IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Issue Date: October 15, 2002
Appl. Serial No.: 09/244,282
Filing Date: February 3, 1999
Title: Method and Apparatus for Receiving Digital Broadcasts

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PETITION FOR INTER PARTES REVIEW OF UNITED STATES PATENT
NO. 6,467,093 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42
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<tbody>
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<td>ARRIS-1001</td>
<td>U.S. Pat. No. 6,467,093 to Inoue et al. (“the ’093 patent”)</td>
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<tr>
<td>ARRIS-1002</td>
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<td>Declaration of Dr. Jeffrey Rodriguez, Ph.D.</td>
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<tr>
<td>ARRIS-1004</td>
<td>WO 1992/022983 to Browne et al. (“Browne”)</td>
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<tr>
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<td>US 5,844,636 to Joseph et al. (“Joseph”)</td>
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<td>ARRIS-1007</td>
<td>Curriculum Vitae of Dr. Jeffrey Rodriguez, Ph.D.</td>
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<tr>
<td>ARRIS-1009</td>
<td>ISO/IEC 11172-2:1993, MPEG-1 Video</td>
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<td>US 6,369,855 to Chauvel et al.</td>
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<td>ARRIS-1021</td>
<td>EP 0784401 to Hirota et al</td>
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</table>
I. INTRODUCTION


II. REQUIREMENTS FOR IPR

A. Grounds for Standing

Petitioners certify that the ’093 patent is available for IPR. This petition is within one year of service (4/17/2017) of a complaint against Petitioners. Sony previously asserted the ’093 patent against Pace Americas, LLC and Pace plc in the District of Delaware, Civil Action No. 15-288-SLR-SRF.¹ But Sony voluntarily dismissed the ’093 patent from that case without prejudice. See ARRIS-1017. Thus, the Delaware action does not create a time bar against

¹ Petitioners have since acquired these Pace entities with Pace Americas, LLC merging into ARRIS Solutions, Inc. and Pace plc merging into ARRIS Global Ltd.
Petitioners’ ability to pursue IPR of the ’093 patent. See, e.g., Macauto U.S.A. v. BOS GmbH & KG, IPR2012-00004, Paper 18 at 14-16 (PTAB Jan. 24, 2013) (finding that the one-year IPR bar was not triggered by the original, dismissed complaint where a lawsuit was re-filed months after being dismissed without prejudice); Graves v. Principi, 294 F.3d 1350, 1356 (Fed. Cir. 2002) (“The dismissal of an action without prejudice leaves the parties as though the action had never been brought”). Thus, Petitioners are not barred or estopped from requesting review of the Challenged Claims.

**B. Challenge and Relief Requested**

Petitioners request cancellation of claims 1, 3, and 8 of the ’093 patent on the grounds in the table below, as explained here and in ARRIS-1003, Declaration of Dr. Rodriguez.

<table>
<thead>
<tr>
<th>Ground</th>
<th>’093 Claims</th>
<th>Basis</th>
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<tbody>
<tr>
<td>1</td>
<td>1 and 8</td>
<td>Anticipated by Browne</td>
</tr>
<tr>
<td>2</td>
<td>1, 3, and 8</td>
<td>Obvious over Browne and Joseph</td>
</tr>
<tr>
<td>3</td>
<td>1 and 8</td>
<td>Obvious over Browne and Hoffman</td>
</tr>
<tr>
<td>4</td>
<td>1, 3, and 8</td>
<td>Obvious over Browne, Joseph, and Hoffman</td>
</tr>
</tbody>
</table>
The ’093 patent was filed February 3, 1999, and claims priority to Japanese Application 10-023340, filed February 4, 1998 (‘Critical Date’). Even if the ’093 patent is entitled to claim priority to the Critical Date, each reference relied herein qualifies as prior art:

<table>
<thead>
<tr>
<th>Reference</th>
<th>Date</th>
<th>Section</th>
</tr>
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<tbody>
<tr>
<td>Browne</td>
<td>Dec. 23, 1992 (published)</td>
<td>102(b)</td>
</tr>
<tr>
<td>Joseph</td>
<td>Dec. 1, 1998 (issued)</td>
<td>102(e)</td>
</tr>
<tr>
<td></td>
<td>May 13, 1997 (filed)</td>
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<tr>
<td>Hoffman</td>
<td>1995 (published)</td>
<td>102(b)</td>
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III. BACKGROUND

A. Overview of the ’093 Patent

The ’093 patent describes a system that supplies digital signals in a variety of formats to accommodate different types of external units. ARRIS-1001, 1:7-9. Although different from today’s set top box technology, which attempts to minimize (and simplify) the output from a set top box for simplicity, such techniques were well known in the art prior to the filing of the ’093 patent.

The ’093 patent begins by framing the problem it is attempting to address: systems could receive digital broadcast signals, but could not output them to all
types of external units. According to the background, systems existed for the receipt and processing of digital broadcast signals. ARRIS-1001, 1:18-31. These systems would use a “digital interface” to output received signals to external units. ARRIS-1001, 1:32-42. The output signals were most commonly in the form of compressed data. ARRIS-1001, 1:33-38; 1:44-2:14. As one example, prior art systems would receive, and output, “signals representing a plurality of television programs compressed according to…the Moving Picture Experts Group (MPEG) method.” ARRIS-1001, 1:11-23. But the ability to only output one format of data (e.g., compressed MPEG data) was a device limitation. For example, if a recording apparatus for a magneto-optical disc did not support the MPEG compression format, a receiving device only capable of an MPEG compressed data output could not use that recording apparatus. Id. at 1:61-2:9; 1:44-51 (because the output is compressed, “it is impossible to record and reproduce broadcast program signals output through the digital interface by using only an apparatus that is not provided with a compression/decompression function compatible with a compression method used in digital broadcasting.”).

