of fact over this issue. Skyline does not argue that any other limitations of claims 1 and 12 of the '189 patent were absent from the MAGIC Final Report or the MAGIC IEEE Article. Skyline Validity Mot. at 20-22; *see also* Feiner SJ Decl ¶¶ 62-78 & Feiner Opp. Decl. ¶¶ 42-61 (identifying relevant disclosures in the MAGIC Final Report and the MAGIC IEEE Article on an element-by-element basis). Accordingly, Skyline's motion for validity should be denied on these grounds.

C. The Combination of the TerraVision Prior Art and the Knowledge of One of Ordinary Skill Renders Claims 1 and 12 Obvious

As detailed above, there are at least genuine disputes of material fact regarding the scope and content of the prior art and the differences between the claimed invention and the prior art. *See, supra*, Parts II.A.1 & II.B.1. There are also at least genuine disputes of material fact regarding the level of ordinary skill in the art—Skyline contends, without citing any evidence, that a person of ordinary skill would have been incapable of writing source code to download DEM tiles in the manner described by the MAGIC Final Report and the MAGIC IEEE Article and that this person also would have been incapable of modifying the TerraVision application source code to this end. *See, e.g.*, Skyline Validity Mot. at 21, 25-26. To the contrary, Google has submitted evidence that these tasks were well-within the capabilities of a person of ordinary

skill in the art. *See* Feiner Opp. Decl. ¶¶ 34-35. Moreover, given that the '189 patent also does not contain the "detailed disclosures" Skylines asserts are necessary to practice claims 1 and 12 (including disclosures about how to download and combine for rendering in real time data blocks with only image data, only elevation data and only vector data), then either these claims fail to satisfy the written description and enablement requirements of 35 U.S.C. § 112, or the prior art is sufficiently enabled. *Id.*

Finally, Google disputes the only alleged secondary consideration relied on by Skyline—failure of others—the evidence shows that the developers *succeeded* in downloading OI tiles in the same manner claimed in the patent and then decided to adopt to a simplified resolution determination algorithm rather than download DEM tiles in the same way. Haight Decl., Ex. 18 at p.4. Thus, on all four factual underpinnings of the obviousness inquiry, there are genuine disputes of material fact, and summary judgment should be denied. *See, e.g.*, *Medical Instrumentation and Diagnostics*, 344 F.3d at 1221-22 (reversing summary judgment of non-obviousness due to genuine issues of material fact).

On motivation to combine, Skyline cannot genuinely dispute that a person of ordinary skill in the art would have been motivated to combine the TerraVision application with the MAGIC Final Report and the MAGIC IEEE Article. Feiner Opp. Decl. ¶¶ 63-64. This is not "impermissible hindsight." *See* Skyline Validity Mot. at 22. These references all refer to the same project and system. Feiner Opp. Decl. ¶ 63. The references would thus naturally be read together by someone wanting to know about the TerraVision system. Even assuming *arguendo* that Skyline's reading of the Court's claim construction is correct such that the downloading of additional OI tiles does not satisfy the requirement of downloading additional "data blocks describing three-dimensional terrain," and that a person of ordinary skill in the art would be

incapable of carrying out the directions in the MAGIC Final Report and the MAGIC IEEE Article to download both additional OI tiles and additional DEM tiles, then claims 1 and 12 would have at least been obvious in light of these references. *Id.* ¶ 62. In particular, to the extent that Skyline claims that the MAGIC Final Report and MAGIC IEEE Article lacked necessary "detailed disclosures" regarding a "renderer," these detailed disclosures are found in the TerraVision application, and taken together are thus fully enabled. *Id.* ¶ 63.

Furthermore, at a minimum, the MAGIC Final Report and the MAGIC IEEE article explicitly teach that DEM tiles should be downloaded in the same manner as OI tiles. *See* Chang Decl., Ex. 21 at GOOG 362-64 & Ex. 22 at GOOG 350-51. Thus, far from "teaching away," these references include an explicit suggestion to modify the TerraVision application to download DEM tiles according to the claimed method. Feiner Opp. Decl. ¶ 64. Google relies upon this "explicit teaching or suggestion," not just the purported knowledge of one of ordinary skill in the art. *But see* Skyline Validity Mot. at 26-27. TerraVision also included many relevant functions for implementing this method that could be (and in part already were) used to download DEM tiles. Feiner Opp. Decl. ¶¶ 66-69. Modifications to TerraVision's method for downloading DEM tiles would have been well within the capabilities of one of ordinary skill in the art. *Id.* ¶ 69.

