

UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLUMBIA

**IN RE PAPST LICENSING GMBH & CO.  
KG LITIGATION**

**This Document Relates To:  
ALL CASES**

**Misc. Action No. 07-493 (RMC)  
MDL Docket No. 1880**

**PAPST’S MEMORANDUM IN SUPPORT OF EXPERT TESTIMONY IN THE  
COURT’S CLAIM INTERPRETATION PROCESS**

Pursuant to the Court’s Third Practice and Procedure Order dated June 6, 2008, Papst Licensing GmbH & Co. KG (“Papst”) submits the following memorandum in support of its request for expert testimony to be part of the claim interpretation process.

**I. INTRODUCTION**

When the meaning of a patent claim term is readily apparent from the intrinsic evidence consisting of the patent itself and the prosecution history, the patent claim should be so construed. However, if the meaning of a claim term is not clear, a court may look to the extrinsic evidence to help resolve that lack of clarity. Furthermore, even if a claim term is not ambiguous, it is appropriate—and preferable—for a court to consult trustworthy extrinsic evidence to ensure that its claim construction is not inconsistent with the widely held understandings in the pertinent technical field. Specifically, expert testimony is helpful to the Court in the claim interpretation process for the purposes of providing background on the technology at issue, explaining how an invention works, ensuring that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, establishing that a particular term in the patent or

the prior art has a particular meaning in the pertinent field, and helping the trial court understand the patent process itself. As one team of legal scholars has aptly observed, “[e]ven the most experienced intellectual property practitioners cannot simply read a patent and file history and divine the correct meaning of claim terms; they too require and seek [extrinsic] information about the relevant technology.” Anita K. Lee and William F. Krug, *Still Adjusting to Markman: A Prescription for the Timing of Claim Construction Hearings*, 13 HARV. J. LAW & TECH. 55, 64 (Fall 1999).

## II. **ARGUMENT**

### A. **EXPERT TESTIMONY SHOULD BE CONSIDERED DURING THE CLAIMS CONSTRUCTION PROCESS BECAUSE IT ASSISTS THE TRIAL COURT IN REACHING THE CORRECT CLAIM CONSTRUCTION**

The Court of Appeals for the Federal Circuit consistently has held that expert testimony should be used in the claim interpretation process. *Phillips*, 415 F.3d at 1318; *Pitney Bowes v. Hewlett-Packard Co.*, 182 F.3d 1298, 1314 (Fed. Cir. 1999) (claim construction at the trial court level benefits from expert testimony that supplies a proper technological context to understand the claims, explains the meaning of claim terms as understood by one of ordinary skill in the art, and helps the trial court understand the patent process); *Tanabe Seiyaku Co., Ltd. v. U.S. Trade Commission*, 109 F.3d 726, 732 (Fed. Cir. 1997) (holding that expert testimony about how those skilled in the art would interpret certain language in the claim assists the court in proper construction of the claim).

In *Phillips*, the court identified several significant roles of expert testimony during claims construction, “such as to provide background on the technology at issue, to explain how an invention works, to ensure that the court’s understanding of the technical

aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Phillips*, 415 F.3d at 1318. All of these important purposes would be served by admission of expert testimony in this case.<sup>1</sup> Because expert testimony will serve and aid the Court in achieving all of the above purposes, Papst respectfully requests that the parties be granted leave to submit expert declarations and testimony during the claim interpretation process, and to depose any experts the opposing parties intend to use at the *Markman* hearing.

**1. Because this is “a very complicated case” involving complex technology, expert testimony will assist the Court and the parties by explaining how the at-issue inventions work.**

The at-issue inventions generally relate to the transfer of data and in particular to interface devices for communications between a computer or host device and a data transmit/receive device from which data is to be acquired or with which two-way communication is to take place. Papst asserts the Camera Manufacturers have infringed 8 patent claims from the ‘399 patent, and 12 patent claims from the ‘449 patent. [Docket # 110, p. 78.] For example, claim 1 of the ‘449 patent claims the following invention:

1. An interface device for communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device comprising the following features:

a processor;

a memory;

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<sup>1</sup> Although a trial court should not consider expert testimony that injects a new meaning into terms or that is inconsistent with what the inventor set forth in his patent and communicated to the patent examiner, Papst does not intend to offer expert testimony for that purpose. See *Vitrionics v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996).

a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and  
 a second connecting device for interfacing the interface device with the data transmit/receive device,

wherein the interface device is configured by the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device,

whereupon the host device communicates with the interface device by means of the driver for the storage device customary in a host device, and wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a directory structure.

(U.S. Patent No. 6,470,449, claim 1) (Ex. A.). The above claim language is not readily interpreted by a lay person. The remaining at-issue patent claims are no less complex. *See* Ex. A. Indeed, Casio's own counsel has conceded that this is a "very complicated case." (May 31, 2002 Tr., p. 7) ("But stepping back and just looking at where we are now, and we've got six more months of fact discovery, it's a very complicated case, even liability-wise.").

Many of the claim terms have particular meanings in the pertinent field. For example, terms in the patent claims such as "driver," and "interface" may mean one thing to a lay person, and something entirely different to a person having ordinary skill in the art who has read the patents- in-suit. While it may be readily apparent to lay persons that the term "driver," as it is used in the patent claims, means something other than a person who operates an automobile, a lay person may not necessarily have a full understanding as to what a "driver" is in the context of the present invention. A technical expert would be able to provide the background of what a person of ordinary skill in the art would

understand the term to mean, and assist the Court in reaching an appropriate claim construction. In another example, Papst contends that “virtual files” mean files that appear to be present on a simulated disk drive, but are not on rotating media. [Docket # 110, p. 78.] Casio contends that “virtual file system” is a file system that is not real, but instead simulates a hard disk file system. (Ex. B, p. 16.)(Casio’s Second Supplemental Objections and Responses to Papst Interrogatory No. 1.) Casio further asserts in its own claim interpretations that at least one of the patent claim terms is “vague.” (Ex. B, p. 8) (“The term ‘customary’ in the context of the ‘399 and ‘449 patents is vague . . .”).

Expert testimony will educate the Court on the meaning of these disputed technical claim terms. Because briefs can explain only so much, having the ability to question experts in the relevant technical area will be invaluable for the court at the *Markman* hearing. It will also be helpful for expert witnesses to provide a background and context for the technology at issue. *See Phillips*, 415 F.3d at 1318. For example, an expert could explain how the alleged prior art existing before the at-issue inventions incorporated certain methods of connecting digital cameras and other interface devices to personal computers that typically required the loading of a specific software driver on the PC. In contrast to this alleged prior art, the expert could explain how the at-issue inventions have no such requirements.

Given that most of the claim language of these patents is outside the scope of a layperson’s knowledge and often has a particular meaning in the pertinent field, expert testimony clearly will be helpful to the Court in its claim interpretation task.

**2. Expert testimony will be highly useful in this case to ensure that the Court's understanding of the technical aspects of the patent is consistent with that of a person of ordinary skill in the art.**

Pursuant to *Markman v. Westview Instruments*, this Court must determine the meaning of claim terms in accordance with how one of ordinary skill in the art would understand the claim term at the time of the invention. *Phillips*, 415 F.3d at 1312. The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation. *Phillips*, 415 F.3d at 1313. That starting point is based on the well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read and understood by others of skill in the pertinent art. *Phillips*, 415 F.3d at 1313. Only by viewing the claim terms through the eyes of one with ordinary skill in the art should this Court render proper claim interpretations. *Ferguson Beauregard/Logic Controls v. Mega Sys., LLC*, 350 F.3d 1327, 1338 (Fed. Cir. 2003) (claim terms “are examined through the viewing glass of a person skilled in the art”).

In some cases, the ordinary meaning of claim language as understood by a person of ordinary skill in the art may be readily apparent to lay judges. Often, however, “the ordinary and customary meaning of the claim requires examination of terms that have particular meaning in a field of art.” *Phillips*, 415 F.3d at 1314. Because the meaning of a claim term as understood by persons of skill in the art is often not readily apparent, and because patentees frequently use terms idiosyncratically, courts look to those sources available to the public that show what a person of skill in the art would have understood the disputed claim language to mean. *Id.* Those sources include intrinsic evidence (such as the words of the claim itself, the remainder of the specification, and the prosecution

history) and extrinsic evidence (such as expert testimony concerning the relevant scientific principles, the meaning of technical terms, and the state of the art). *Id.*

In this case, Papst has defined one of ordinary skill in the art as follows:

A person having ordinary skill in this field would have practical experience sufficient to provide an understanding of communications protocols between computers and computer peripheral devices, and the ability to read and understand specifications relating to such communications and protocols. A person having ordinary skill in this field would also have basic computer programming skills. A typical educational background would include an undergraduate degree in electrical engineering and/or computer sciences. However, as evidenced by Mr. Tasler's educational background (including degrees in physics), an undergraduate degree in electrical engineering and/or computer sciences is not absolutely necessary, as long as there is sufficient practical experience.

(Papst's Third Supplemental Answers to Casio's Interrogatories). Expert testimony will be useful in this case to ensure that this Court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art. *Aqua-Aerobic Systems, Inc. v. Aerators Inc.*, 211 F.3d 1241, 1245 (Fed. Cir. 2000) ("Expert testimony is often useful to clarify the patented technology and to explain its meaning through the eyes of experience . . . ."). Therefore, Papst respectfully requests that expert testimony be considered by this Court during the claim interpretation process.

### **III. CONCLUSION**

For the foregoing reasons, Papst respectfully requests that:

- (1) The parties be granted leave to submit expert declarations in support of their *Markman* briefs;
- (2) The parties be granted leave to depose any experts submitting declarations in support of their *Markman* briefs; and
- (3) The parties be granted leave to present expert testimony at this Court's *Markman* hearing.

Dated: June 16, 2008

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**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that a copy of the foregoing **PAPST'S MEMORANDUM IN SUPPORT OF EXPERT TESTIMONY IN THE COURT'S CLAIM INTERPRETATION PROCESS** was served on this 16<sup>th</sup> day of June, 2008 upon the attorneys for the Camera Manufacturers as follows:

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EXHIBIT A

(12) **United States Patent**  
**Tasler**

(10) **Patent No.:** **US 6,895,449 B2**  
(45) **Date of Patent:** **May 17, 2005**

(54) **FLEXIBLE INTERFACE FOR COMMUNICATION BETWEEN A HOST AND AN ANALOG I/O DEVICE CONNECTED TO THE INTERFACE REGARDLESS THE TYPE OF THE I/O DEVICE**

(75) Inventor: **Michael Tasler**, Wuerzburg (DE)

(73) Assignee: **Labortechnik Tasler GmbH**,  
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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 369 days.

(21) Appl. No.: **10/219,105**

(22) Filed: **Aug. 15, 2002**

(65) **Prior Publication Data**

US 2002/0199037 A1 Dec. 26, 2002

#### Related U.S. Application Data

(62) Division of application No. 09/331,002, filed on Jun. 14, 1999.