To address this, the ’093 patent proposed supplying compressed output or decompressed output, depending upon the type of external unit connected to the system of the ’093 patent. ARRIS-1001, 2:17-39. As the ’093 patent explains, “[t]his makes it possible to receive digital broadcasts in which data is compressed
and to directly supply the compressed data of a target broadcast program to the
digital external unit, or to supply the decompressed data of a target broadcast
program to the digital external unit.” ARRIS-1001, 2:40-44. With this ability, “it
is possible to supply the decompressed data even to a digital external unit which is
not provided with a decompression function compatible with the data

This alleged novelty is illustrated in FIG. 1 of the ’093 patent, below. The
digital interface 20 receives compressed MPEG broadcast data from descrambler
131 and receives decompressed data from MPEG decoder 141. ARRIS-1001,
6:11-14, 9:10-10:11. In turn, it outputs (through terminal 20T) either the
compressed MPEG broadcast data or the decompressed data, depending upon a
selection from the user. Id.
For example, as shown in FIG. 6 of the ’093 patent (below), a controller 30 “determines which type of digital external unit has been selected.” ARRIS-1001, 12:21-58. If the user has selected the DVTR or AVHDD, the controller 30 controls the digital interface 20 to output compressed MPEG data. ARRIS-1001, 12:59-67. If the user has selected the MD unit, the controller 30 controls the digital interface 20 to output decoded data. ARRIS-1001, 13:1-5.
The '093 patent goes on to describe that either compressed or decompressed output may be provided to the same input/output terminal. ARRIS-1001, 17:7-53. In this case, “the user may select the transport stream or the digital audio signal to be output.” *Id.*
B. Review of Prosecution History and Reasons for Allowance

The ’093 patent was filed on February 3, 1999 and claims priority to Japanese patent application 10-023340, filed February 4, 1998. ARRIS-1001.

On December 19, 2001, the Examiner rejected the pending claims as obvious under 35 U.S.C. § 103. ARRIS-1002, 171. In response, Applicant argued that none of the references relied upon by the Examiner taught “a digital interface means for receiving compressed data and decompressed data.” Id., 186 (emphasis original).

On June 17, 2002, the Examiner issued a Notice of Allowance. As the reasons for allowance, the Examiner explained that none of the prior art references disclosed the feature of “receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and for outputting each of the compressed data and the decompressed data to a digital external unit.” ARRIS-1002, 190 (emphasis added).

The ’093 patent was subsequently issued on October 15, 2002. ARRIS-1001.
C. Prior Art

As set forth in this Petition, multiple prior art references, either alone or in combination, disclose all elements of the challenged claims of the ’093 patent and render these claims unpatentable. Indeed, Browne, which was not considered by the Examiner, discloses the very features that the Examiner cited as justifying allowance of the ’093 patent and establishes the primary basis for the challenges advanced in this Petition.

a. Browne’s Disclosure of Selecting Compressed or Decompressed Output

Browne, which published more than seven years prior to the earliest priority date of the ’093 patent, disclosed a system that output both compressed and decompressed data, as described in the ’093 patent. At a high level, Browne describes a system that “receives a plurality of transmission signals each containing program information” and stores those signals. ARRIS-1004, Abstract. Those received signals include compressed digital signals. ARRIS-1004, 6. Browne describes how a user can route the received input to various selected outputs. ARRIS-1004, 16, 22, FIG. 7.

Browne’s system supports a variety of formats. As illustrated in FIG. 1 (below), Browne’s system receives various types of broadcast signals, including “signal[s] 101a-101f from air and ground based broadcast sources” and
“compressed digital signals 101g and 101h.” ARRIS-1004, 6. Browne’s system additionally sends out “decompressed digital data” and “compressed program data” using digital outputs 112g and 112h, respectively. ARRIS-1004, 6, 16.

ARRIS-1004, FIG. 1 (annotated).

Browne’s system gives users full control over the format of system input and output signals. ARRIS-1004, 16, 22, 27, 33. For example, as shown in FIG. 7 (below), the user selects from a plurality of inputs, which include compressed digital broadcast signals. See id., 23; 6 (“...the multi-source recorder player 100 can preferably receive and process compressed digital signals 101g and 101h”). The user also selects where to output the data—whether it be “decompressed digital data...to a digital television receiver” or “compressed program data...to any receiver with decompression circuitry.” Id., 16; 27 (“Output selection is not
limited to 112a-112c, but may be any of the outputs 112a-112h of the multi-source recorder player 100.”).

ARRIS-1004, FIG. 7.

Thus, Browne discloses receiving compressed digital broadcast signals and selects, based on user instruction, whether to output the compressed digital broadcast signals as compressed or decompressed digital data. ARRIS-1004, 22, 27. The portion of Browne interfacing with its digital outputs 112g and 112h serves as a digital interface for outputting this data. ARRIS-1004, 16; ARRIS-1003, ¶¶24-26, 63-67. With this functionality, Browne’s digital interface operates in a similar manner to the digital interface of the ’093 patent, disclosing the very
b. Joseph’s Disclosure of After-Arising MPEG Technology

Browne clearly discloses receiving and processing compressed digital signals, including “high information content signals such as high definition television (HDTV) signals and improved definition television (IDTV).” ARRIS-1004, 11. Although Browne does not explicitly mention MPEG signals, which were not in wide use in television broadcasting at the time of Browne, a multitude of references after Browne (but before the ’093 patent) make clear that the type of compressed signals contemplated in Browne would indeed have been MPEG signals. ARRIS-1003, ¶¶29-30 (citing ARRIS-1009 and ARRIS-1010).

As one example, Joseph explains that digital broadcast signals, such as those disclosed by Browne, would have been compressed according to the MPEG standard. See ARRIS-1005, 1:8-56 (in describing packetized transmissions, including digital broadcast satellite data, “compression and decompression of packetized video and audio signals may be accomplished according to the Motion Picture Expert Group (MPEG) standard”). Thus, even if Browne is viewed as not disclosing MPEG, a person of ordinary skill in the art as of the Critical Date (hereinafter, “POSITA”) would have found it obvious to modify Browne in view
of after-arising MPEG technology, such as Joseph, to implement Browne using MPEG broadcast signals that Browne’s system would receive, decode, store, and output as either compressed or decompressed data. ARRIS-1003, ¶¶29-30, 82-88. Accordingly, Joseph has been cited in Grounds 2 and 4 to provide details of the after-arising MPEG technology that a POSITA would have found obvious to add to Browne.