Finally, Skyline is mistaken that development of the TerraVision application represents a "failure of others." *See* Skyline Validity Mot. at 26. First, the evidence is undisputed that in the TerraVision application, both OI and DEM tiles were obtained from a remote server and at least the OI tiles were downloaded in the same manner as the claims of the '189 patent. Google Undisputed Facts ¶¶ 84-88. Second, the fact that the designers of the TerraVision application ultimately employed an optimization to simplify their resolution determination algorithm for use

with a smaller dataset does not mean they were incapable of writing source code that would download DEM tiles in the same way as OI tiles were downloaded. Feiner Opp. Decl. ¶¶ 67-68. Third, as indicated by the MAGIC Final Report and the MAGIC IEEE Article, the designers of the TerraVision application conceived of and disclosed systems that downloaded both OI and DEM tiles in the same manner as the claims of the '189 patent for use with larger datasets. Chang Decl., Ex. 21 at GOOG 362-64 & Ex. 22 at GOOG 350-51.

There is at minimum a genuine dispute of material fact as to whether the combination of the TerraVision prior art references would have rendered obvious claims 1 and 12, and, accordingly, Skyline's motion should be denied on this ground as well.

III. THE T_VISION PRIOR ART INVALIDIATES CLAIMS 1 AND 12

The T_Vision prior art provides additional grounds for denying Skyline's motion for summary judgment of validity. Skyline ignores numerous factual disputes precluding summary judgment, including disputes over the scope and content of the T_Vision prior art references, over differences between the claimed invention and the prior art, and over the level of ordinary skill in the art. *See, e.g., Medical Instrumentation*, 344 F.3d at 1221-22. Skyline also again conflates references, and picks and chooses some disclosures while ignoring others.

T_Vision was a method and device for the pictorial representation of space-related data, for example, geographical data of the earth. *See, e.g.*, Haight Decl., Ex. 51 ('897 patent at Abstract); Mewes Decl., Ex. 3 (SIGGRAPH '95 T_Vision Project, TVISION.HTL at p.1 ("T_Vision is an earth visualization project.")). There are at least three relevant T_Vision prior art references: (1) the Mayer patent, claiming priority from a German patent application filed in December 1995 (Haight Decl., Ex. 51); (2) the publication of materials describing the T_Vision Project on the SIGGRAPH '95 Multimedia CD-ROM in July 1995 (Mewes Decl., Ex. 2); and (3) the public use of T_Vision at SIGGRAPH '95 in August 1995. Feiner Opp. Decl. ¶¶ 71-107.

A. Skyline Mischaracterizes the Scope and Content of the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application

Skyline mischaracterizes the system described in the Mayer patent. As properly understood by a person of ordinary skill in the art, in at least one preferred embodiment shown in Figure 2, the Mayer patent discloses a remote server (primary node 1) and a client computer (tertiary node 3) connected via a communications link (interchange network 7):

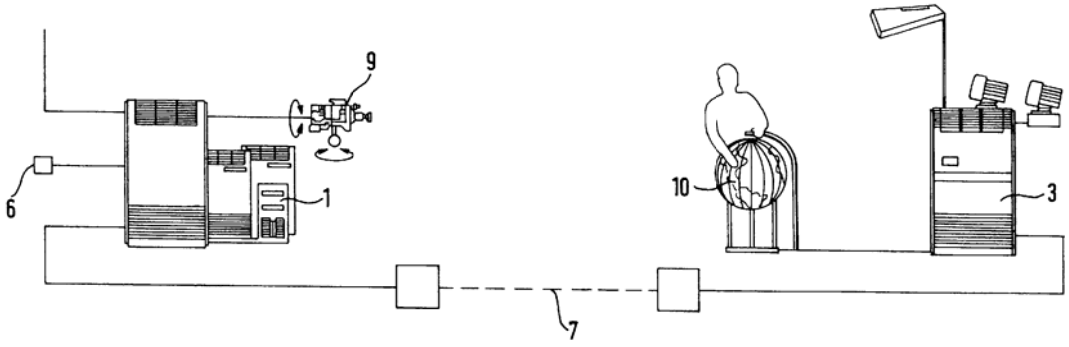
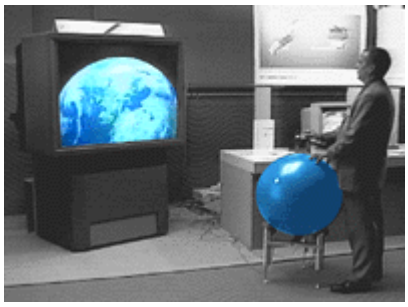