(30) **Foreign Application Priority Data**

Mar. 4, 1997 (DE) ..... 197 08 755  
Mar. 3, 1998 (EP) ..... PCT/EP98/01187

(51) Int. Cl.<sup>7</sup> ..... **G06F 13/14**

(52) U.S. Cl. .... **710/16; 710/8; 710/64; 709/220**

(58) Field of Search ..... **710/8, 16, 64, 710/11, 12, 15, 62, 63; 703/23, 24, 25; 709/220, 222**

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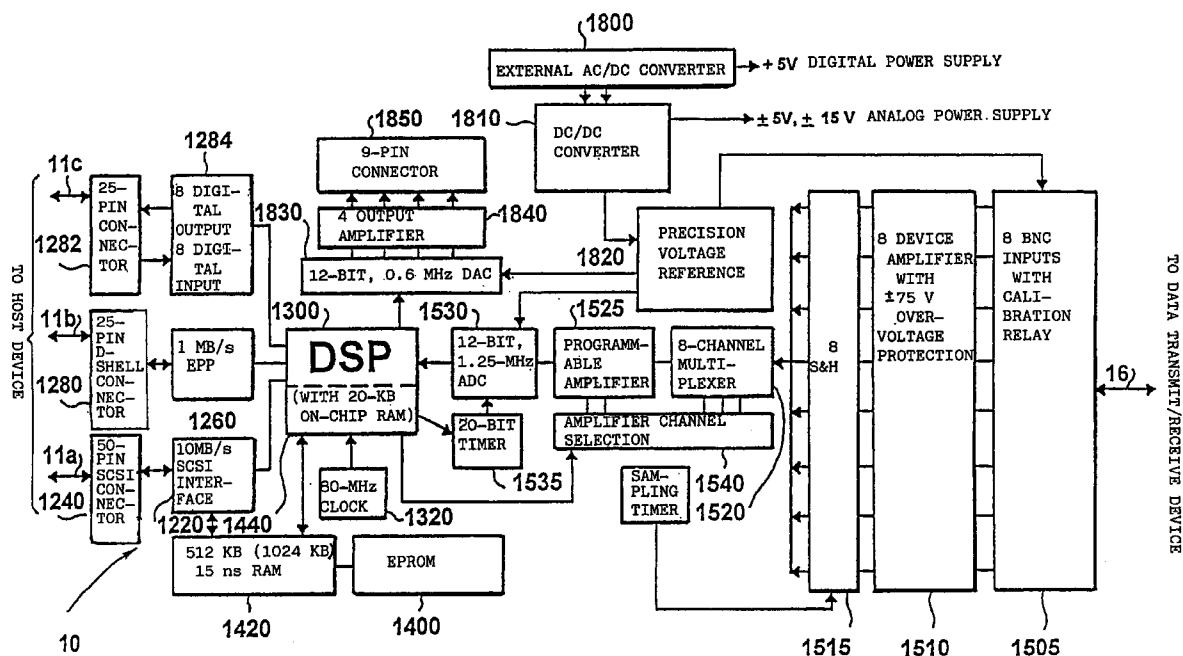
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Michael A. Glenn

(57) **ABSTRACT**

An interface device (10) provides fast data communication between a host device with input/output interfaces and a data transmit/receive device, wherein the interface device (10) comprises a processor means (13), a memory means (14), a first connecting device (12) for interfacing the host device with the interface device, and a second connecting device (15) for interfacing the interface device (10) with the data transmit/receive device. The interface device (10) is configured by the processor means (13) and the memory means (14) in such a way that, when receiving an inquiry from the host device via the first connecting device (12) as to the type of a device attached to the host device, regardless of the type of the data transmit/receive device, the interface device sends a signal to the host device via the first connecting device (12) which signals to the host device that it is communicating with an input/output device.

**18 Claims, 2 Drawing Sheets**



U.S. Patent

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Sheet 1 of 2

EXHIBIT A  
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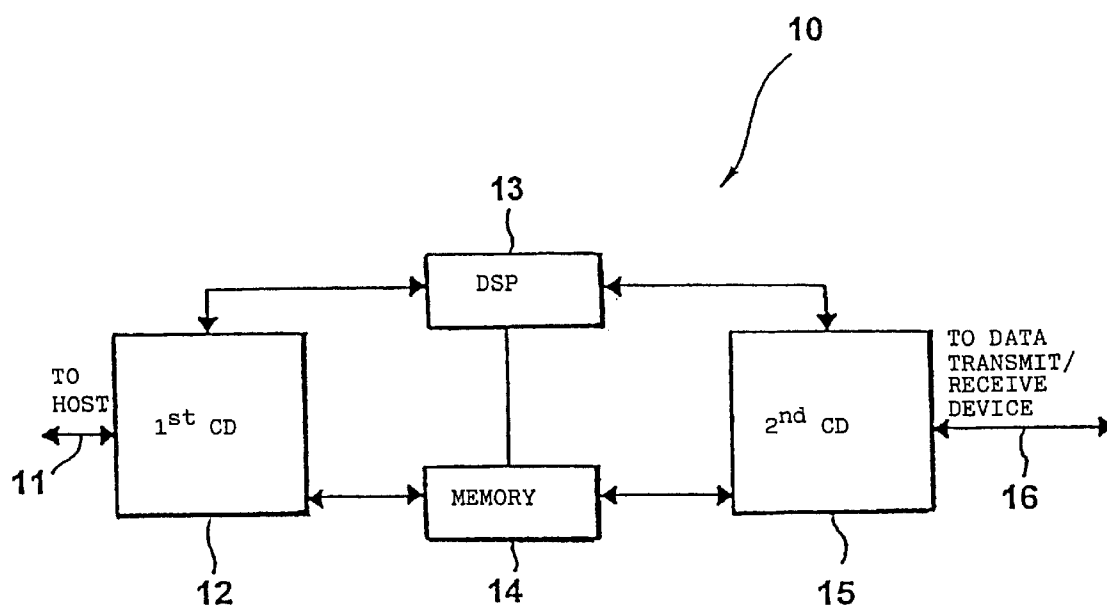


FIG. 1

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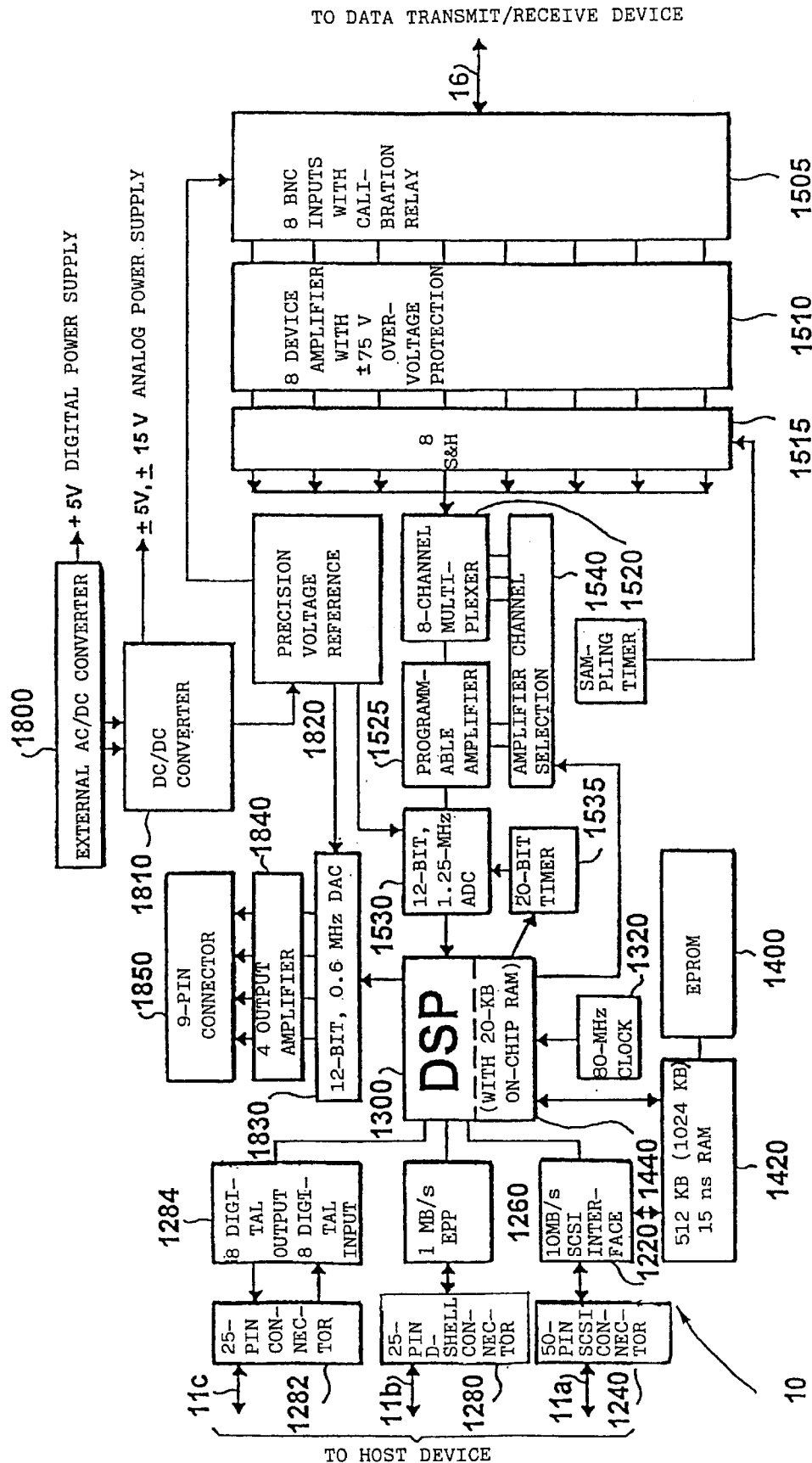
EXHIBIT A  
US 6,895,449 B2

FIG. 2

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**FLEXIBLE INTERFACE FOR  
COMMUNICATION BETWEEN A HOST AND  
AN ANALOG I/O DEVICE CONNECTED TO  
THE INTERFACE REGARDLESS THE TYPE  
OF THE I/O DEVICE**

**RELATED APPLICATIONS**

This application is a divisional application of copending application Ser. No. 09/331,002 filed Jun. 14, 1999.

**DESCRIPTION**

The present invention relates to the transfer of data and in particular to interface devices for communication between a computer or host device and a data transmit/receive device from which data is to be acquired or with which two-way communication is to take place.

Existing data acquisition systems for computers are very limited in their areas of application. Generally such systems can be classified into two groups.

In the first group host devices or computer systems are attached by means of an interface to a device whose data is to be acquired. The interfaces of this group are normally standard interfaces which, with specific driver software, can be used with a variety of host systems. An advantage of such interfaces is that they are largely independent of the host device. However, a disadvantage is that they generally require very sophisticated drivers which are prone to malfunction and which limit data transfer rates between the device connected to the interface and the host device and vice versa. Further, it is often very difficult to implement such interfaces for portable systems and they offer few possibilities for adaptation with the result that such systems offer little flexibility.

The devices from which data is to be acquired cover the entire electrical engineering spectrum. In a typical case, it is assumed that a customer who operates, for example, a diagnostic radiology system in a medical engineering environment reports a fault. A field service technician of the system manufacturer visits the customer and reads system log files generated by the diagnostic radiology system by means of a portable computer or laptop for example. If the fault cannot be localized or if the fault is intermittent, it will be necessary for the service technician to read not only an error log file but also data from current operation. It is apparent that in this case fast data transfer and rapid data analysis are necessary.

Another case requiring the use of an interface could be, for example, when an electronic measuring device, e.g. a multimeter, is attached to a computer system to transfer the data measured by the multimeter to the computer. Particularly when long-term measurements or large volumes of data are involved it is necessary for the interface to support a high data transfer rate.