**c. Hoffman’s Disclosure of After-Arising IEEE 1394 Interface**

The ’093 patent describes outputting both compressed and decompressed data through a digital interface embodied by the prevalent interface of the day—a standard IEEE 1394 interface. ARRIS-1001, 9:22-30. As with MPEG technology, IEEE 1394 interfaces did not exist in the early 90’s when Browne was written. ARRIS-1003, ¶¶31-32, 106 (citing ARRIS-1011, 75). However, as further explained in this petition, a POSITA would have found it obvious to modify Browne in view of after-arising IEEE 1394 technology to implement the multiple output ports of Browne, which output both compressed and decompressed digital signals, using an IEEE 1394 digital interface. ARRIS-1003, ¶¶106-116.

For example, Hoffman, which was not considered by the Examiner during prosecution, recognizes that existing devices (such as Browne) “requir[e] a great deal of space for the connectors” and that “the growing number of cables overwhelms many users.” ARRIS-1006, 334. Hoffman proposes using IEEE 1394
technology to solve this problem, explaining that “[t]he IEEE 1394 high-speed serial bus” improves transmission of digital data “for professional and consumer electronics products.” Id., Abstract. With this motivation to employ IEEE 1394 interfaces, a POSITA would have found it obvious to modify Browne in view of after-arising IEEE 1394 technology to implement the multiple output ports in Browne as an IEEE 1394 interface, which would provide increased flexibility and performance in a smaller package. ARRIS-1003, ¶¶32, 106-116. Thus, to the extent Patent Owner argues that Browne’s interface with its digital outputs 112g and 112h does not constitute a “digital interface,” Hoffman has been included in Grounds 3 and 4 to demonstrate how a POSITA would have found it obvious to implement Browne’s interface to digital outputs 112g and 112h as an IEEE 1394 interface—the very same digital interface the ’093 patent discloses.

IV. CLAIM CONSTRUCTION UNDER 37 C.F.R. §§ 42.104(B)(3)

Petitioners submit constructions for the below terms. In construing these phrases, Petitioners have employed the broadest reasonable interpretation.² All remaining terms should be given their broadest reasonable ordinary meaning.

² The standard for district court (“ordinary and customary meaning”) is different than the BRI standard applied in IPR. Due to these differences, the disclosure
Petitioners note that in the prior case involving the ’093 patent where Sony voluntarily dismissed the infringement claims (hereinafter, “Sony’s Voluntarily Dismissed Case”), the parties and/or the Court provided constructions for certain of the below terms, and the Court issued a Markman order. Sony has dismissed the ’093 patent from that case, thus, those constructions no longer have force.\textsuperscript{3} \textit{Graves v. Principi}, 294 F.3d 1350, 1356 (Fed. Cir. 2002) ("The dismissal of an action without prejudice leaves the parties as though the action had never been brought"); \textit{Bonneville Associates, Ltd. Partnership v. Baram}, 165 F.3d 1360, 1364 (Fed. Cir.)

identified by Petitioner as teaching terms of the ’093 patent is not an admission that the terms are met by any disclosure for infringement purposes or that the terms meet the standards for definiteness or written description. For the means-plus-function limitations, Petitioners have applied the BRI standard in mapping structure in the ’093 patent specification to the claimed functions and reserve the right to advance narrower interpretations under the ordinary and customary meaning standard.

\textsuperscript{3} Confirming this point is the fact that Sony continues to assert its patents against Respondents in the International Trade Commission, but does not itself apply the Court’s (now defunct) constructions from the District of Delaware.
1999) (“The rule in the federal courts is that ‘[t]he effect of a voluntary dismissal
without prejudice pursuant to Rule 41(a) is to render the proceedings a nullity and
leave the parties as if the action had never been brought.’”) (citations and internal
quotes omitted.) Nonetheless, Petitioners have considered those existing
constructions herein, but diverge from them where the prior constructions are not
consistent with the broadest reasonable interpretation of the term.

“broadcast program extraction means for extracting from said
broadcast program signals compressed data including a broadcast program
selected and specified by a user”

The “broadcast program extraction means” in claim 1 is governed by 35
U.S.C. §112 ¶6. It recites “means for,” which creates a presumption that the term
is governed by §112 ¶6, and no other limitations in claim 1 inform a POSITA at
the Critical Date as to the structure of the limitation. Williamson v. Citrix Online,
Accordingly, “broadcast program extraction means” should be construed to cover
the corresponding structure described in the specification as performing the recited
function, and equivalents thereof. Williamson, 2015 WL 3687459, *9, 14. Here,
the recited function is “extracting from said broadcast program signals compressed
data including a broadcast program selected and specified by a user,” and the
The corresponding structure for performing that function is a demodulator, by itself, or with a demultiplexer. ARRIS-1003, ¶¶39-41.

Under BRI, the function does not need construction. The analysis thus turns to the identification of corresponding structure. The ’093 patent starts by equating the claimed “extraction” process (“extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user”) with “demodulating.” ARRIS-1001, 5:62-67 (“In receiving apparatuses constructed in accordance with the embodiments described below, signals containing a plurality of multiplexed broadcast programs on a single carrier can be received and demodulated to extract a signal of a target broadcast program.”); 6:11-20 (“The received-signal processor 10, which includes a tuner 11, a front end unit 12, a transport unit 13, and a decoding unit 14, outputs a broadcast program selected by the user by executing processing, such as demodulating a received and selected carrier.”). The minimum structure disclosed for performing this demodulation in the ’093 patent is “a demodulator.” ARRIS-1001, 7:1-4; ARRIS-1003, ¶¶39-41.