FIG. 2

Haight Decl., Ex. 51 ('897 patent at 2:51-56, 5:61-66, 6:12-21, 6:64-7:7, 7:42-54, 8:28-42 & Figs. 1-2); *see also* Feiner Decl. ¶¶ 85, 92, 95-97, 103-04. The node 3 client computer is also connected to an input medium 10 (the three-dimensional track ball in Figure 2, or a mouse) and a display. *Id.* The user manipulates the trackball to navigate the terrain and select a location and direction of view. *Id.* The client node 3 then uses data blocks provided from its "central storage" (i.e., local memory) to render the view and display it on a display unit 5 (or on the display of node 3). *Id.* If the data blocks provided from the local memory of node 3 are not at the indicated resolution level, then node 3 will download additional data blocks from the remote server node 1. *Id.* (node 3 not directly connected to collector network). The remote server node 1 obtains data blocks from spatially distributed data sources via a collector network 6 and sends them to the client node 3. *Id.* Skyline asserts that the trackball and display are "remote" from the client node 3, and then characterizes node 3 as a "remote server" and the display unit 5/input

medium 10 as a client computer. Skyline Validity Mot. at 11-12. However, Figure 2 shows that both the trackball and the display are connected directly to node 3 (and nothing else) and the Mayer patent simply refers to this as a "supply network." Haight Decl., Ex. 51 ('897 patent at 6:64-7:7 & Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 96-97. At minimum, a person of ordinary skill in the art would also understand that the node 3 computer (an SGI Onyx in the preferred embodiment) would have its own display (regardless of whether it was also connected via the supply network to a display unit 5). *Id.* ¶ 97.

The disclosures in the SIGGRAPH '95 T_Vision Project materials show a similar set up to that described in Figure 2 of the Mayer patent:



Mewes Decl., Ex. 3 (PRESS.HTM at p.2) & Ex. 2 (TRACKER.mpeg). These materials also describe a remote database. *See, e.g., id.*, Ex. 3 (TERRABAS.HTM at p.2). This database was generated from spatially distributed data sources and, at the time of SIGGRAPH '95, included 10 GB of image and DEM data covering the whole world (with higher resolution data available for certain specific areas). *Id.* This data was downloaded and provided to a renderer for display. *Id.* (RENDERER at p. 1-2).

Skyline attempts to cast the T_Vision prior art references as "2D" systems. However,

Skyline does so by ignoring that the Mayer patent explicitly states that a "pictorial representation of space-related data" may be "based on a three-dimensional geometrical model." Haight Decl., Ex. 51 ('897 patent at col. 8:56-57). This patent also discloses that elevation data, as well as image data, is used for rendering certain pictorial representations: "In order to show the field of view with this image resolution a height value is required every 150 m and an image value of a surface every 15 m." *Id.* at col. 8:14-17. The Mayer patent also states that its methods can be used for representing topographical data, and refers to a "topographic grid network of the earth surface." *See, e.g., id.* at col. 1:7-10, 4:36-41 & 9:18-43. This is a grid representing elevation data (topography). Feiner Opp. Decl. ¶ 80. Skyline seizes on descriptions of this topographical grid network as "two-dimensional" to argue that the Mayer patent is not rendering three-dimensional terrain. However, this is simply a reference to how the data is stored (as a two-dimensional array), not a statement that the use of the topographical grid network results in the rendering of two-dimensional terrain. *Id.*

The T_Vision Project materials include disclosures that both elevation and image data was used to render three-dimensional terrain. These materials state that T_Vision provided a "virtual globe" that was "modeled from high resolution spatial data and textured with high resolution satellite images." Mewes Decl., Ex. 3 (TVISION.HTL at p.1). The "high resolution spatial data" is elevation data and it is "textured" or overlaid with "high resolution satellite images." Feiner Opp. Decl. ¶ 78. Moreover, these materials further clarify that both image data and elevation data were used to render the terrain: they describe a database with "pairs of index and data files containing 128x128 pixel texture images (surface, clouds) and 16x16 point elevation data." Mewes Decl., Ex. 3 (TERRABAS.HTM at p.1); *see also id.* ("Currently the source data consists of around 10 GB of image and DEM data…."). The videos included in

these materials also illustrate the rendering of three-dimensional terrain. *See* Mewes Decl., Ex. 2 (TERRA_S.mpeg & BERLIN.mpeg).

To counter these disclosures, Skyline resorts to misdirection. Skyline claims that the T_Vision Project materials state that "Geometry [*i.e.*, elevation] and Billboards [*i.e.*, vector data] are stored locally." *See* Skyline Validity Mot. at 13. The materials actually state: "The database basically consists of pairs of index and data files containing 128x128 pixel texture images (surface, clouds) *and 16x16 point elevation data*. Geometry and Billboards are not stored at other places in the current implementation, but this will change in the future." *See* Mewes Decl., Ex. 3 (TERRABAS at p. 1) (emphasis added). In context, it is clear that "geometry" does not refer to "elevation data" (which is contained in the database), but rather to other "geometry" data such as the CAD models of buildings. Feiner Opp. Decl. ¶ 101. Moreover, "other places" does not necessarily mean "locally." *See id.* The CAD building models and billboards were not obtained from spatially distributed data sources, but could be stored on the remote server. *Id.* In other words, Skylines points to nothing at all indicating that T_Vision failed to implement a remote, 3D visualization system.