From these randomly chosen examples it can be seen that an interface may be put to totally different uses. It is therefore desirable that an interface be sufficiently flexible to permit attachment of very different electrical or electronic systems to a host device by means of the interface. To prevent operator error, it is also desirable that a service technician is not required to operate different interfaces in different ways for different applications but that, if possible, a universal method of operating the interface be provided for a large number of applications.

To increase the data transfer rates across an interface, the route chosen in the second group of data acquisition systems

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for the interface devices was to specifically match the interface very closely to individual host systems or computer systems. The advantage of this solution is that high data transfer rates are possible. However, a disadvantage is that the drivers for the interfaces of the second group are very closely matched to a single host system with the result that they generally cannot be used with other host systems or their use is very ineffective. Further, such types of interface have the disadvantage that they must be installed inside the computer casing to achieve maximum data transfer rates as they access the internal host bus system. They are therefore generally not suitable for portable host systems in the form of laptops whose minimum possible size leaves little internal space to plug in an interface card.

A solution to this problem is offered by the interface devices of IOTech (business address: 25971 Cannon Road, Cleveland, Ohio 44146, USA) which are suitable for laptops such as the WaveBook/512 (registered trademark). The interface devices are connected by means of a plug-in card, approximately the size of a credit card, to the PCMCIA interface which is now a standard feature in laptops. The plug-in card converts the PCMCIA interface into an interface known in the art as IEEE 1284. The said plug-in card provides a special printer interface which is enhanced as regards the data transfer rate and delivers a data transfer rate of approximately 2 MBps as compared with a rate of approx. 1 MBps for known printer interfaces. The known interface device generally consists of a driver component, a digital signal processor, a buffer and a hardware module which terminates in a connector to which the device whose data is to be acquired is attached. The driver component is attached directly to the enhanced printer interface thus permitting the known interface device to establish a connection between a computer and the device whose data is to be acquired.

In order to work with the said interface, an interface-specific driver must be installed on the host device so that the host device can communicate with the digital signal processor of the interface card. As described above, the driver must be installed on the host device. If the driver is a driver developed specifically for the host device, a high data transfer rate is achieved but the driver cannot be easily installed on a different host system. However, if the driver is a general driver which is as flexible as possible and which can be used on many host devices, compromises must be accepted with regard to the data transfer rate.

Particularly in an application for multi-tasking systems in which several different tasks such as data acquisition, data display and editing are to be performed quasi-simultaneously, each task is normally assigned a certain priority by the host system. A driver supporting a special task requests the central processing system of the host device for processor resources in order to perform its task. Depending on the particular priority assignment method and on the driver implementation, a particular share of processor resources is assigned to a special task in particular time slots. Conflicts arise if one or more drivers are implemented in such a way that they have the highest priority by default, i.e. they are incompatible, as happens in practice in many applications. It may occur that both drivers are set to highest priority which, in the worst case, can result in a system crash.

EP 0685799 A1 discloses an interface by means of which several peripheral devices can be attached to a bus. An interface is connected between the bus of a host device and various peripheral devices. The interface comprises a finite state machine and several branches each of which is assigned to a peripheral device. Each branch comprises a

## EXHIBIT A

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data manager, cycle control, user logic and a buffer. This known interface device provides optimal matching between a host device and a specific peripheral device.

The specialist publication IBM Technical Disclosure Bulletin, Vol. 38, No. 05, page 245; "Communication Method between Devices through FDD Interface" discloses an interface which connects a host device to a peripheral device via a floppy disk drive interface. The interface consists in particular of an address generator, an MFM encoder/decoder, a serial/parallel adapter and a format signal generator. The interface makes it possible to attach not only a floppy disk drive but also a further peripheral device to the FDD host controller of a host device. The host device assumes that a floppy disk drive is always attached to its floppy disk drive controller and communication is initiated if the address is correct. However, this document contains no information as to how communication should be possible if the interface is connected to a multi-purpose interface instead of to a floppy disk drive controller.

It is the object of the present invention to provide an interface device for communication between a host device and a data transmit/receive device whose use is host device-independent and which delivers a high data transfer rate.

This object is achieved by an interface device according to claim 1 or 12 and by a method according to claim 15.

The present invention is based on the finding that both a high data transfer rate and host device-independent use can be achieved if a driver for an input/output device customary in a host device, normally present in most commercially available host devices, is utilized. Drivers for input/output devices customary in a host device which are found in practically all host devices are, for example, drivers for hard disks, for graphics devices or for printer devices. As however the hard disk interfaces in common host devices which can be, for example, IBM PCs, IBM-compatible PCs, Commodore PCs, Apple computers or even workstations, are the interfaces with the highest data transfer rate, the hard disk driver is utilized in the preferred embodiment of the interface device of the present invention. Drivers for other storage devices such as floppy disk drives, CD-ROM drives or tape drives could also be utilized in order to implement the interface device according to the present invention.

As described in the following, the interface device according to the present invention is to be attached to a host device by means of a multi-purpose interface of the host device which can be implemented, for example, as an SCSI interface or as an enhanced printer interface. Multi-purpose interfaces comprise both an interface card and specific driver software for the interface card. The driver software can be designed so that it can replace the BIOS driver routines. Communication between the host device and the devices attached to the multi-purpose interface then essentially takes place by means of the specific driver software for the multi-purpose interface and no longer primarily by means of BIOS routines of the host device. Recently however drivers for multi-purpose interfaces can also already be integrated in the BIOS system of the host device as, alongside classical input/output interfaces, multi-purpose interfaces are becoming increasingly common in host devices. It is of course also possible to use BIOS routines in parallel with the specific driver software for the multi-purpose interface, if this is desired.

The interface device according to the present invention comprises a processor means, a memory means, a first connecting device for interfacing the host device with the interface device, and a second connecting device for inter-

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facing the interface device with the data transmit/receive device. The interface device is configured by the processor means and the memory means in such a way that the interface device, when receiving an inquiry from the host device via the first connecting device as to the type of a device attached to the host device, sends a signal, regardless of the type of the data transmit/receive device, to the host device via the first connecting device which signals to the host device that it is communicating with an input/output device. The interface device according to the present invention therefore simulates, both in terms of hardware and software, the way in which a conventional input/output device functions, preferably that of a hard disk drive. As support for hard disks is implemented as standard in all commercially available host systems, the simulation of a hard disk, for example, can provide host device-independent use. The interface device according to the present invention therefore no longer communicates with the host device or computer by means of a specially designed driver but by means of a program which is present in the BIOS system (Basic Input/Output System) and is normally precisely matched to the specific computer system on which it is installed, or by means of a specific program for the multi-purpose interface. Consequently, the interface device according to the present invention combines the advantages of both groups. On the one hand, communication between the computer and the interface takes place by means of a host device-specific BIOS program or by means of a driver program which is matched to the multi-purpose interface and which could be regarded as a "device-specific driver". On the other hand, the BIOS program or a corresponding multi-purpose interface program which operates one of the common input/output interfaces in host systems is therefore present in all host systems so that the interface device according to the present invention is host device-independent.

In the following, preferred embodiments of the present invention will be explained in more detail with reference to the drawings enclosed, in which:

FIG. 1 shows a general block diagram of the interface device according to the present invention; and

FIG. 2 shows a detailed block diagram of an interface device according to a preferred embodiment of the present invention.

FIG. 1 shows a general block diagram of an interface device 10 according to the present invention. A first connecting device 12 of the interface device 10 can be attached to a host device (not shown) via a host line 11. The first connecting device is attached both to a digital signal processor 13 and to a memory means 14. The digital signal processor 13 and the memory means 14 are also attached to a second connecting device 15 by means of bi-directional communication lines (shown for all lines by means of two directional arrows). The second connecting device can be attached by means of an output line 16 to a data transmit/receive device which is to receive data from the host device or from which data is to be read, i.e. acquired, and transferred to the host device. The data transmit/receive device itself can also communicate actively with the host device via the first and second connecting device, as described in more detail in the following.

Communication between the host system or host device and the interface device is based on known standard access commands as supported by all known operating systems (e.g. DOS, Windows, Unix). Preferably, the interface device according to the present invention simulates a hard disk with

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a root directory whose entries are "virtual" files which can be created for the most varied functions. When the host device system with which the interface device according to the present invention is connected is booted and a data transmit/receive device is also attached to the interface device **10**, usual BIOS routines or multi-purpose interface programs issue an instruction, known by those skilled in the art as the INQUIRY instruction, to the input/output interfaces in the host device. The digital signal processor **13** receives this inquiry instruction via the first connecting device and generates a signal which is sent to the host device (not shown) again via the first connecting device **12** and the host line **11**. This signal indicates to the host device that, for example, a hard disk drive is attached at the interface to which the INQUIRY instruction was sent. Optionally, the host device can send an instruction, known by those skilled in the art as "Test Unit Ready", to the interface device to request more precise details regarding the queried device.

Regardless of which data transmit/receive device at the output line **16** is attached to the second connecting device, the digital signal processor **13** informs the host device that it is communicating with a hard disk drive. If the host device receives the response that a drive is present, it then sends a request to the interface device **10** to read the boot sequence which, on actual hard disks, normally resides on the first sectors of the disk. The digital signal processor **13**, whose operating system is stored in the memory means **14**, responds to this instruction by sending to the host device a virtual boot sequence which, in the case of actual drives, includes the drive type, the starting position and the length of the file allocation table (FAT), the number of sectors, etc., known to those skilled in the art. Once the host device has received this data, it assumes that the interface device **10** according to a preferred embodiment of the present invention is a hard disk drive. In reply to an instruction from the host device to display the directory of the "virtual" hard disk drive simulated by the interface device **10** with respect to the host device, the digital signal processor can respond to the host device in exactly the same way as a conventional hard disk would, namely by reading on request the file allocation table or FAT on a sector specified in the boot sequence, normally the first writable sector, and transferring it to the host device, and subsequently by transferring the directory structure of the virtual hard disk. Further, it is possible that the FAT is not read until immediately prior to reading or storing the data of the "virtual" hard disk and not already at initialization.

In a preferred embodiment of the present invention, the digital signal processor **13**, which need not necessarily be implemented as a digital signal processor but may be any other kind of microprocessor, comprises a first and a second command interpreter. The first command interpreter carries out the steps described above whilst the second command interpreter carries out the read/write assignment to specific functions. If the user now wishes to read data from the data transmit/receive device via the line **16**, the host device sends a command, for example "read file xy", to the interface device. As described above, the interface device appears to the host device as a hard disk. The second command interpreter of the digital signal processor now interprets the read command of the host processor as a data transfer command, by decoding whether "xy" denotes, for example, a "real-time input" file, a "configuration" file or an executable file, whereby the same begins to transfer data from the data transmit/receive device via the second connecting device to the first connecting device and via the line **11** to the host device.

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Preferably, the volume of data to be acquired by a data transmit/receive device is specified in a configuration file described in the following by the user specifying in the said configuration file that a measurement is to last, for example, five minutes. To the host device the "real-time input" file then appears as a file whose length corresponds to the anticipated volume of data in those five minutes. Those skilled in the art know that communication between a processor and a hard disk consists of the processor transferring to the hard disk the numbers of the blocks or clusters or sectors whose contents it wishes to read. By reference to the FAT the processor knows which information is contained in which block. In this case, communication between the host device and the interface device according to the present invention therefore consists of the very fast transfer of block numbers and preferably of block number ranges because a virtual "real-time input" file will not be fragmented. If the host device now wants to read the "real-time input" file, it transfers a range of block numbers to the interface device, whereupon data commences to be received via the second connecting device and data commences to be sent to the host device via the first connecting device.