In Sony’s Voluntarily Dismissed Case, “broadcast extraction means...” was construed to include use of a demultiplexer. ARRIS-1008, 12 n.22. However, such construction is not consistent with BRI as further discussed below. And because the patents were dismissed from that case, that construction is not binding,
nor is it even appropriate here. A “demultiplexer” is useful only where multiple program signals are multiplexed on a single carrier. ARRIS-1003, ¶40. While the specification does discuss the use of a demultiplexer with certain transport streams, claim 1 has no requirement. In fact, the ’093 patent invokes the “present invention” language to establish the opposite—the system can receive a “single broadcast program on a single carrier” (rendering a “demultiplexer” unnecessary):

The present invention is, however, applicable to a digital broadcast in which a single broadcast program signal is carried on a single carrier. More specifically, a single broadcast program signal carried on a single carrier may be received and demodulated. Then, the demodulated signal and a signal obtained by decompressing this demodulated signal may be supplied to the digital interface and be output to the external unit according to the user's instruction.

ARRIS-1001, 18:2-11. In other words, the demultiplexer is not required and the demodulator alone is the structure that performs the function of “extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user.” ARRIS-1003, ¶¶39-41.

For the reasons discussed above, under the broadest reasonable interpretation standard, a POSITA would have viewed the ’093 patent’s description

Thus, “broadcast program extraction means” should be construed to require the function of “extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user” performed by the structure of a demodulator, a demodulator with a demultiplexer, or equivalents thereof. ARRIS-1003, ¶¶39-41.

“decompression means for decompressing the compressed data extracted by said broadcast program extraction means and for outputting decompressed data”

The “decompression means” of claim 1 is governed by 35 U.S.C. §112 ¶6. It recites “means for,” which creates a presumption that the term is governed by §112 ¶6, and no other limitation in claim 1 informs a POSITA as to the structure of the limitation. Williamson v. Citrix Online, LLC, 2015 WL 3687459, *5-6 (Fed. Cir. 2015) (en banc); ARRIS-1003, ¶¶42-45. Accordingly, “decompression means” should be construed to cover the corresponding structure described in the specification as performing the recited function, and equivalents thereof.
Williamson, 2015 WL 3687459, *9, 14. Here, the recited function is “decompressing the compressed data extracted by said broadcast program extraction means and…outputting decompressed data,” and the corresponding structure is a decoder.

Under BRI, the function does not need construction. The ’093 patent describes several different types of “decoders” that perform the claimed function (“decompressing the compressed data extracted by said broadcast program extraction means and for outputting decompressed data”). ARRIS-1003, ¶43.

For example, the ’093 patent states that “the MPEG decoder 141 decompresses the MPEG-compressed video signal and the MPEG-compressed audio signal supplied from the demultiplexer 132.” ARRIS-1001, 8:51-56. As another example from the ’093 patent, “[t]o reproduce ATRAC-compressed audio signals, an ATRAC decoder, which is a decompression function for decompressing ATRAC-compressed audio signals, may be provided for the decoding unit 14 of the receiving apparatus 3.” ARRIS-1001, 14:45-51. Further, the ’093 patent describes examples where “[t]he digital interface 20 is provided with a decompression function of decompressing” or decompression is performed by “a software decoder.” ARRIS-1001, 14:4-39.

With these various examples, a POSITA would not have seen the ’093 patent as necessarily limiting the structure for decompressing to any particular type
of decoder. ARRIS-1003, ¶¶43-44. Accordingly, under the broadest reasonable interpretation standard, a POSITA would have viewed the ’093 patent’s description of “a decoder” as a reasonable mapping to the structure for performing the function of “decompressing the compressed data extracted by said broadcast program extraction means and...outputting decompressed data.” ARRIS-1001, 8:51-56, 14:4-51; ARRIS-1003, ¶¶42-45.

In Sony’s Voluntarily Dismissed Case, the Court identified an MPEG decoder, and its equivalents, as structure corresponding to the claimed function. ARRIS-1008, 10-11. Because the patents were dismissed from that case, that construction is not binding. Nor is it appropriate, because an “MPEG decoder” would not include other specific examples of decoders disclosed in the specification, such as the “ATRAC decoder.” ARRIS-1001, 14:33-54 (describing ATRAC decoding); see also Oatey Co. v. IPS Corp., 514 F.3d 1271, 1276–77 (Fed. Cir. 2008) (“We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification.”) (citing Verizon Servs. Corp. v. Vonage Holdings Corp., 503 F.3d 1295, 1305 (Fed.Cir.2007) (rejecting proposed claim interpretation that would exclude disclosed examples in the specification); Invitrogen Corp. v. Biocrest Mfg., L.P., 327 F.3d 1364, 1369 (Fed.Cir.2003) (finding district court's claim construction erroneously excluded an embodiment described in an example in the specification, where the prosecution history showed
no such disavowal of claim scope); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed.Cir.1996) (finding that a claim interpretation that excludes a preferred embodiment is “rarely, if ever, correct”).

Thus, “decompression means” should be construed to require the function of “decompressing the compressed data extracted by said broadcast program extraction means and...outputting decompressed data” performed by the structure of “a decoder,” or equivalents thereof. ARRIS-1003, ¶¶42-45.

“digital interface means for receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and for outputting each of the compressed data and the decompressed data to a digital external unit”

The “digital interface means” in claim 1 is governed by 35 U.S.C. §112 ¶6. It recites “means for,” which creates a presumption that the term is governed by §112 ¶6, and no other limitation in claim 1 informs a POSITA as to the structure of the limitation. *Williamson v. Citrix Online, LLC*, 2015 WL 3687459, *5-6 (Fed. Cir. 2015) (en banc); ARRIS-1003, ¶¶46-48. Here, the recited function is “receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and...outputting each of the compressed data and the decompressed data to a
digital external unit,” and the corresponding structure is a “digital interface.”

Under BRI, the function does not need construction. The inquiry thus focuses on the disclosed structure for performing the recited function. The ’093 patent recites a single “structure” for this function: a “digital interface.” For example, the ’093 patent describes “a digital interface 20 through which digital data is supplied to…digital external units.” ARRIS-1001, 6:11-15. The ’093 patent also states that “[s]upplied to the digital interface 20 are…an MPEG-compressed video signal and an MPEG-compressed audio signal of a plurality of broadcast programs supplied from the descrambler 31, and a digital audio signal of a single broadcast program separated and extracted from the transport stream by the demultiplexer 132 and decompressed by the MPEG decoder 141.” ARRIS-1001, 9:31-39. “The digital interface 20…outputs either the transport stream or the digital audio signal to the external unit.” ARRIS-1001, 9:39-45.