Finally, Skyline tries to tear down the T_Vision Project materials as a "mere concept" despite the fact that the very same document describes "The (already existing and working) Prototype." *See* Mewes Decl., Ex. 3 (RENDERER.HTM at p. 1).[5] Skyline also carefully prunes its quotations to imply that the inventors of T_Vision wanted to "throw away all the code."

[5] There is no requirement that a printed publication have a working prototype to anticipate. *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003) ("Anticipation does not require the actual creation or reduction to practice of the prior art subject matter; anticipation requires only an enabling disclosure."), *citing In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985) (finding it is not necessary that a product disclosed in a printed publication actually be made in order to establish that the publication constitutes an anticipation under 102(b)).

Skyline Validity Mot. at 13. The actual quotation makes clear that this was not the code for the renderer, but rather the code for the database: in the file "T_Vision Database" it states "One of the first things I will do is to throw away all the code I have written for *this* prototype and replace it with a real object oriented full feature *distributed high performance real time database.*" Mewes Decl., Ex. 3 (TERRABAS.HTM at p.3 (emphasis added)). In any case, this quotation confirms that T_Vision did have a working database—the developers just wanted to build a better one. Feiner Opp. Decl. ¶¶ 74-75.

Last, but not least, Skyline claims that the "Task" defined in the T_Vision Project materials of developing a database that utilizes geometry and textures in real time is "exactly what Skyline's Ronnie Yaron and Ofer Shor, (unlike TerraVision and T_Vision) undertook and solved." Skyline Validity Mot. at 13. Since the "Task" is the same, "The (already existing and working) Prototype" for T_Vision and descriptions of it anticipate claims 1 and 12. *See* Mewes Decl., Ex. 3 (RENDERER at pp. 1-2).

B. At a Minimum, There Is a Genuine Issue of Material Fact as to Whether the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application Anticipate Claims 1 and 12

1. *The Parties Dispute the Public Use of T_Vision at SIGGRAPH '95*

Skyline disputes that T_Vision was publicly demonstrated at SIGGRAPH '95, but such public use is corroborated by the publication of materials about the T_Vision Project from SIGGRAPH '95, and also by the testimony of Stephen Lau and Dr. Feiner. Mewes Decl., Ex. 2, Ex. 6 (Lau Depo at 44:20-47:25, 84:5-16, 202:12-205:12) & Ex. 7 (Feiner Depo at 45:11-52:6). Further evidence of what was demonstrated at SIGGRAPH '95 is found in the Terra1995 video describing T_Vision and in the Mayer patent (the corresponding German application was filed just a few months later in December 1995). Mewes Decl., Exs. 4 (Terra1995 video); Haight Decl., Ex. 51 ('897 patent); *see also* Feiner Opp. Decl. ¶ 73.

Skyline also again makes the baseless claim that Dr. Feiner's testimony is founded only on his personal observation of T_Vision at SIGGRAPH '95. Skyline Validity Mot. at 27-28. In fact, to the contrary, this testimony rests on Dr. Feiner's analysis of all the relevant evidence, not just his personal observations of an interactive demonstration of the T_Vision application at SIGGRAPH '95. Feiner Opp. Decl. ¶ 73.

It is clear from the very disclosures Skyline cites that the T_Vision application was more than a "mere concept." It was a working prototype with a functioning remote database. Mewes Decl., Ex. 3 (RENDERER.HTM & TERRABAS.HTM). There is nothing to indicate that the developers of T_Vision failed in any material way to implement the task of developing a renderer which visualizes a worldwide distributed database with unlimited geometry and textures in realtime. *See id.* The working prototype data base was more limited (covering 10 GB of image and DEM data over the whole world), but there is no 10 GB claim limitation in the '189 patent. *Id.*

Finally, whether or not the T_Vision application was publicly used has no import on the prior art status of either the Mayer patent or of the T_Vision Project material published in connection with SIGGRAPH '95.

2. *Under Skyline's View of the Court's Claim Construction, the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application Anticipate Claims 1 and 12*

Skyline asserts that none of the T_Vision references disclose the three functions of a "renderer" as construed by the Court. Skyline Validity Mot. at 29. It cites Dr. Feiner's testimony and argues that under the "proper" construction of the term renderer, Dr. Feiner cannot identify specific objects that are the renderer and not the renderer in T_Vision. However, under Skyline's loose interpretation of the term "renderer" (which does not require the identification of objects that are and are not the renderer and which also allows a single function to server as both

renderer and other object), it is not necessary to identify objects that are the renderer and objects that are not. *See* Google's Opp. to Skyline Infringement Mot. at 5-7. If this interpretation is followed, then there is at least a dispute of fact as to whether each of the T_Vision references discloses a renderer. *See* Feiner Opp. Decl. ¶¶ 82-85, 91-92, 95-97.