In addition to the digital signal processor instruction memory, which comprises the operating system of the digital signal processor and can be implemented as an EPROM or EEPROM, the memory means **14** can have an additional buffer for purposes of synchronizing data transfer from the data transmit/receive device to the interface device **10** and data transfer from the interface device **10** to the host device.

Preferably, the buffer is implemented as a fast random access memory or RAM buffer.

Further, from the host device the user can also create a configuration file, whose entries automatically set and control various functions of the interface device **10**, on the interface device **10** which appears to the host device as a hard disk. These settings can be, for example, gain, multiplex or sampling rate settings. By creating and editing a configuration file, normally a text file which is simple to understand with little prior knowledge, users of the interface device **10** are able to perform essentially identical operator actions for almost any data transmit/receive devices which can be attached to the second connecting device via the line **16**, thus eliminating a source of error arising from users having to know many different command codes for different applications. In the case of the interface device **10** according to the present invention it is necessary for users to note the conventions of the configuration file once only in order to be able to use the interface device **10** as an interface between a host device and almost any data transmit/receive device.

As a result of the option of storing any files in agreed formats in the memory means **14** of the interface device **10**, taking into account the maximum capacity of the memory means, any enhancements or even completely new functions of the interface device **10** can be quickly implemented. Even files executable by the host device, such as batch files or executable files (BAT or EXE files), and also help files can be implemented in the interface device, thus achieving independence of the interface device **10** from any additional software (with the exception of the BIOS routines) of the host device. On the one hand, this avoids licensing and/or registration problems and, on the other hand, installation of certain routines which can be frequently used, for example an FFT routine to examine acquired time-domain data in the frequency domain, is rendered unnecessary as the EXE files are already installed on the interface device **10** and appear in the virtual root directory, by means of which the host device can access all programs stored on the interface device **10**.

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In a preferred embodiment of the present invention in which the interface device **10** simulates a hard disk to the host device, the interface device is automatically detected and readied for operation when the host system is powered up or booted. This corresponds to the plug-and-play standard which is currently finding increasingly widespread use. The user is no longer responsible for installing the interface device **10** on the host device by means of specific drivers which must also be loaded; instead the interface device **10** is automatically readied for operation when the host system is booted.

For persons skilled in the art it is however obvious that the interface device **10** is not necessarily signed on when the computer system is powered up but that a special BIOS routine or a driver for a multi-purpose interface can also be started on the host device during current operation of the computer system in order to sign on or mount the interface device **10** as an additional hard disk. This embodiment is suitable for larger workstation systems which are essentially never powered down as they perform, e.g. mail functions or monitor processes which run continuously, for example, in multi-tasking environments.

In the interface device according to the present invention an enormous advantage is to be gained, as apparent in the embodiment described in the following, in separating the actual hardware required to attach the interface device **10** to the data transmit/receive device from the communication unit, which is implemented by the digital signal processor **13**, the memory means **14** and the first connecting device **12**, as this allows a plurality of dissimilar device types to be operated in parallel in identical manner. Accordingly, many interface devices **10** can be connected to a host device which then sees many different "virtual" hard disks. In addition, any modification of the specific hardware symbolized by the second connecting device **15** can be implemented essentially without changing the operation of the interface device according to the present invention. Further, an experienced user can intervene at any time on any level of the existing second connecting device by making use of the above mentioned option of creating a configuration file or adding or storing new program sections for the second connecting device.

An important advantage of the interface device **10** of the present invention is that it also permits extremely high data transfer rates by using, for data interchange, the host device-own BIOS routines which are optimized for each host device by the host device manufacturer or BIOS system manufacturer, or by using driver programs which are normally optimized and included by the manufacturers of multi-purpose interfaces. Furthermore, due to the simulation of a virtual mass storage device, the data is managed and made available in such a way that it can be transferred directly to other storage media, e.g. to an actual hard disk of the host device without, as it were, intervention of the host device processor. The only limitation to long-term data transfer at high speed is therefore imposed exclusively by the speed and the size of the mass storage device of the host device. This is the case as the digital signal processor **13** already formats the data read by the data transmit/receive device via the second connecting device **15** into block sizes suitable for a hard disk of the host device, whereby the data transfer speed is limited only by the mechanical latency of the hard disk system of the host device. At this point, it should be noted that normally data flow from a host device must be formatted in blocks to permit writing to a hard disk and subsequent reading from a hard disk, as known by those skilled in the art.

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The said data transfer rate can be increased further by setting up a direct memory access (DMA) or RAM drive in the host system. As those skilled in the art know, the setting up of a RAM drive requires processor resources of the host device, with the result that the advantage of writing the data to a hard disk drive of the host device essentially without the need for processor resources is lost.

As described above, a data buffer can be implemented in the memory means **14** to permit independence in terms of time of the data transmit/receive device attached to the second connecting device from the host device attached to the first connecting device. This guarantees error-free operation of the interface device **10** even for time-critical applications in multi-tasking host systems.

FIG. 2 shows a detailed block diagram of an interface device **10** according to the present invention.

A digital signal processor (DSP) **1300** is, in a manner of speaking, the heart of the interface device **10**. The DSP can be any DSP but preferably has a 20-MB on-chip random access memory (RAM). Certain instruction sets, for example, can be stored in the RAM already integrated in the DSP. An 80-MHz clock generator is attached to the DSP **1300** in order to synchronize the DSP. The DSP implements a fast Fourier transformation (FFT) in real time and also optional data compression of the data to be transferred from the data transmit/receive device to the host device in order to achieve greater efficiency and to permit interoperation with host devices which have a smaller memory.

In the preferred embodiment of the interface device **10** shown in FIG. 2, the first connecting device **12** of FIG. 1 contains the following components: an SCSI interface **1220** and a 50-pin SCSI connector **1240** for attachment to an SCSI interface present on most host devices or laptops. The SCSI (small computer system interface) interface **1220** translates the data received via the SCSI connector **1240** into data understood by the DSP **1300**, as known by those skilled in the art. Further, the first connecting device **12** comprises an EPP (enhanced parallel port) with a data transfer rate of approx. 1 MBps which delivers a more moderate data transfer rate of 1 MBps by comparison to the data transfer rate of 10 MBps of the SCSI interface. The EPP **1260** is connected to a 25-pin D-shell connector **1280** to permit attachment to a printer interface of a host device for example. Optionally, the first connecting device **12** also comprises a 25-pin connector **1282** which permits the attachment of 8 digital outputs and 8 digital inputs **1284** at a host device.

Preferably, the second connecting device comprises 8 BNC inputs with the calibration relay **1505**, a block **1510** with 8 device amplifiers with an overvoltage protection of  $\pm 75$  V, this block being connected in turn to 8 sample/hold (S&H) circuits **1515**. The calibration relays are relays which permit controlled changeover between a test voltage and a calibration reference voltage. Each sample/hold circuit is connected to a corresponding input of an 8-channel multiplexer **1520** which feeds its output signals via a programmable amplifier **1525** into an analog/digital converter (ADC) with 12 bit and 1.25 MHz **1530** and to the DSP **1300**. The ADC **1530** is controlled by means of a 20-bit timer **1535**, as known by persons skilled in the art. The programmable amplifier **1525** and the 8-channel multiplexer **1520** are controlled via an amplifier channel selection circuit **1540** which is in turn controlled by the DSP **1300**.

The complete interface device **10** is supplied with power by an external AC/DC converter **1800** which delivers a digital supply voltage of  $\pm 5$  V and is attached to a DC/DC

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converter **1810** which can deliver analog supply voltages of  $\pm 5$  V and  $\pm 15$  V as required for the interface device **10**. Further, the DC/DC converter controls a precision voltage reference **1820** which controls the 8 BNC inputs **1505** and the ADC **1530** as well as a digital/analog converter (DAC) **1830** which permits, via an output amplifier block with 4 output amplifiers **1840** and a 9-pin connector **1850**, analog output direct from the DSP **1300** to an output device, e.g. printer device or monitor device, which can be attached via the 9-pin connector **1850**, thus providing the option of monitoring the data transferred to the host device or also, for example, of viewing an FFT to obtain rapid and comprehensive data analysis without using processor time of the host device.

In FIG. 2 the memory means **14** of FIG. 1 is implemented by an EPROM **1400** which, in a preferred embodiment of the present invention, contains the operating system of the digital signal processor **1300**. A random access memory with an access time of 15 ns and a size of 512 KB or optionally 1024 KB **1420** serves as a data buffer to achieve independence in terms of time of the output line **16** from the output lines **11a**, **11b** and **11c** to the data transmit/receive device and to the host device respectively. As described above, in a preferred embodiment of the present invention the digital signal processor **1300** already contains a 20-KB on-chip RAM **1440** which can store certain instruction sets, functions and also smaller application software units.

The connection, symbolized by the line **16**, of the interface device **10** to any data transmit/receive device implements, by means of the blocks **1505**–**1535**, an analog input with a sampling rate of 1.25 MHz and quantization of 12 bits. There are 8 channels with an overvoltage protection of  $\pm 75$  V. By means of the programmable amplifier **1525** the channels can be programmed independently of each other in voltage ranges up to a maximum of  $\pm 10$  V. Unused channels can be grounded internally to reduce channel intermodulation. The block **1515** is implemented as a monolithic high-precision, high-speed sample/hold amplifier for simultaneous sampling of all channels. The precision voltage reference **1820** provides a high-precision, temperature-compensated monolithic energy gap voltage reference for auto-calibration of each channel and each gain. Further, offset fine adjustment for each channel is implemented by the same.

The blocks **1830**, **1840** and **1850** implement a direct analog output for the digital signal processor **1300**, and the DAC **1830** provides a data transfer rate of 625 kHz and a quantization of 12 bits. The block **1840** comprises 4 channels with a common output latch.

Further, the interface device **10** comprises a digital input/output device implemented by the blocks **1284** and **1282**. Here there are 8 digital inputs, 8 digital outputs with a common latch, and the digital port can be attached preferably to a side panel of the interface device **10** so that the port itself can easily be accessed.

The digital signal processor **1300** provides on-board digital data processing. In particular, it is a high-performance DSP with a clock speed of 80 MHz and a 20-bit timer **1535**.

As described above, the first connecting device **12** comprises the SCSI interface **1220** with a peak transfer rate of 10 MBps. An optional PCMCIA-to-SCSI adapter permits high-speed communication with laptop computers which are desirable and in widespread use, particularly by mobile service technicians. The EPP **1260** with its associated connector **1280** permits data transfer at a more moderate rate.

As described above, the interface device **10** is supplied with power by means of an external AC/DC adapter which

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has a universal power input (85–264 VAC, 47–63 Hz). Interference suppression complies with the standards EN 55022, curve B and FFC, Class B). Further, it is also in accordance with international safety regulations (TÜV, UL, CSA). The interface device **10** is externally shielded and achieves a value of 55 dB at 30–60 MHz and a value of approximately 40 dB at 1 GHz, and therefore complies with the MILSTD 285-1 standard.