From this description, under the broadest reasonable interpretation standard, a POSITA would have viewed the ’093 patent’s description of “a digital interface” as a reasonable mapping to the structure for performing the function of receiving compressed and decompressed data and outputting each of the compressed and decompressed data to a digital external unit. ARRIS-1001, 6:11-15, 9:31-45, FIGS. 1, 4-5; ARRIS-1003, ¶47. Indeed, in Sony’s Voluntarily Dismissed Case,
the Court identified a digital interface, and its equivalents, as structure
corresponding to the claimed function. ARRIS-1008, 11-13. Thus, “digital
interface means” should be construed to require the function of “receiving the
compressed data extracted by said broadcast program extraction means and the
decompressed data from said decompression means, and…outputting each of the
compressed data and the decompressed data to a digital external unit” performed
by the structure of “a digital interface,” or equivalents thereof. ARRIS-1003, ¶¶46-
48.

“control means for controlling, based on an instruction from the user,
the selection of an output from said digital interface means to said digital
external unit”

The “control means” in claim 1 is governed by 35 U.S.C. §112 ¶6. It recites
“means for,” which creates a presumption that the term is governed by §112 ¶6,
and no other limitation in claim 1 informs a POSITA as to the structure of the
2015) (en banc); ARRIS-1003, ¶¶49-51. Here, the recited function is “controlling,
based on an instruction from the user, the selection of an output from said digital
interface means to said digital external unit,” and the corresponding structure is a
“controller.” ARRIS-1003, ¶¶49-51.
Under BRI, the function does not need construction. The minimum structure the ’093 discloses for performing that function (“controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit”) is a “controller.” For example, the ’093 patent describes in multiple places that the controller selects the data that is output to the external unit:

- “The digital interface supplies either of the transport stream or the decompressed data to a digital external unit under the control of the controller.” ARRIS-1001, Abstract
- “Upon receiving the command information for specifying the external unit, the controller 30…controls the digital interface 20 in response to the command signal to supply the digital data in accordance with the selected digital external unit.” ARRIS-1001, 9:54-64
- “[T]he controller 30 controls the digital interface 20 to output the transport stream” or “the controller 30 controls the digital interface 20 to output the MPEG-decoded digital audio signal of a single broadcast program from the MPEG decoder 141.” ARRIS-1001, 12:33-13:14.

See also ARRIS-1001, 11:33-38.
From this description, under the broadest reasonable interpretation standard, a POSITA would have viewed the ’093 patent’s description of “a controller” as mapping to the structure for performing the function of controlling the selection of a desired output. ARRIS-1001, Abstract, 9:54-64, 11:33-38, 12:33-13:14; ARRIS-1003, ¶50.

Moreover, to the extent Patent Owner argues that the ’093 patent’s controller is a general purpose computer, a reasonable construction (under BRI) simply requires the structure of the controller without the need for a corresponding algorithm to produce a special purpose computer. *See In re Katz Interactive Call Processing Patent Litigation*, 639 F.3d 1303, 1316, 97 USPQ2d 1737, 1747 (Fed. Cir. 2011). Thus, requiring a corresponding algorithm is unnecessary and inconsistent with the *broadest* reasonable interpretation.

In Sony’s Voluntarily Dismissed Case, the Court identified a specific algorithm from the specification as structure corresponding to the claimed function. ARRIS-1008, 13-14. That algorithm included, for example, that the system display available external units (ARRIS-1001, 12:49-54), that the system determines the type of output signal based on the external unit selected from a GUI listing possible external units (ARRIS-1001, 12:57-58), and based on that, the system utilize the appropriate type of output signal. ARRIS-1001, 12:59-13:11. Sony interprets this algorithm to be satisfied by a system that it alleges can simply
output compressed and decompressed data – and ignores the steps from the specification requiring the selection of the external unit, from a GUI display, and the identification and use of an output signal based on the selected external unit. See ARRIS-1016, 10-12 (alleging the accused product infringes because it “includes a processor and memory for controlling, based on an instruction from a user, the selection of [decompressed] or [compressed] audio output....”). To the extent the outputting of compressed and decompressed data by itself, based upon some selection from the user, satisfies this limitation (as Sony contends in the ITC), the structure for performing that bare function is a “controller.”

For the above reasons, “control means” should be construed to require the function of “controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit” performed by the structure of “a controller,” or equivalents thereof. ARRIS-1003, ¶¶49-51.
V. APPLICATION OF PRIOR ART TO CHALLENGED CLAIMS

As detailed above (incorporated herein) and below, this request shows a reasonable likelihood that Petitioners will prevail on the Challenged Claims.

A. [GROUND 1] Browne Anticipates Claims 1 and 8 under §102(b)

[1a] “A digital broadcast receiving apparatus for receiving broadcast program signals, comprising;”

To the extent the preamble is limiting, Browne discloses a digital broadcast receiving apparatus, “multi-source recorder player 100,” that receives broadcast program signals. ARRIS-1004, 6. For example, Browne’s multi-source recorder player 100 has “multiple input connections, each of which may receive an input signal 101a-101f from air and ground based broadcast sources, cable feeds, or digital distribution sources.” Id. In Browne, “a plurality of cable television input signals may be received simultaneously by the multi-source recorder player 100.” ARRIS-1004, 9. Additionally, “the multi-source recorder player 100 may receive digital ISDN data as input signal 101g, which is digitally modulated and distributed in a compressed format.” ARRIS-1004, 11.

By teaching a multi-source recorder player 100 that receives various air and ground based broadcast signals, Browne discloses “[a] digital broadcast receiving apparatus for receiving broadcast program signals.” ARRIS-1003, ¶¶54-55.
“broadcast program extraction means for extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user;”

As discussed at Section IV, under the BRI standard, “broadcast program extraction means” should be construed to require the function of “extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user” performed by the structure of a demodulator, a demodulator with demultiplexer, or equivalents thereof. ARRIS-1003, ¶39.

Browne anticipates this feature because Browne discloses the claimed function performed by the structure of a demodulator. ARRIS-1003, ¶¶56-59.