Skyline further claims that the T_Vision references did not disclose a "communication link" and a "processor," but this theory is based on Skyline's distorted view of the disclosures in the Mayer patent. Skyline Validity Mot. at 30. As shown in Figure 2, the "processor" is the processor of node 3. Haight Decl., Ex. 51 ('897 patent at Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 85, 92, 95-97, 103-104. The "communication link" is the interchange network 7. *Id.* Moreover, node 3 also has a "central storage" which is the local memory of that machine. *Id.* In the Mayer patent, a "first data set" with coarse spatial resolution is called up and then "centrally stored" (becoming the "first data block from a local memory" at node 3). Haight Decl., Ex. 51 ('897 patent at col. 2:11-17); Feiner Opp. Decl. ¶ 95. The patent further states that "[a]fter each transmission and central storage of data, an image representation results, even if the data are insufficient to make possible the desired image resolution. As a result, even if the method is interrupted due to an alteration of the field of view and newly begun for a new field of view, the data for an image, even at low resolution, are always available." Haight Decl., Ex. 51 ('897 patent at col. 3:27-33).

Accordingly, at a minimum, there are genuine issues of material fact as to whether the Mayer patent, the T_Vision Project materials or the public use of the T_Vision application anticipate claims 1 and 12.

C. The Combination of the T-Vision Prior Art and the Knowledge of One of Ordinary Skill in the Art Renders Claims 1 and 12 Obvious

As detailed above there are at least genuine disputes of fact regarding the scope and

content of the T_Vision prior art. *See, supra*, Parts III.A & III.B. There are also genuine disputes of fact regarding the level of ordinary skill in the art to the extent that Skyline contends that any of these references are not enabling. Google also disputes the only alleged secondary consideration relied on by Skyline (failure of others)—the evidence shows that the developers of T_Vision *succeeded* in downloading image and elevation data in the manner claimed in the '189 patent (and Skyline at least appears to concede that they *succeeded* in downloading image data). Thus, again, on all four factual underpinnings of the obviousness inquiry, there are genuine disputes of material fact, and summary judgment should be denied. *See, e.g.*, *Medical Instrumentation*, 344 F.3d at 1221-22.

There can be no real dispute that a person of ordinary skill in the art would have been motivated to combine the T_Vision application with the SIGGRAPH '95 T_Vision Project materials and with the Migdal patent. Feiner Opp. Decl. ¶¶ 105-106. This is not "impermissible hindsight." These references all refer to the same project and system. *Id.* ¶ 106.

In its motion, Skyline simply re-argues variants of the same issues already addressed above. It again advances its disputed interpretation of the Mayer patent as not having a client-server system, and argues under various theories that this does not satisfy the claims. Skyline Validity Mot. at 31-33, 35-36. Next, it asserts that the T_Vision references do not download elevation data (or that they are two-dimensional systems). *See id*. at 33-35. For the same reasons addressed above, these arguments should be rejected.

First, the T_Vision prior art references employed a system with a local memory and first data block as claimed by the '189 patent. This is the same argument Skyline raises above with the same result—the parties at a minimum dispute whether the node 3 computer is a "client" computer with a communications link to the node 1 "remote server" (Skyline asserts that the

"input" and the "display" are really the client computer and are remote from the node 3 computer). Haight Decl., Ex. 51 ('897 patent at col. 2:11-17, 3:27-33 & Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 96-97. Moreover, Skyline ignores disclosures in the Mayer patent showing that client node 3 has only one display unit connected via the supply network, not a "plurality of displays," and that, in any case, a person of ordinary skill in the art would understand that node 3 has its own display. Haight Decl., Ex. 51 ('897 patent at col. 6:19-21 & Fig. 1); Feiner Opp. Decl. ¶ 97. Also, Dr. Feiner is not relying on "hindsight" to "perceive" a display in Figure 2 of the Mayer patent—it is right there in the figure. *Id.* at Fig. 2.