As described above, communication between the host device and the multi-purpose interface can take place not only via drivers for input/output device customary in a host device which reside in the BIOS system of the host device but also via specific interface drivers which, in the case of SCSI interfaces, are known as multi-purpose interface ASPI (advanced SCSI programming interface) drivers. This ASPI driver, which can also be referred to as an ASPI manager, is specific to a special SCSI host adapter, i.e. to a special multi-purpose interface, and is normally included by the manufacturer of the multi-purpose interface. Generally speaking, this multi-purpose interface driver has the task of moving precisely specified SCSI commands from the host system program to the host system SCSI adapter. For this reason, the command set is almost identical to that of the SCSI interface itself. Essentially, only status and reset commands for the host adapter have been added.

The ASPI driver can be used if the hard disk was not already addressable at boot time or if the SCSI-related BIOS routines of the host computer were still disabled. Here too, the steps needed to initialize the interface device, preferably as a virtual hard disk, are similar to the steps taken when initializing at boot time.

In general terms, the ASPI manager comprises two sides. One side is the proprietary, hardware-oriented side. It is responsible for converting all commands into a form required by the corresponding multi-purpose interface. The hardware-oriented side of the ASPI driver is therefore matched to a very specific type of multi-purpose interface or SCSI interface. The other side is known as the user software side. This side is totally independent of the proprietary operating characteristics of the SCSI adapter and is therefore identical for all SCSI interfaces. This permits SCSI programming which is however independent of the individual SCSI adapter types.

In contrast to communication between the host device and the interface device according to the present invention on the basis of a BIOS driver, the use of such an ASPI driver for communication between the host device and the interface device according to the present invention allows various further possibilities of the SCSI multi-purpose interface to be exploited. In the case described above, the interface device which preferably signs on and behaves as a virtual hard disk is detected by the BIOS driver of the host computer at boot time and is configured as a hard disk. This step does not however support active requests sent by the interface device to the host computer. If however the virtual hard disk wishes to write data actively to, for example, a hard disk of the host computer or wishes to initiate communication with the processor of the host computer, the host computer must recognize the request of the virtual hard disk and tolerate a further issuer of instructions on its bus. If the interface device behaves solely like a virtual hard disk, it would always receive and never issue commands. The BIOS has no objections to an additional issuer of commands that actively wishes to place data on the bus of the host device but the BIOS does not support the host device in recognizing corresponding requests of the interface device or in granting the interface device permission to access the bus.

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Using the ASPI manager the interface device according to the present invention can now obtain active access to an SCSI hard disk of the host device connected to the same SCSI bus which, in contrast to the interface device, cannot be a virtual but a real SCSI mass storage device or also a further interface device according to the present invention. Thereupon, the interface device according to the present invention can write the desired data to the SCSI hard disk of the host computer totally independently of the host computer or can communicate with the same in some other manner. The interface device according to the present invention therefore initially behaves passively as a virtual hard disk and then, as required and using the driver software for the multi-purpose interface, actively on the same SCSI bus. This means however that the interface device according to the present invention, using a driver software for the multi-purpose interface which comprises the BIOS routines customary in host devices and simultaneously provides the option of active participation, can, regardless of the type of the data transmit/receive device attached to the second connecting device, behave initially as a virtual and at the same time passive hard disk but can, as required, participate actively on the bus so as to be able to initiate communication directly with other SCSI hard disks of the host device by bypassing the processor of the host device.

Using a standard interface of a host device, the interface device according to the present invention permits communication with any host device. By simulating an input/output device to the host device and, in a preferred embodiment, by simulating a virtual mass storage device, the interface device 10 is automatically supported by all known host systems without any additional sophisticated driver software. The simulation of a freely definable file structure on the "virtual" hard disk provides simple operation and expansion options and, through the implementation of any programs, independence from special software implemented on the host device. Help files included on the interface device 10 and plug-and-play support ensure ease of use even in portable, flexible host devices. Despite the very simple user interface, experienced users are free at any time to intervene in the functions of the interface device 10 on system level. The interface device 10 thus provides a universal solution which can cover the entire spectrum of possible data transmit/receive devices.

What is claimed is:

1. An interface device for communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device comprising the following features:

- a processor;
- a memory;
- a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and
- a second connecting device for interfacing the interface device with the data transmit/receive device,

wherein the interface device is configured by the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device,

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whereupon the host device communicates with the interface device by means of the driver for the storage device customary in a host device, and

wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a directory structure.

2. An interface device in accordance with claim 1, in which the directory structure has a configuration file for setting and controlling functions of the interface device or an executable or a batch file for conducting a routine stored in the memory or a data file used for transferring data from the data transmit/receive device to the host device or a help file for giving help on handling the interface device.

3. An interface device in accordance with claim 2 wherein the configuration file is a text file.

4. An interface device in accordance with claim 2 wherein the executable file includes a Fast Fourier Transform routine for transforming data acquired by the second connecting device into the frequency domain and for examining frequency domain data.

5. An interface device in accordance with claim 2 wherein the executable file includes a data compression routine for compressing data to be transmitted from the data transmit/receive device to the host device.

6. An interface device in accordance with claim 1 wherein, in response to a request from the host to read a boot sequence, the processor is arranged to send a virtual boot sequence to the host.

7. An interface device in accordance with claim 6 wherein the virtual boot sequence includes a starting position and a length of a file allocation table, an indication of a type of the storage device or a number of sectors of the storage device.

8. An interface device in accordance with claim 7 wherein, in response to a request from the host to display a directory of the storage device, a processor is arranged for transferring the file allocation table and the directory structure to the host.

9. An interface device in accordance with claim 1 wherein the file allocation table and the directory structure is transferred to the host in response to a request from the host to read data from or store data to the storage device.

10. An interface device in accordance with claim 1 wherein the directory structure includes a data file for transferring data from the data transmit/receive device to the host device wherein the processor is arranged to interpret a request from the host to read the data file as a request for a data transfer from the data transmit/receive device to the host, so that data is transmitted from the second connecting device to the first connecting device and to the host.

11. An interface device in accordance with claim 10 wherein the directory structure further includes a configuration file for specifying a time period for a measurement by the data transmit/receive device, wherein the interface device is arranged for simulating a length of the data file to the host that corresponds to an anticipated volume of data produced by the data transmit/receive device in the specified time period.

12. An interface device in accordance with claim 1 wherein the file allocation table includes information on numbers of blocks occupied by the data file wherein the interface device is arranged for receiving block numbers or a block number range from the host when the host wants to read the data file, and wherein the interface device is arranged to start a data transfer to the host, when the block numbers or the block number range is received from the host.

13. An interface device in accordance with claim 12 wherein the processor is arranged for formatting the data

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acquired by the second connecting device into blocks having a predetermined size, the predetermined size being suited for the storage device.

14. An interface device in accordance with claim 1 wherein the functions are gain, multiplex or synchronization settings of the second connecting device. 5

15. An interface device in accordance with claim 1 wherein the storage device is a hard disk.

16. An interface device in accordance with claim 1 wherein the memory has a data buffer for permitting independence in terms of time of the data transmit/receive device attachable to the second connecting device from the host device attachable to the first connecting device. 10

17. An interface device for communication between a host device, which comprises a multi-purpose interface and a specific driver for this interface, and a data transmit/receive device comprising the following features: 15

a processor;

a memory; 20

a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and

a second connecting device for interfacing the interface device with the data transmit/receive device, 25

where the interface device is configured using the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached at the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device, 30

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whereupon the host device communicates with the interface device by means of the specific driver for the multi-purpose interface, and

wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a file allocation table and a directory structure.

18. A method of communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device via an interface device comprising the following steps:

interfacing of the host device with a first connecting device of the interface device via the multi-purpose interface of the host device;

interfacing of the data transmit/receive device with a second connecting device of the interface device;

inquiring by the host device at the interface device as to the type of device to which the multi-purpose interface of the host device is attached;

regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, responding to the inquiry from the host device by the interface device in such a way that it is a storage device customary in a host device, whereupon the host device communicates with the interface device by means of the usual driver for the storage device, and wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a file allocation table and a directory structure.

\* \* \* \* \*

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLUMBIA

IN RE PAPST LICENSING GMBH & CO.  
KG LITIGATION

This Document Relates To:

Casio, No. 06-cv-1751

Misc. Action No. 07-493 (RMC)  
MDL Docket No. 1880

CASIO'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES TO  
PAPST LICENSING GMBH & CO. KG'S  
INTERROGATORY NO. 1 TO CASIO INC.

Pursuant to Rule 33 of the Federal Rules of Civil Procedure, Casio, through counsel, hereby provides a supplemental response to Papst's Interrogatory No. 1.

GENERAL OBJECTIONS

The General Objections and Objections to Instructions and Definitions provided in Casio's initial response to these interrogatories are incorporated by reference.

PAPST'S INTERROGATORIES

INTERROGATORY NO. 1: Describe in full and complete detail how each Casio Digital Camera does not infringe each of the Patents-in-Suit.

OBJECTIONS:

Casio Inc. objects to the deceptive nature in which this interrogatory was written. Stating the interrogatory in this manner, and "defining" it to be wildly overbroad and to request information not even remotely related to the request as written, is an obvious attempt to deceive Casio Inc. into inadvertently waiving objections, or dupe the Court into thinking that Papst is being reasonable in its requests. The request violates Federal Rule 26(g) as "defined" in the Papst instructions, and Papst is hereby put on notice that, in the event this interrogatory is ever brought before the Court, the full overbroad scope of what Papst seeks must be shown to the Court, including the deceptive manner in which Papst attempted to get that information.

**EXHIBIT B**

Casio Inc. objects to the definition provided to this interrogatory, as overbroad, unduly burdensome, calling for irrelevant information not reasonably calculated to lead to the discovery of admissible information, as calling for information that is subject to the attorney client privilege, work product, or other immunity, and calls for disclosure of confidential information to Welsh & Katz. Casio will respond only by considering the actual interrogatory recited above, and will provide information only for the first independent claims of the patents as Papst has to date refused to (or has been unable to) explain how the Casio cameras supposedly infringe on these patents, and has not identified any allegedly infringed claims. Casio will only address the claim elements that are missing, not every claim element, and Casio will provide reasonable detail on the reasons for non-infringement. All other requests are overly broad, unduly burdensome, call for information that is irrelevant and not reasonably calculated to lead to the discovery of admissible evidence.

Casio reserves its right to supplement this response as the case proceeds, including but not limited to supplementation after the Court construes the claims, or upon learning Papst's proposed constructions and contentions which, to date, Papst has been unable to provide.

Casio objects to this Interrogatory as improperly being characterized as one interrogatory because its many subparts constitute separate interrogatories. See Fed. R. Civ. P. 33(a).

Subject to its general and specific objections, Casio responds as follows.

**FIRST RESPONSE**

Casio's cameras do not infringe Papst's patents because Casio's cameras do not meet every claim limitation either literally or under the doctrine of equivalents when comparing the properly construed claims to the accused products. At least the following claim elements are missing from Casio's cameras. Citations in this section are to the '399 patent, but as the '449 patent has the same specification, the support can equally be found in that patent and Casio will rely on the specifications of both patents.

**EXHIBIT B****Interface device**

No Casio Digital Camera has the required limitation of an “interface device” as that term is properly construed. Both patents teach an interface device that is separate from the transmit/receive (“T/R”) device. For example, the ‘399 patent states at 8:23-33: “In the interface device according to the present invention, an enormous advantage is to be gained . . . in separating the actual hardware . . . [which] allows a plurality of dissimilar device types. . . .”. Similarly, at 1:55-64, the patent discusses different uses of the interface, e.g., a “large number of applications,” and it refers to “any data transmit/receive devices which can be attached to the second connecting device. . . .” (7:41-43). The patents also state that “the interface device according to the present invention . . . [can be used] as an interface between a host device and almost any data transmit/receive device” (‘399 patent, 7:45-49).