Specifically, Browne discloses that “the multi-source recorder player 100 can preferably receive and process compressed digital signals 10lg and 10lh.” ARRIS-1004, 6. Such signals include “digital ISDN data...which is digitally modulated and distributed in a compressed format.” ARRIS-1004, 11; see also ARRIS-1003, ¶57 (citing to ARRIS-1018, 1:6-8 and ARRIS-1019, 64).

Browne further discloses extracting compressed data including a broadcast program from such received compressed digital signals. ARRIS-1003, ¶¶57-58. For example, Browne discloses “demodulator means for separately extracting the video and audio signals from each of the received transmission signals.” ARRIS-1004, Claim 23. In particular, as shown in FIG. 10 (below), Browne’s player 100
includes a demodulator 113g that extracts compressed video and audio signals from compressed digital input signal 101g. ARRIS-1004, 10.

ARRIS-1004, FIG. 1 (annotated).

The extracted compressed data in Browne is selected and specified by a user. ARRIS-1003, ¶58. Indeed, Browne’s system is “controlled by user input to allow for automatic recording of selected programs.” ARRIS-1004, Abstract. As further shown in FIGS. 5A-5C (below), Browne prompts the user to select and specify the desired broadcast program for viewing/recording by, for example, allowing the user to select a channel (FIG. 5A), select a broadcast source (FIG. 5B), and/or enter the desired program title directly (FIG. 5C). ARRIS-1004, 23.
ARRIS-1004, FIGS. 5A-5C.

Because Browne discloses the structure of demodulator 113g that extracts, from the broadcast program signals, compressed data including a broadcast program selected and specified by a user, Browne discloses the claimed function performed by the construed structure of a demodulator, a demodulator with demultiplexer, or an equivalent thereof. ARRIS-1003, ¶¶56-59. Thus, Browne teaches “broadcast program extraction means for extracting from said broadcast program signals compressed data including a broadcast program selected and specified by a user.” *Id.*
“decompression means for decompressing the compressed data extracted by said broadcast program extraction means and for outputting decompressed data;”

As discussed at Section IV, under the BRI standard, “decompression means” should be construed to require the function of “decompressing the compressed data extracted by said broadcast program extraction means and...outputting decompressed data” performed by the structure of “a decoder,” or equivalents thereof. ARRIS-1003, ¶42. Browne anticipates this feature because Browne discloses the claimed function performed by the structure of a decompressor, which serves as a decoder or at least is equivalent to a decoder. ARRIS-1003, ¶¶60-62.

Specifically, Browne discloses a decompressor 106, or a decoder, that performs the function of decompressing the compressed data extracted by said broadcast program extraction means and outputting decompressed data. ARRIS-1003, ¶61. As shown in FIG. 1 (below), a decompressor, for example decompressor 106d, receives the extracted compressed data from “input signal 101g, which is...distributed in a compressed format.” ARRIS-1004, 16. Following decompression of the received compressed data, “[t]he decompressed data from [decompressor 106d] is input to the digital crosspoint 107.” Id., 14
Because Browne discloses a decompressor 106d that receives compressed data from a broadcast signal and outputs it in decompressed format, Browne discloses the claimed function performed by the construed structure of a decoder or an equivalent thereof. ARRIS-1003, ¶¶60-62. Thus, Browne teaches “decompression means for decompressing the compressed data extracted by said broadcast program extraction means and for outputting decompressed data.” Id.
“digital interface means for receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and for outputting each of the compressed data and the decompressed data to a digital external unit; and”

As discussed at Section IV, under the BRI standard, “digital interface means” should be construed to require the function of “receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and…outputting each of the compressed data and the decompressed data to a digital external unit” performed by the structure of “a digital interface,” or equivalents thereof. ARRIS-1003, ¶46. Browne anticipates this feature because Browne discloses the claimed function performed by the structure of a digital interface (or at least structure equivalent to a digital interface). ARRIS-1003, ¶¶63-67.

Specifically, as shown in FIG. 1 (below), Browne includes “two digital outputs 112g and 112h.” ARRIS-1004, 16. Here, “[o]utput 112g may be used for sending decompressed digital data, for example, to a digital television receiver,” and “[o]utput 112h may be used to output modulated or non-modulated compressed program data, for example, to a remote location via common carrier channels, such as the telephone or ISDN networks, or to any receiver with decompression circuitry.” Id. As shown in FIG. 1 (below), Browne’s digital
interface (the boxed region) includes circuitry that interfaces between the demodulator 113g/mixer 108c and digital external receivers that would connect to outputs 112g/112h. ARRIS-1003, ¶¶64-66. With this structure, Browne’s digital interface (the boxed region) receives the compressed data extracted by the broadcast program extraction means (demodulator 113g) and the decompressed data from the decompression means (decompressor 106 through crosspoint 107 and mixer 108), and then outputs each of the compressed data and the decompressed data to an external unit, such as a digital television receiver or any external unit capable of decompressing compressed data. See ARRIS-1004, 16.

ARRIS-1004, FIG. 1 (annotated).
Notably, Browne’s system “allow[s] any source to be connected to any
destination.” ARRIS-1004, 16. Specifically, “the user first selects the output to
which the signals are to be sent” and “[t]he user then selects…the types of signals
which will be output by the output selected.” Id., 27. As such, Browne’s “multi-
source recorder player…can receive a plurality of different types of input
signals...and can output the signals to one or more receivers.” Id., 33.

With this structure, Browne’s digital interface (i.e., boxed region in
annotated FIG. 1 above) receives compressed data extracted by demodulator 113g
(e.g., red path in FIG. 1 above) when the user selects output 112h to output signals
from input 101g. ARRIS-1003, ¶¶64-66. Browne’s digital interface also receives
decompressed data from decompressor 106d (e.g., purple path in annotated FIG. 1
above) when the user selects output 112g to output signals from input 101g. Id.