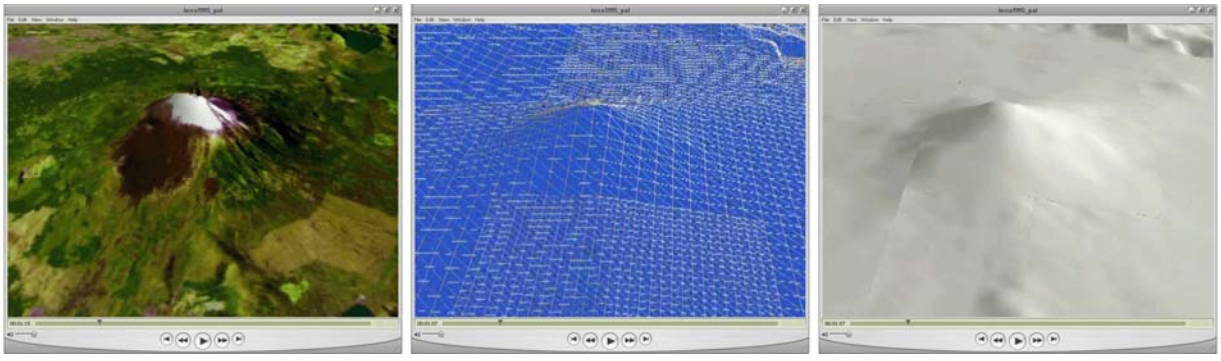
The T_Vision prior art references also disclosed the step of "receiving from the renderer" at least to the extent that the Court's construction of that term (and limitation) have been loosely interpreted by Skyline in its infringement motion. Skyline Validity Mot. at 35-36. As to this limitation, Skyline misstates Google's contentions. Google does not argue that the "GAI system" satisfies this limitation. A GAI or "address" simply identifies the location and resolution level of a data block (whether internally or externally). Haight Decl., Ex. 51 ('897 patent at col. 8:28-42 (discussing how sections are addressed in the quadrant tree)); *see also* Feiner Opp. Decl. ¶¶ 83-84. Google does not argue that the input device in the Mayer patent is the "renderer." The input device allows the user to navigate the terrain, not to perform the rendering functions recited of the '189 patent. Haight Decl., Ex. 51 ('897 patent at col. 7:3-9). The "renderer" in the Mayer patent is part of the node 3 computer, not part of the input medium or the display device. Feiner Opp. Decl. ¶¶ 96-97. The node 3 computer also is not the "remote server." *Id.* ¶ 97. In any event, Skyline's unfounded assumptions about Google's theories amount essentially to disputes of fact over the content of the prior art, and cannot provide a basis for summary judgment.

Finally, the T_Vision prior art references also disclosed a "processor" and a "communications" link as addressed above.

Second, the T_Vision prior art references further disclosed the remote, interactive streaming of 3D elevation data. As discussed above, there is clear and convincing evidence that all three T_Vision references disclosed the rendering of three-dimensional terrain using image data and elevation data (at least among other embodiments). *See, e.g.*, Haight Decl., Ex. 51 ('897 patent at Abstract, col. 1:7-10, 4:36-41, 8:14-17, 8:56-57, & 9:18-43); Mewes Decl., Ex. 3 (TVISION.HTL at p.1 & TERRABAS.HTM at p.1), Ex. 2 (TERRA_S.mpeg & BERLIN.mpeg). It is also clear that the T_Vision application rendered three-dimensional terrain:

> By switching the surface off, we can observe this process more easily. As the distance between us and the Earth increases, the high resolution data is removed from the memory and is replaced with new data for the wider field of view. Out of these different levels of altitude data, we compute the tectonic surface of the Earth and then project the corresponding satellite images onto it. An asynchronous and anticipatory loading strategy always guarantees a steady frames per second.

Mewes Decl., Exs. 4 (Terra1995 video) & 5 (transcript of video). In addition to the regular textured view, this portion of the Terra1995 video shows both wireframe and shaded, untextured views of the terrain that clearly indicate that it was rendered from a 3D model whose elevation varies across the terrain:



Further, in these T_Vision references, both image data and elevation data were

downloaded in the same manner as the '189 patent. *See* Feiner Opp. Decl. ¶¶ 99-104. The T_Vision Project materials describe the application as a "real-time rendering system," where remote data was "integrated unobtrusively into the user's system on the fly." Mewes Decl., Ex. 3 (TVISION.HTL at pp. 1, 2). It displayed a coarse view if you moved too fast, since it had to download additional, higher resolution data blocks in order to display the view at the requested resolution level. *Id.* (RENDERER.HTM at p. 1). The T_Vision Project materials also disclose that remotely stored data was accessed via NFS on an ATM-network. *Id.*, Ex. 3 (TERRABAS.HTM at p. 2); Feiner Opp. Decl. ¶ 102. Google certainly has not "admitted" that T_Vision never streamed elevation data as needed.

The Mayer patent also disclosed downloading additional, higher resolution data blocks in real-time as needed by the user. For example, the patent teaches:

> If the resolution of the representation is below the desired image resolution, the field of view is divided into sections and an investigation is undertaken for each individual section to see whether the data within the section are sufficient for a representation with the desired image resolution. If this is not the case for one of the sections, *further data with a finer resolution are called up*, transmitted and centrally stored from at least one of the spatially distributed data sources, and the section is shown with the new data. In turn an investigation is carried out into sufficient image resolution and possibly a further sub-division of the tested section is carried out into further partial sections as described above.

Haight Decl., Ex. 51 ('897 patent at col. 2:17-29); *see also id.* at col. 7:45-59. As with the T_Vision Project materials, there is nothing to indicate that elevation data was treated any differently than image data. Feiner Opp. Decl. ¶¶ 103-104.