The patent claims also clearly require that the interface be separate from the transmit/receive device. See, for example, the language that requires connecting devices for interfacing them, and the language that requires the host to ask what type of device is “attached” to the interface, and requires the interface device to send a signal to the host “regardless of the type of the data transmit/receive device attached.” Thus, the claim language itself makes the ability of a transmit/receive device to “attach” very clear, particularly when considered in light of the specification noted above.

The patents distinguish prior art devices with specific drivers for specific transmit/receive devices. See, e.g., ‘399 patent at 1:20-34. They also teach that the interface must be “flexible to permit attachment of very different electrical or electronic systems to a host device by means of the interface. . . .” Id. At 1:56-60. Every embodiment disclosed in the patents has a separate interface device, and there is inadequate support under 35 U.S.C. 112 for anything but a separate interface device.

All these teachings are inconsistent with an analysis that has the interface device be a selected group of components within the camera itself. This concept runs through both patents and there is never any indication that the applicants had anything in mind other than a separate structure for the interface.

As with all missing claim elements, it is very difficult for Casio to try to explain why there is no infringement by equivalents, as Papst has been unable to provide even a literal infringement analysis, let alone an analysis by equivalents. However, it is clear that any attempt to read this interface limitation and the related language of the claim requiring that devices “attach” to the interface would improperly vitiate this claim language. Moreover, there are clearly very substantial differences in the Casio products and the claimed structure. Indeed, the “enormous advantage” taught by the patents themselves, and the “flexible” nature of the claimed structure are completely missing in the Casio cameras. And given that prior art was distinguished on this ground, no reasonable equivalents analysis could capture the Casio cameras. Casio reserves its right to supplement this response, should Papst ever be able to provide a realistic infringement analysis.

**Data transmit/receive device**

No Casio Digital Camera has the required limitation of a “data transmit/receive device” (“T/R device”) as that term is properly construed. A T/R device would be understood by a person of ordinary skill in the art to mean a device that transmits and receives information in the

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same form. Thus, the CCD identified by Papst as the T/R device could not possibly meet this limitation, as it converts light into an electrical signal – a completely different form of data.

If the patentee had meant that different types of data could be transmitted and received, the claim could have said "a transmit device and a receive device" and these could have transmitted and received different types of data. A data/transmit device is not a device for converting data from one form to another, as is the CCD of the Casio cameras.

With regard to equivalents, this required element is completely missing, and thus any attempt to capture the Casio products under the doctrine of equivalents would improperly vitiate these claim terms in their entirety. It is clear that the Casio CCD functions in a substantially different way, and achieves a different result. Casio has no idea how Papst intends to try to use the doctrine of equivalents to eviscerate this claim limitation, or even if Papst will continue to believe the CCD meets this limitation, and so reserves its right to supplement this response should Papst ever attempt to make such an argument.

### **Communication between**

Further, because Casio's Digital Cameras lack the required limitation that there be a communication between the lens/CCD and host, Casio does not infringe any claim of the '399 or '449 patents.

The "communication between" limitation is part of every claim of the '399 and '449 patents. When properly construed, the T/R device and host must have two-way communication, not just data transfer from one to the other. The word "between" requires two-way communication, and later language in the claims uses the words "from" and "to" showing a contrast with the "between" language used for this communication. *Cf. e.g.*, "a data request command from the host device to the type of input/output device..." and "transfer of the digital data to the host device." This language also shows that communication between the host and T/R device must be bi-directional (commands from the host and data transfer from the T/R device, i.e., if the host requests the data, the T/R device must be able to send data in response thereto). There must be an interchange or exchange of data, as claimed and as plainly taught in the specification. *See, e.g.*, the abstract ("communication between"); '399, 1:9-14 (distinguishing data acquisition and two-way communication).

The lens/CCD of the Casio cameras (which counsel for Papst has alleged to be the T/R device) never receives data from the computer, and in fact, that lens/CCD is not functional at all when the camera is connected to the computer. The only communication with the computer is a communication between the computer and the camera memory, the computer never "communicates" with the lens/CCD.

Even if "communication between" is construed to not require two-way communication, the Casio lens/CCD combination does not communicate at all with the host computer. Rather, the lens/CCD merely sends data to the Analog to Digital ("A/D") converter, and that data is stored in the camera memory. When the camera is attached to the computer, the computer collects information directly from the camera memory. The lens/CCD is not involved in the function of communicating with the computer. The '399 patent, at column 5, lines 47-63, discusses first that data must be "acquired, and transferred to the host device," and in the very next sentence distinguishes that from communication: "The data transmit/receive device itself can also communicate actively with the host device." The communication is described as something different from an intermediate memory merely storing and then sending on data to the

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host, and it requires, as the claims state, actual communication between the T/R device and the host computer. See also, 6:55-68 (the host computer user reading data “from the data transmit/receive device . . .” and discussing the interface function of transferring data “from the data transmit/receive device . . . to the host device . . .”). The patents distinguish the claimed communication between the host and T/R device from “communication between the host device and interface device” (‘399 patent, at 7:14-15).

With regard to equivalents, this required element is completely missing, and thus any attempt to capture the Casio products under the doctrine of equivalents would improperly vitiate these claim terms in their entirety. Moreover, the Casio products function in a substantially different way, in that the cameras do not perform a function that is substantially the same as bi-directional communication. Rather, communication cannot take place between the host device and the imaging portion of the camera. Casio does not know how, if at all, Papst intends to try to use the doctrine of equivalents to eviscerate this claim limitation, and so reserves its right to supplement this response should Papst ever attempt to make such an argument.

**Configured by the processor and memory**

Even assuming that the Casio CPU and memory are part of an “interface device” as counsel for Papst has asserted, the interpreters in that alleged interface are certainly not configured “by” the processor and memory as expressly required by the claims. The “interpreters” in that alleged interface, to the extent they can even be argued to exist, are software. This software is simply loaded into the memory. The Casio processor has nothing to do with that operation. The memory of the Casio cameras also do not “configure” this in any way, but merely store the software.

The requirement that the interface device interpreters be configured by the processor and memory is not only clear from the claim language, but also from the specification. See, e.g., ‘399 patent, 3:36-47, 3:58-67, 4:65-5:6.

With regard to equivalents, this required element is completely missing, and thus any attempt to capture the Casio products under the doctrine of equivalents would improperly vitiate these claim terms in their entirety. Moreover, the Casio products function in a substantially different way, in that the processor and memory do nothing to configure as required by the claims, and instead software is simply loaded into the Casio cameras. The prosecution history also provides guidance. See e.g., March 18, 2002 Response to Office Action. Casio has no idea how Papst intends to try to use the doctrine of equivalents to eviscerate this claim limitation, and so reserves its right to supplement this response should Papst ever attempt to make such an argument.

**Input/output device customary in a host device, regardless of the device attached**

Further, no claim of the ‘399 patent nor the ‘449 patent are infringed by Casio because no Casio Digital Camera has the required limitation of an “input/output device customary in a host device,” as that term is properly construed. The claims require that the first command interpreter send a signal to the host that it is an “input/output device customary in a host device.” The Casio camera signals that it is a Casio camera, not a device “customary in a host device,” and it does not provide this information “regardless” of “the device attached”.

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The patent specification clearly supports the plain and ordinary meaning. *See, e.g.*, Abstract (regardless of the device attached); '399 patent, 3:36-47; 3:59-67, 4:8-20, 4:60-5:6; 6:19-22.

The claims and the file history both require that the interface device “lie” to the host computer about the real nature of the device. Indeed, prior art was distinguished on precisely this ground during prosecution, creating an estoppel. As above, Casio cameras never lie to the host computer. Rather, the Casio cameras identify themselves as Casio cameras.

This required element is also completely missing, and thus any attempt to capture the Casio products under the doctrine of equivalents would improperly vitiate these claim terms in their entirety. Moreover, the Casio products function in a substantially different way, in that the cameras identify themselves to a host device only for the specific hardware arrangement of the camera itself and no other. This is neither substantially the same function as “regardless” of “the device attached” nor substantially the same way. Casio does not know how Papst intends to try to use the doctrine of equivalents to eviscerate this claim limitation, and so reserves its right to supplement this response should Papst ever attempt to make such an argument.

**Virtual file system**

With respect specifically to the claims of the '449 patent, all require the interface device to simulate a virtual file system. A virtual file system is described, for example, in the '399 patent at 6:1-3: the interface device “simulates a hard disk with a root directory whose entries are ‘virtual’ and can be created for the most varied functions.” Also, as described in the '449 patent at 11:1-6 and the '399 patent at 11:66-12:4: “Using the ASPI manager the interface device according to the present invention can now obtain active access to an SCSI hard disk of the host device connected to the same SCSI bus which, in contrast to the interface device, cannot be a virtual but a real SCSI mass storage device or also a further interface device according to the present invention.” *See also*, '399 patent, 12:25-33, and the '449 prosecution history (e.g., 5/17/04 Notice of Allowability).

In the Casio cameras, the computer directly accesses a real file system. The system is not “virtual” in any sense of the word.

With regard to equivalents, this required element is also completely missing, and thus any attempt to capture the Casio products under the doctrine of equivalents would improperly vitiate these claim terms in their entirety. Moreover, the Casio products function in a substantially different way, in that with respect to Casio cameras, the computer directly accesses a real file system. The system is not “virtual” in any way. Casio has no idea how Papst intends to try to use the doctrine of equivalents to eviscerate this claim limitation, and so reserves its right to supplement this response should Papst ever attempt to make such an argument.

**SUPPLEMENTAL RESPONSE**

All the objections and responses in our First Responses are incorporated by reference.

Casio Inc.'s proposed claim constructions were already provided above for the elements that appear to be at issue, but Casio, Inc. herein supplements those constructions in a good faith effort to address questions of counsel for Papst, and despite Papst's refusal to provide proper claim constructions as ordered by the Court. Casio reserves its right to supplement this response

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as the case proceeds, including but not limited to supplementation after the Court construes the claims, or upon learning Papst's proposed constructions and contentions which, to date, Papst has been unable to provide.

Casio notes that it has not been accused of direct infringement of any claim, nor could it be because it does not make or sell the host. Despite repeated Court orders to explain how it is contending that Casio infringes, Papst has not provided any cogent theory of infringement. Papst should be precluded from advancing any infringement theory now, but to the extent that ever happens, Casio will respond and supplement as necessary.

**I. Claim 1 of United States Patent 6,470,399**

**A. An interface device for communication between**

**"Interface Device" interpretation:** "Interface Device" means a physically separate and distinct component different from the host device or the Data Transmit/Receive Device that is capable of regulating the electrical communications between host device and a plurality of interchangeable data transmit/receive devices.

Both patents teach an interface device that is separate from the transmit/receive ("T/R") device. For example, the '399 patent states at 8:23-33: "In the interface device according to the present invention, an enormous advantage is to be gained . . . in separating the actual hardware . . . [which] allows a plurality of dissimilar device types. . . .". Similarly, at 1:55-64, the patent discusses different uses of the interface, e.g., a "large number of applications," and it refers to "any data transmit/receive devices which can be attached to the second connecting device. . . ." (7:41-43). The patents also state that "the interface device according to the present invention . . . [can be used] as an interface between a host device and almost any data transmit/receive device" ('399 patent, 7:45-49). See also the claims, which refer to a "multi-purpose" interface.