Accordingly, Browne’s digital interface (i.e., structure of Browne’s player
100 that interfaces with digital outputs 112g and 112h) outputs each of the
compressed data and the decompressed data to a digital external unit. ARRIS-
1003, ¶65. For example, Browne’s digital interface outputs the compressed data to
a digital external unit connected to digital output 112h (e.g., “any receiver with
decompression circuitry”) when the user selects output 112h. ARRIS-1004, 16.
And, Browne’s digital interface outputs the decompressed data to a digital external
unit connected to digital output 112g (e.g., “digital television receiver”) when the user selects output 112g. Id.

Accordingly, Browne discloses the claimed function performed by the construed structure of a digital interface or an equivalent thereof. ARRIS-1003, ¶¶63-67. Thus, Browne discloses “digital interface means for receiving the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means, and for outputting each of the compressed data and the decompressed data to a digital external unit.” Id.

[1e] “control means for controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit, said output being selected from the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means.”

As discussed at Section IV, under the BRI standard, “control means” should be construed to require the function of “controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit” performed by the structure of “a controller,” or equivalents thereof. ARRIS-1003, ¶¶49. Browne anticipates this feature because Browne discloses the claimed function performed by the structure of a controller. ARRIS-1003, ¶¶68-74.
Specifically, Browne discloses a controller 105 that generates a routing controller screen 700 that allows the user to choose the type of input (e.g., compressed or decompressed) and the type of output (e.g., compressed or decompressed). For example, as illustrated in FIG. 7 (below), Browne describes that, “[w]hen the routing controller screen 700 appears, the user first selects the output to which the signals are to be sent…from the output selection 701.”

ARRIS-1004, 22. Browne confirms that “[o]utput selection is not limited to outputs 112a-112c [shown in FIG. 7], but may be any of the outputs 112a-112h of the multi-source recorder player 100,” which include digital outputs 112g and 112h. *Id.* Subsequently, “[t]he user then selects from the signal selection section 702 the types of signals which will be output by the output selected from output selection 701.” *Id.* That is, Browne’s system “allow[s] any source to be connected to any destination.” *Id.*, 16. Specifically, “the user first selects the output to which the signals are to be sent” and “[t]he user then selects...the types of signals which will be output by the output selected.” *Id.*, 27.

Browne also describes user selection of input and output ports through “remote control panel 1400” using “[t]he source and output buttons 1401 and 1402…to arrange program routing.” *Id.*, 33. With these multiple options for user selection of program routing, Browne’s “multi-source recorder player…can receive a plurality of different types of input signals” and provides the user with “a great
deal of control over the signals that are input and…output…to one or more receivers.” *Id.*

![FIG. 7](image)

ARRIS-1004, FIG. 7 (annotated).

Through the selection shown in FIG. 7 and described above, Browne enables a user to provide instructions selecting whether the signals from input 101g are output through its digital interface as compressed data extracted by demodulator 113g or decompressed data from decompressor 106d. ARRIS-1003, ¶¶69-71. Specifically, when the user selects output 112h to output signals from input 101g, Browne’s controller 105 controls its digital interface to output compressed data
extracted by demodulator 113g to the digital external unit connected to digital
output 112h. *Id.* When the user selects output 112g to output signals from input
101g, Browne’s controller 105 controls its digital interface to output decompressed
data from decompressor 106d to the digital external unit connected to digital
output 112g. *Id.*

Further, even if the digital external unit connected to digital output 112g is
different from the digital external unit connected to digital output 112h, this
selection is consistent with the ’093 patent, which describes the digital interface
outputting compressed data to devices (e.g., mini disc units) that are different than
devices (e.g., DVTRs or AVHDDs) to which the digital interface outputs

Moreover, Browne contemplates multiple outputs being connected to the
same external device. For instance, “[t]he user has a great deal of control over the
signals that are input and can output the signals to one or more receivers.”
ARRIS-1004, 33. Browne also describes an example in which “outputs 112b and
112c are preferably connected to one or more audio/video recorders or secondary
monitors.” *Id.*, 16. Accordingly, from this disclosure, Browne contemplates a
digital external unit being connected to multiple outputs (e.g., outputs 112g and
112h) and receiving data from the multiple outputs (e.g., receiving decompressed
and compressed data from outputs 112g and 112h). ARRIS-1003, ¶73.
Further, Browne’s user selection described above is implemented by the structure of a controller 105: “[c]ontroller 105 is a microprocessor which preferably runs a user control program and allows a user to access and control the multi-source recorder player 100.” ARRIS-1004, 13. For instance, “[i]f the user chooses the routing controller option 204, the routing controller screen 700, shown in FIG. 7, is output from controller 105.” Id., 27.

Because Browne discloses controller 105 that controls, based on an instruction from the user, the selection of an output from Browne’s digital interface to digital external units with the output being selected from the compressed data and the decompressed data, Browne discloses the claimed function performed by the construed structure of a controller or an equivalent thereof. ARRIS-1003, ¶68. Thus, Browne discloses “control means for controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit, said output being selected from the compressed data extracted by said broadcast program extraction means and the decompressed data from said decompression means.” ARRIS-1003, ¶¶68-74.

[8a] “A method of receiving a digital broadcast comprising”

See Ground 1[1a]. As discussed at Ground 1[1a], Browne’s “multi-source recorder player 100” performs a method of receiving a digital broadcast by receiving, through “multiple input connections,” signals from “air and ground
based broadcast sources, cable feeds, or digital distribution sources,” including receiving “digital ISDN data as input signal 101g, which is digitally modulated and distributed in a compressed format.” ARRIS-1004, 6, 9, 11; ARRIS-1003, ¶75.

[8b] “extracting from the digital broadcast compressed data including a broadcast program selected and specified by a user;”

See Ground 1[1b]. As discussed at Ground 1[1b], Browne’s “multi-source recorder player 100” extracts, from the digital broadcast, compressed data including a broadcast program selected and specified by a user, using a demodulator to “separately extract[] the video and audio signals from each of the received transmission signals.” ARRIS-1004, Abstract, 6, 10, 11, 23, Claim 23; ARRIS-1003, ¶57. In particular, Browne’s “multi-source recorder player 100” uses a “demodulator 113g” to extract compressed video and audio signals from compressed digital input signal 101g. ARRIS-1004, Claim 23, 10; ARRIS-1003, ¶57. The extracting of compressed data in Browne is “controlled by user input to allow for automatic recording of selected programs.” ARRIS-1004, Abstract, 23; ARRIS-1003, ¶¶58, 76.