To the extent that any one of these references lacked enabling disclosures, a person of ordinary skill in the art would have been motivated to combine them. *Id.* ¶ 106. The parties dispute whether these references were enabling either individually or as a combination. *Id.* ¶¶ 105-106. To bolster its enablement case, Skyline again improperly tries to build into this inquiry allegedly complex methods of "utilizing" the provided data blocks. Skyline Validity Motion at

34. These methods are not covered by the '189 patent. '189 patent, claims 1 and 12.

Finally, the T_Vision Project materials at SIGGRAPH '95 did not just identify a problem to be solved – these materials identified "The (already existing and working Prototype)" which solved that problem. Mewes Decl., Ex. 3 (RENDERER.HTM at p.1).

IV. THE MIGDAL AND COSMAN PRIOR ART INVALIDATES CLAIMS 1 AND 12

The combination of the Migdal patent and the Cosman article provides still another ground for denying Skyline's motion for summary judgment of validity. As detailed below, Skyline again ignores the numerous factual disputes precluding summary judgment, including disputes over the scope and content of this prior art, over differences between it and the claimed invention, and over the level of ordinary skill in the art. *See, e.g., Medical Instrumentation*, 344 F.3d at 1221-22. Moreover, while insisting that the Examiner of the '189 patent be given the greatest possible deference, Skyline apparently forgets that this same Examiner found that Migdal lacked only a single limitation of claims 1 and 12, a limitation explicitly found in the Cosman article.

The Migdal patent was filed on November 6, 1995, and issued on June 2, 1998. Haight Decl., Ex. 52. It describes a method and system for providing texture using a selected portion of a texture map. The Cosman article was presented at the IMAGE VII Conference in June 1994, and relates to global terrain texture. *Id.*, Ex. 28. These references are not "unrelated." Skyline Validity Mot. at 14. To the contrary, the Migdal patent specifically references the Cosman article as prior art, and given this express suggestion, a person of ordinary skill in the art would thus have been motivated to combine these references. *See id.*, Ex. 52 ('783 patent at References Cited); Feiner Opp. Decl. ¶¶ 113-114.

The Migdal patent is clearly relevant art as it was cited as prior art to the '189 patent. *See* '189 patent at References Cited. In fact, during prosecution of the '189 patent, the Examiner

repeatedly rejected the claims of the '189 patent as either anticipated, or obvious, in light of Migdal. Chang Decl., Ex. 2 at GOOG 103-15, GOOG 130-38. The Examiner did eventually allow claims 1 and 12 over Migdal. *Id.* (application claim 3 corresponds to claim 1 of the '189 patent, and application claim 33 corresponds to claim 12). Accordingly, Google agrees that there is a presumption that the Patent Office properly did its job and that Migdal, *by itself*, does not anticipate or render obvious these claims.

Cosman was not cited as prior art to the '189 patent, and was not considered by the Examiner during prosecution of the '189 patent. *See* '189 patent at References Cited. There is also no evidence that the Examiner ever considered whether the *combination* of the Migdal patent and the Cosman article rendered obvious claims 1 and 12. Thus, this prior art combination was never before the Patent Office during prosecution, and there is no "especially difficult" burden in demonstrating obviousness in light of the combination of Migdal and Cosman. *SIBIA Neuurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1355-56 (Fed. Cir. 2000) ("alleged infringer's burden may be more easily carried because of this additional reference" not considered by the Examiner).

If we assume that the Patent Office did its job, Skyline must then agree (as reflected in the prosecution history) that Migdal is a "system and method for computer modeling of 3D objects," and that it discloses:

> [A] method of providing data blocks (LOD generation block 1050, FIG. 10), describing three-dimensional terrain to a renderer (raster subsystem 224, FIG. 2), the data blocks belonging to a hierarchical structure which includes blocks at a plurality of different resolution levels (col. 9, ll.5-17), the method comprising:
>
> - receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level (col.16, ll.1-21);
> - providing the renderer with a first data block which includes data corresponding to the one or more coordinates from a local memory (col.9, ll.5-14);

- downloading from a remote server one or more additional data blocks which include data corresponding to the one or more coordinates if the provided block from the local memory is not at the indicated resolution level (col.8, l.66-col.9, l.36 and FIG. 2. Local memory: texture memory 226. Remote server: [mass storage device, col. 6, ll. 55-57]).

Chang Decl., Ex. 2 at GOOG 105, GOOG 131-32 & GOOG 137; *see also* Feiner Opp. Decl. ¶¶ 115-130 (identifying relevant disclosures in Migdal and Cosman on an element-by-element basis). The only element of claims 1 and 12 that the Examiner found missing from Migdal was "downloading a block at a resolution level higher than the resolution level of the first data block" (i.e., Migdal disclosed providing the data block with the highest resolution first). *Id.* at GOOG 108-09 & GOOG 134.