The patent claims also clearly require that the interface be separate from the transmit/receive device. See, for example, the language that requires connecting devices for interfacing them, and the language that requires the host to ask what type of device is "attached" to the interface, and requires the interface device to send a signal to the host "regardless of the type of the data transmit/receive device attached." Thus, the claim language itself makes the ability of a transmit/receive device to "attach" very clear, particularly when considered in light of the specification noted above.

The patents distinguish prior art devices with specific drivers for specific transmit/receive devices. See, e.g., '399 patent at 1:20-34. They also teach that the interface must be "flexible to permit attachment of very different electrical or electronic systems to a host device by means of the interface. . . ." *Id.* at 1:56-60. Every embodiment disclosed in the patents has a separate interface device, and there is inadequate support under 35 U.S.C. 112 for anything but a separate interface device. Casio also relies on the plain and ordinary meaning of these terms.

**"communication between" interpretation:** "Communication Between" means two-way communication directly between the host and input/output device.

The "communication between" limitation is part of every claim of the '399 and '449 patents. When properly construed, the T/R device and host must have two-way communication, not just data transfer from one to the other. The word "between" requires two-way communication, and later language in the claims uses the words "from" and "to" showing a contrast with the "between" language used for this communication. *Cf. e.g.*, "a data request

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command from the host device to the type of input/output device..." and "transfer of the digital data to the host device." This language also shows that communication between the host and T/R device must be bi-directional (commands from the host and data transfer from the T/R device, i.e., if the host requests the data, the T/R device must be able to send data in response thereto). There must be an interchange or exchange of data, as claimed and as plainly taught in the specification. *See, e.g.*, the abstract ("communication between"); '399, 1:9-14 (distinguishing data acquisition and two-way communication).

The '399 patent, at column 5, lines 47-63, also discusses first that data must be "acquired, and transferred to the host device," and in the very next sentence distinguishes that from communication: "The data transmit/receive device itself can also communicate actively with the host device." The communication is described as something different from an intermediate memory merely storing and then sending on data to the host, and it requires, as the claims state, actual communication between the T/R device and the host computer. *See also*, 6:55-68 (the host computer user reading data "from the data transmit/receive device . . ." and discussing the interface function of transferring data "from the data transmit/receive device . . . to the host device . . ."). The patents distinguish the claimed communication between the host and T/R device from "communication between the host device and interface device" ('399 patent, at 7:14-15). Casio also relies on the plain and ordinary meaning of these terms.

#### No Infringement

The Casio cameras are not and do not have Interface Devices as properly construed, as they have no separate interface, and they have nothing with the ability to regulate a plurality of interchangeable devices. The Casio cameras also do not have two way communications between the host device and interface device. Accordingly, these elements provide two reasons why there is no infringement. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

#### **B. a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and**

**Interpretation** : "Host Device" means a separate and distinct hardware component from the interface device or the data transmit/receive device. The host device must include software drivers for input/output devices that are connected to the interface device and "customary in a host device" (see below), and also drivers for a multipurpose interface. Casio also relies on the plain and ordinary meaning of these terms.

**"customary" interpretation**: The term "customary" in the context of the '399 and '449 patents is vague and unsupported for any interpretation other than for "drivers for hard disks, for graphics devices or for printer devices ... or other storage devices such as floppy disk drives, CD-ROM drives or tape drives." In any event, there is nothing in the patents that suggests that cameras would be "customary". See '399 patent col. 4, lns. 27-39. Indeed the word "camera" never appears in the patent specification at all. Casio also relies on the plain and ordinary meaning of these terms.

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No Infringement

The Casio cameras do not have host devices as properly construed. They are sold as stand-alone cameras. Casio cameras also have nothing to do with any "customary" drivers for hard disks, for graphics devices or for printer devices or other storage devices such as floppy disk drives, CD-ROM drives or tape drives. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

**C. a data transmit/receive device, the data transmit/receive device being arranged for providing analog data, comprising:**

**Interpretation** : "Data Transmit/Receive Device" means a distinct piece of hardware separate from an Interface Device capable of providing and/or receiving analog data directly to and/or from a host device through the separate Interface Device. The Data Transmit/Receive Device must transmit and receive information in the same form.

A Data Transmit/Receive Device limitation is part of every claim of the '399 and '449 patents. A "T/R" device would be understood by a person of ordinary skill in the art to mean a device that transmits and receives information in the same form. Moreover, if the patentee had meant that different types of data could be transmitted and received, the claim could have said "a transmit device and a receive device" and these could have transmitted and received different types of data. A data/transmit device is not a device for converting data from one form to another. Further, one of ordinary skill in the art would recognize that the claim itself requires that the data format of the communication be analog, as opposed to digital. Casio also relies on the plain and ordinary meaning of these terms.

No Infringement

Casio's digital cameras are unitary pieces of hardware without interface devices separate from data transmit/receive devices. Casio's digital cameras do not have any components that can both transmit and receive analog data, and the components alleged by Papst to meet these limitations do not transmit and receive data in the same form. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

**D. a processor;**

**Interpretation**: Processor means the microprocessor of a computer capable of receiving and executing logical instructions. Casio also relies on the plain and ordinary meaning of this term.

No Infringement

Casio does not dispute that its cameras have a processor, but does not infringe due to the many other missing claim elements. See also Casio's first response.

**E. a memory;**

**Interpretation**: Memory has its ordinary meaning, and includes any memory. '399 patent col. 7, lns 23-29. Casio also relies on the plain and ordinary meaning of this term.

No Infringement

Casio does not dispute that its cameras have a memory, but does not infringe due to the many other missing claim elements. See also Casio's first response.

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**F. a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and**

**Interpretation:** "First connecting device" means the component of the interface device that electrically connects the host device to the separate interface device. The first connecting device also allows direct, two way communication between the host device and the interface device.

No Infringement

Casio does not provide any host device with its digital cameras and so does not meet this element of the claim, and Papst has not asserted any indirect claims of infringement. Moreover, as Casio has no "interface device" as properly interpreted, that provides another reason why this language is not met. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

**G. a second connecting device for interfacing the interface device with the data transmit/receive device, the second connecting device including a sampling circuit for sampling the analog data provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into digital data,**

**Interpretation:** This language means a component of the interface device that electrically connects a transmit/receive device to the separate interface device. The second connecting device also must allow direct, two way communication between a transmit/receive device and the interface device. Also, the second connecting device must include both a circuit for sampling the analog data that is provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into digital data. Casio also relies on the plain and ordinary meaning of this phrase.

No Infringement

Casio's digital cameras have no second connecting device that electrically connects a transmit/receive device to a physically separate interface device. Casio's digital cameras also have no second connecting device that allows direct, two way communication between a transmit/receive device to the separate interface device. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

**H. wherein the interface device is configured by the processor and the memory to include a first command interpreter and a second command interpreter,**

**Interpretation:** This phrase means that the processor and the memory built into the interface device together are responsible for the configuration of the interface device into a distinct first command interpreter and a distinct second command interpreter. First command interpreter and second command interpreter are defined elsewhere. The interface device must be configured by the processor and memory, which does not include simply downloading software into the camera from an external source.

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The requirement that the interface device interpreters be configured by the processor and memory is not only clear from the claim language, but also from the specification. *See, e.g.*, '399 patent, 3:36-47, 3:58-67, 4:65-5:6.

This configuration must also create all of the functionality required as defined in the definition of the first command interpreter and second command interpreter.

No Infringement

The Casio processor and memory do not configure anything that functions as a distinct first command interpreter or a distinct second command interpreter. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

- I. wherein the first command interpreter is configured in such a way that the command interpreter, when receiving an inquiry from the host device as to a type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is an input/output device customary in a host device,

**Interpretation:** This means a structure within the interface device that is configured by the processor and memory of the interface device. The first command interpreter must be capable of sending a signal to the host device when an inquiry from the host device is received requesting the type of a device that is attached to the interface device. The signal sent to the host by the first command interpreter must "lie" to the host and tell the host that something other than what is connected to the host is connected. *See, eg.*, File History of the '399 patent. This means that regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, the host device must receive a signal that an input/output device "customary" (see response to Interrogatory No. 2) in a host device is attached to the second connecting device of the interface device. Casio also relies on the plain and ordinary meanings of this phrase.

No Infringement

Casio's digital cameras have no structure or functionality that is configured by any interface device's processor and memory that functions as required by this claim language. Further, Casio's digital cameras never "lie" to the host computer about what is connected. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

- J. whereupon the host device communicates with the interface device by means of the driver for the input/output device customary in a host device, and

**Interpretation:** This phrase means that the host device communicates with the interface device using a driver that is "customary" in a host device. The communication, through the "customary" driver must occur regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device. See the response to Interrogatory No. 2 regarding the "customary" language of the claim.

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No Infringement

Casio's digital cameras do not communicate using a "customary" driver, as that term is not clear. See the response to Interrogatory No. 2. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

- K. wherein the second command interpreter is configured to interpret a data request command from the host device to the type of input/output device signaled by the first command interpreter as a data transfer command for initiating a transfer of the digital data to the host device.

**Interpretation:** "Second command interpreter" means a structure or component within the interface device that is configured by the processor and memory of the interface device. This second command interpreter must be capable receiving a data request command from a host computer in the format of a device that the first command interpreter had previously "lied" to the host computer about. This second command interpreter must be capable of understanding the data request command from the host as a data transfer command for initiating the transfer of digital data to the host device.

No Infringement

Casio's digital cameras have no structure or functionality that is configured by any interface device's processor and memory that functions as required by the term second command interpreter. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

II. Claim 1 of U.S. Patent No. 6,895,449

- A. An interface device for communication between

**"Interface Device" interpretation:** "Interface Device" means a physically separate and distinct component different from the host device or the Data Transmit/Receive Device that is capable of regulating the electrical communications between host device and a plurality of interchangeable kinds of data transmit/receive devices.

Both patents teach an interface device that is separate from the transmit/receive ("T/R") device. For example, the '449 patent states at 7:23-30: "In the interface device according to the present invention, an enormous advantage is to be gained . . . in separating the actual hardware . . . [which] allows a plurality of dissimilar device types. . . .". Similarly, at 1:56-65, the patent discusses different uses of the interface, e.g., a "large number of applications," and it refers to "any data transmit/receive devices which can be attached to the second connecting device. . . ." (6:41-42). The patents also state that "the interface device according to the present invention . . . [can be used] as an interface between a host device and almost any data transmit/receive device" ('449 patent, 6:45-49). See also the claims, which refer to a "multi-purpose" interface.

The patent claims also clearly require that the interface be separate from the transmit/receive device. See, for example, the language that requires connecting devices for interfacing them, and the language that requires the host to ask what type of device is "attached" to the interface, and requires the interface device to send a signal to the host "regardless of the type of the data transmit/receive device attached." Thus, the claim language itself makes the

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ability of a transmit/receive device to "attach" very clear, particularly when considered in light of the specification noted above.

The patents distinguish prior art devices with specific drivers for specific transmit/receive devices. *See, e.g.*, '449 patent at 1:21-34. They also teach that the interface must be "flexible to permit attachment of very different electrical or electronic systems to a host device by means of the interface...." *Id.* at 1:58-60. Every embodiment disclosed in the patents has a separate interface device, and there is inadequate support under 35 U.S.C. 112 for anything but a separate interface device. Casio also relies on the plain and ordinary meaning of these terms.