In response to these rejections, Skyline never argued that Migdal was "an image system" or that "there was no disclosure of any real use of elevation data." *See, e.g., id.* at GOOG 117-19 & GOOG 151-54. It also never argued that Midgal "utilized only local memory or storage." *Id.* In fact, Skyline admitted that "Migdal discloses how the processor creates the initial data blocks (clip maps) from the larger terrain image (texture map) and subsequent storage of those data blocks (clip maps) in local memory." *Id.* at GOOG 152. Instead, Skyline simply argued that the Examiner should allow claims 1 and 12 as it would not have been obvious from Migdal to reverse the download order, i.e, to download lower resolution tiles before higher resolution tiles. *Id.* at GOOG 152-53.

While ignoring the prosecution history, Skyline further avoids analysis of the actual disclosures in the Migdal patent by pointing to the testimony of Michael T. Jones (one of the named inventors on the Migdal patent and a Google employee). Skyline Validity Mot. at 14-15, 37-38. In this testimony, Mr. Jones makes absolutely clear that he did not perform an invalidity analysis or reach a definite opinion regarding whether Migdal or Cosman invalidates the claims

of the '189 patent. *See, e.g.*, Haight Decl., Ex. 44 (Jones Depo. at 57 ("I don't have any way to know whether the method aspect of this patent has legal stature to invalidate the similar in some ways methods in the '189 patent.")).[6] Mr. Jones did state that Migdal was directed to "an image system." However, Skyline glosses over disclosures in Migdal teaching that "[t]wo-dimensional or three dimensional texture data can be used," and that "[a] large amount of texture source data … is stored as a two dimensional *or three-dimensional* texture MIP-map." *See, e.g.*, Haight Decl., Ex. 52 ('783 patent at Abstract & col. 3:18-19). Indeed, Migdal expressly states that "[a]lthough the present invention is described herein with respect to two-dimensional texture mapping, the present invention can be extended to three-dimensional texture mapping when the requisite additional software and/or hardware resources are added." *Id.* at col. 6:9-19 (incorporating by reference U.S. Patent No. 5,490,240 directed to "A System and Method of Generating Interactive Computer Graphic Images Incorporating Three Dimensional Textures"). A person of ordinary skill in the art would understand from these disclosures that *either* two-dimensional or *three-dimensional* data could be used in Migdal. Feiner Opp. Decl. ¶ 116.

Skyline next argues that Migdal did not have a remote server. The parties agree that the preferred embodiment in Migdal disclosed a "mass storage device" for storing the hierarchical database. *See, e.g.*, Haight Decl., Ex. 52 ('783 patent at col. 6, ll. 55-57 & Fig. 2). This mass storage could be local, but Migdal also recognized that it could be remote: "Under conventional texture mapping techniques, even if texture data were to be accessed from a remote, large texture MIP-map, the rendering of a textured image for display in real-time would be impractical, if not impossible. The present invention, however, realizes the advantages of accommodating large texture MIP-maps in one or more mass storage devices 208 without reducing texture across

[6] While Skyline appears willing to accept Mr. Jones' testimony on issues of validity, they ignore his testimony that Google Earth does not infringe. *See, e.g.*, Mewes Decl., Ex. 8 (Jones Depo at 44:23-45:10, 65:12-66:21).

time." *Id.* at col. 7:51-58; *see also* col. 7:59-8:4. Furthermore, a person of ordinary skill in the art would understand that mass storage devices such as those described in Migdal could be local or remote. Feiner Opp. Decl. ¶ 126.

Cosman is not mere "makeweight." Cosman discloses the very limitation which the Examiner said was missing in Migdal: "downloading a block at a resolution level higher than the resolution level of the first data block." In contrast to Migdal, Cosman includes an explicit suggestion to implement "[p]referential paging of the lower LODs." Haight Decl., Ex. 28 at 62. Thus, Cosman teaches that tiles should be downloaded in coarse-to-fine resolution order. Feiner Opp. Decl. ¶ 127. In its motion, Skyline asserts that Google is relying on the same disclosures in Migdal and Cosman. This assertion is made without any basis. Dr. Feiner's expert report is very clear that Migdal disclosed every limitation of claims 1 and 12 except the download order, and Cosman supplied the explicit suggestion to download tiles in coarse-to-fine resolution order. Feiner SJ Decl, Ex. D at ¶¶ 172-182. During prosecution, the Examiner relied on an argument that it would have been obvious to reverse the download order in Migdal and did not point to any prior art reference (such as Cosman) that explicitly made this suggestion. Chang Decl., Ex. 2 at GOOG 108-09 & GOOG 134. The combination of Migdal and Cosman was thus never considered, but at least raises a genuine dispute of material fact precluding summary judgment of validity.

V. CONCLUSION

For the foregoing reasons, Google respectfully requests that the Court deny Skyline's motion for summary judgment of validity.

Dated: February 2, 2007

Respectfully submitted,

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Certificate of Service

I hereby certify that, on February 2, 2007, I caused a true and accurate copy of the foregoing document to be served upon all counsel of record for each party by complying with this Court's Administrative Procedures for Electronic Case Filing.

By: /s/ Darryl M. Woo
Darryl M. Woo