**"communication between" interpretation:** "Communication Between" means two-way communication directly between the host and input/output device.

The "communication between" limitation is part of every claim of the '399 and '449 patents. When properly construed, the T/R device and host must have two-way communication, not just data transfer from one to the other. The word "between" requires two-way communication, and later language in the claims uses the words "from" and "to" showing a contrast with the "between" language used for this communication. *Cf. e.g.*, "a data request command from the host device to the type of input/output device..." and "transfer of the digital data to the host device." This language also shows that communication between the host and T/R device must be bi-directional (commands from the host and data transfer from the T/R device, i.e., if the host requests the data, the T/R device must be able to send data in response thereto). There must be an interchange or exchange of data, as claimed and as plainly taught in the specification. *See, e.g.*, the abstract ("communication between"); '399, 1:13-17 (distinguishing data acquisition and two-way communication).

The '449 patent, at 4:46-62, also discusses first that data must be "acquired, and transferred to the host device," and in the very next sentence distinguishes that from communication: "The data transmit/receive device itself can also communicate actively with the host device." The communication is described as something different from an intermediate memory merely storing and then sending on data to the host, and it requires, as the claims state, actual communication between the T/R device and the host computer. *See also*, 5:55-67 (the host computer user reading data "from the data transmit/receive device . . ." and discussing the interface function of transferring data "from the data transmit/receive device . . . to the host device . . ."). The patents distinguish the claimed communication between the host and T/R device from "communication between the host device and interface device" ('449 patent, at 6:13-15). Casio also relies on the plain and ordinary meaning of these terms.

#### No Infringement

The Casio cameras are not and do not have Interface Devices as properly construed, as they have no separate interface, and they have nothing with the ability to regulate a plurality of interchangeable devices. The Casio cameras also do not have two way communications between the host device and interface device. Accordingly, these elements provide two reasons why there is no infringement. With regard to equivalents, that has not been asserted by Papst. *See also* Casio's first response.

## EXHIBIT B

**B. a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and**

**Interpretation** : "Host Device" means a separate and distinct hardware component from the interface device or the data transmit/receive device. The host device must include software drivers for input/output devices that are connected to the interface device and "customary in a host device" (see below), and also drivers for a multipurpose interface. Casio also relies on the plain and ordinary meaning of these terms.

**"customary" interpretation:** The term "customary" in the context of the '399 and '449 patents is vague and unsupported for any interpretation other than for "drivers for hard disks, for graphics devices or for printer devices ... [or] other storage devices such as floppy disk drives, CD-ROM drives or tape drives." In any event, there is nothing in the patents that suggests that cameras would be "customary". See '449 patent 3:30-43. Indeed the word camera never appears in the patent specification at all.

**No Infringement**

The Casio cameras do not have host devices as properly construed. They are sold as stand-alone cameras. Casio cameras also have nothing to do with any "customary" drivers for hard disks, for graphics devices or for printer devices or other storage devices such as floppy disk drives, CD-ROM drives or tape drives. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

**C. a data transmit/receive device comprising the following features:**

**Interpretation** : "Data Transmit/Receive Device" means a distinct piece of hardware separate from an Interface Device capable of providing and/or receiving analog data directly to and/or from a host device through the separate Interface Device. The Data Transmit/Receive Device must transmit and receive information in the same form.

A Data Transmit/Receive Device limitation is part of every claim of the '399 and '449 patents. A "T/R" device would be understood by a person of ordinary skill in the art to mean a device that transmits and receives information in the same form. Moreover, if the patentee had meant that different types of data could be transmitted and received, the claim could have said "a transmit device and a receive device" and these could have transmitted and received different types of data. A data/transmit device is not a device for converting data from one form to another. Further, one of ordinary skill in the art would recognize that the claim itself requires that the data format of the communication be analog, as opposed to digital. Casio also relies on the plain and ordinary meaning of these terms.

**No Infringement**

Casio's digital cameras are unitary pieces of hardware without interface devices separate from data transmit/receive devices. Casio's digital cameras do not have any components that can both transmit and receive analog data, and the components alleged by Papst to meet these limitations do not transmit and receive data in the same form. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

EXHIBIT B

**D. a processor;**

**Interpretation:** Processor means the microprocessor of a computer capable of receiving and executing logical instructions. Casio also relies on the plain and ordinary meaning of this term.

No Infringement

Casio does not dispute that its cameras have a processor, but does not infringe due to the many other missing claim elements. See also Casio's first response.

**E. a memory;**

**Interpretation:** Memory has its ordinary meaning, and includes any memory. '449 patent, at 6:23-29. Casio also relies on the plain and ordinary meaning of this term.

No Infringement

Casio does not dispute that its cameras have a memory, but does not infringe due to the many other missing claim elements. See also Casio's first response.

**F. a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and**

**Interpretation:** "First connecting device" means the component of the interface device that electrically connects the host device to the separate interface device. The first connecting device also allows direct, two way communication between the host device and the interface device.

No Infringement

Casio does not provide any host device with its digital cameras and so does not meet this element of the claim, and Papst has not asserted any indirect claims of infringement. Moreover, as Casio has no "interface device" as properly interpreted, that provides another reason why this language is not met. With regard to equivalents, that has not been asserted by Papst. See also Casio's first response.

**G. a second connecting device for interfacing the interface device with the data transmit/receive device,**

**Interpretation:** This language means a component of the interface device that electrically connects a transmit/receive device to the separate interface device. The second connecting device also must allow direct, two way communication between a transmit/receive device and the interface device. Casio also relies on the plain and ordinary meaning of this phrase.

No Infringement

Casio's digital cameras have no second connecting device that electrically connects a transmit/receive device to a physically separate interface device. Casio's digital cameras also have no second connecting device that allows direct, two way communication between a transmit/receive device to the separate interface device. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

## EXHIBIT B

- H. wherein the interface device is configured by the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device,

**Interpretation:** This term means that the processor and the memory built into the interface device together are responsible for the configuration of the interface device to provide the specific functionality described in the rest of the claim. This configuration must enable the interface device to be able to signal to the host that a storage device customary in the host device is attached to the interface device regardless of the type of transmit/receive device actually attached to the interface device.

The interface device must be configured by the processor and memory, which does not include simply downloading software into the camera from an external source. The requirement that the interface device interpreters be configured by the processor and memory is not only clear from the claim language, but also from the specification. See, e.g., '449 patent, 4:6-10.

No Infringement

The processor in combination with the memory in Casio digital cameras do not configure anything to provide functionality to an interface device allowing a signal to be sent to a host that a storage device customary in the host device is attached to the interface device regardless of the type of transmit/receive device actually attached to the interface device. With regard to equivalents, Papst has not asserted infringement by equivalents. See also Casio's first response.

- I. whereupon the host device communicates with the interface device by means of the driver for the storage device customary in a host device, and

**Interpretation:** This phrase means that the host device sends messages to the interface device using a storage device driver that is "customary" in a host device. The communication, through the "customary" driver must occur regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device

The specific language "customary in a host device" is not capable of interpretation. See response to Interrogatory No. 2.

No Infringement

Casio's digital cameras can not be interpreted as customary devices, to the extent the term is definable. Casio's digital cameras are cameras and require drivers associated with cameras, not storage devices.

- J. wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a directory structure.

**"virtual file system" interpretation:** A file system that is not real, but instead simulates a hard disk file system.

## EXHIBIT B

A virtual file system is described, for example, in the '449 patent at 4:67-5:2: the interface device "simulates a hard disk with a root directory whose entries are 'virtual' files which can be created for the most varied functions." Also, as described in the '449 patent at 11:1-6 and the '399 patent at 11:66-12:4: "Using the ASPI manager the interface device according to the present invention can now obtain active access to an SCSI hard disk of the host device connected to the same SCSI bus which, in contrast to the interface device, cannot be a virtual but a real SCSI mass storage device or also a further interface device according to the present invention." *See also*, '449 patent, 12:25-33, and the '449 prosecution history (e.g., 5/17/04 Notice of Allowability).

No Infringement

The file system associated with photographic data in Casio's digital cameras is not virtual, but is an actual file system associated with the storage of data on the internal memory card of Casio's digital cameras.

**SECOND SUPPLEMENTAL RESPONSE**

All the objections and responses in Casio's previous Responses are incorporated by reference. Casio reserves its right to supplement this response as the case proceeds, including but not limited to supplementation after the Court construes the claims, or upon learning Papst's proposed constructions and contentions.

All claims of the '399 patent require

"an analog-to-digital converter for converting data sampled by the sampling circuit into **digital data**" ...

"wherein the second command interpreter is configured to interpret a data request command from the host device ... as a data transfer command for initiating a transfer of **the digital data** to the host device."

**"the digital data" Interpretation:** The plain meaning of the "the digital data" limitation indicates that the camera transfers the same digital data output of its A/D converter to the PC in response to a request from the PC. As further evidence, Papst, in their response to Casio's Interrogatory No. 7, admitted that "[t]he transfer of 'the digital data' refers to the data that was

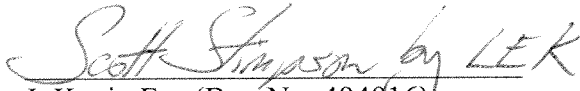
## EXHIBIT B

digitized in the analog-to-digital converter....” See Page 13 of Papst’s Objections and Supplemental to Casio Inc.’s Interrogatory No. 7, served on April 18, 2008.

No Infringement

The data output by the Casio camera's A/D converter is different from the data transferred to the PC because it undergoes processing. Accordingly, Casio's digital cameras do not infringe literally because they do not transfer the same digital data rendered by the A/D converter to the PC. Furthermore, the '399 patent applicant, in response to the rejection of all pending claims in the '399 patent application, amended all of the independent claims to include “an analog-to-digital converter for converting data sampled by the sampling circuit into digital data” and “initiating a transfer of the digital data to the host device” to overcome a § 103 obviousness rejection over certain prior art references. Because the limitation regarding “the digital data” was added by the '399 patent applicant in order to overcome a previous rejection of the claims, equivalents are precluded. See *Ampex Corp. v. Eastman Kodak Co.*, 460 F. Supp.2d 563 (D. Del. 2006), *aff'd*, 2008 WL 343253 (Fed. Cir. 2008).

DATED: May 13, 2008

  
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EXHIBIT B

**CERTIFICATE OF SERVICE**

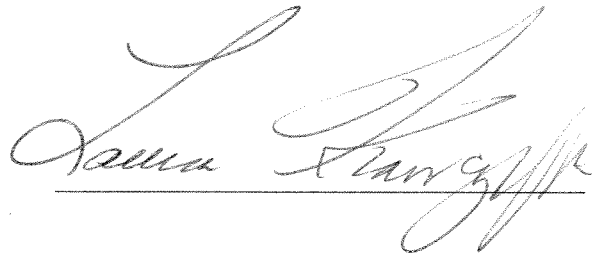
The undersigned hereby certifies that a copy of the foregoing CASIO INC.'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES TO PAPST LICENSING GMBH & CO. KG'S INTERROGATORIES NO.1 TO CASIO INC. was served on this, the 13th day of May, 2008, upon the attorneys for Papst as follows:

**VIA U.S. MAIL and E-MAIL**

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A handwritten signature in cursive script, appearing to read "Laura Langguth", is written over a horizontal line.