[8c] “decompressing the compressed data to form decompressed data;”

See Ground 1[1c]. As discussed at Ground 1[1c], Browne’s “multi-source recorder player 100” decompresses the compressed data to form decompressed data, through a “decompressor 106” that receives the extracted compressed data
from “input signal 101g, which is...distributed in a compressed format” and outputs the decompressed data to a “digital crosspoint 107.” ARRIS-1004, 16, 14; ARRIS-1003, ¶77.

[8d] “outputting, in a main outputting step, each of the compressed data and the decompressed data to a digital external unit; and”

See Ground 1[1d]. As discussed at Ground 1[1d], Browne’s “multi-source recorder player 100” outputs, in a main outputting step, each of the compressed data and the decompressed data to a digital external unit, for example through “two digital outputs 112g and 112h,” where output 112g “send[s] decompressed digital data…to a digital television receiver” and output 112h “output[s] modulated or non-modulated compressed program data…to any receiver with decompression circuitry.” ARRIS-1004, 14, 16, 27, 33; ARRIS-1003, ¶78.

[8e] “controlling, based on an instruction from the user, the selection of an output from said main outputting step to said digital external unit, said output being selected from the compressed data and the decompressed data.”

See Ground 1[1e]. As discussed at Ground 1[1e], Browne’s “multi-source recorder player 100” controls, based on an instruction from the user, the selection of an output from said main outputting step to said digital external unit, said output being selected from the compressed data and the decompressed data, through “a controller 105” that generates “a routing controller screen 700” that allows the user
to choose the type of output (e.g., compressed 112h or decompressed 112g).

ARRIS-1004, 13, 16, 22, 27, 33, FIG. 7; ARRIS-1003, ¶79.

**B. [GROUND 2] Browne in view of Joseph Renders Obvious Claims 1, 3, and 8 under §103**

Claim 3 of the ’093 patent recites that “the compressed data comprises data which is compressed by an MPEG method.” As discussed at Section III.C.b, although Browne clearly discloses “receiv[ing] and process[ing] compressed digital signals” including compressed “HDTV signals,” Browne does not explicitly mention MPEG compression. ARRIS-1004, 6, 12. This is not surprising because the MPEG standard was not yet in use for television broadcasting in the early 90’s when Browne was conceived. ARRIS-1003, ¶¶82-84 (citing ARRIS-1012, ARRIS-1013, ARRIS-1014, 277, FIG. 1, ARRIS-1020, 2:15-30, and ARRIS-1021, 1:6-10).

Joseph, which was filed several years after Browne, but before the ’093 patent, clearly shows the adoption of MPEG compression for television broadcasting and confirms that digital television signals, such as those disclosed by Browne, would indeed have been compressed according to the MPEG standard before the ’093 patent. See ARRIS-1005, 1:49-56. Thus, a POSITA would have found it obvious to modify Browne to use Joseph’s after-arising MPEG technology
to receive and process MPEG-compressed broadcast signals as the compressed
digital signals received through Browne’s input 101g. ARRIS-1003, ¶¶82-88.

As Dr. Rodriguez explains, the use of broadcast signals compressed using
the MPEG standard did not become widespread until after the priority date of
Browne. ARRIS-1003, ¶84 (citing ARRIS-1012, ARRIS-1013, ARRIS-1014, 277,
FIG. 1, ARRIS-1020, 2:15-30, and ARRIS-1021, 1:6-10). For example, the
MPEG-2 standard, which is widely used for terrestrial, cable, and satellite
broadcasts, was not released until 1995. Id. After adoption of the MPEG standard
for digital broadcasting, a POSITA would have found it obvious to modify Browne
and use the MPEG standard for the compressed digital broadcast signals received.
Id.; see also ARRIS-1014, 277; ARRIS-1020, 2:15-30; ARRIS-1021, 1:6-10.

Indeed, a POSITA would have reviewed the finite number of types of compression
used for digital broadcast signals in 1997 and would have found it obvious to use
the prevalent compression standard at the time; namely, MPEG. ARRIS-1003,
¶84. The ’093 patent itself describes, as background, that, “[i]n the digital
broadcast system, signals representing a plurality of television programs
compressed according to, for example, the Moving Picture Experts Group (MPEG)

With this background and in light of the well-recognized benefits of MPEG
compression, a POSITA would have found it obvious to use MPEG-compressed
signals for the satellite and/or HDTV broadcast signals in Browne. ARRIS-1003, ¶¶85-88. Indeed, a POSITA would have been motivated to incorporate Joseph’s MPEG compression into Browne, modifying Browne to include the components of Joseph needed to receive and process the MPEG-compressed signals (e.g., tuner, demodulator, transport circuit, demultiplexer, and MPEG decoder). *Id.* For example, Joseph is directed to a device for “receiving broadcast entertainment-type data, such as the packetized digital video, audio, and information data signals transmitted in a direct broadcast satellite (DBS) or digital video broadcast (DVB) system.” ARRIS-1005, 1:9-13. Browne’s system also is designed to receive “Direct Broadcast Satellite input.” ARRIS-1004, 9.

Further, Joseph, which was written after widespread adoption of the MPEG format for broadcast television, explicitly recognizes that “[t]he compression and decompression of packetized video and audio signals may be accomplished according to the Motion Picture Expert Group (MPEG) standard for performing digital video/audio compression.” ARRIS-1005, 1:49-53. Accordingly, Joseph discloses a receiver unit having “an MPEG-1 or MPEG-2 video/audio decoder in order to decompress the received compressed video/audio.” *Id.*, 1:54-56.

As Dr. Rodriguez explains, a POSITA would have recognized that the MPEG broadcast signals received via satellite, as in Joseph, would be precisely the type of compressed broadcast signals that Browne’s system would have received
after MPEG’s adoption. ARRIS-1003, ¶¶86-87. And, by extension and to enable processing of MPEG-compressed signals, a POSITA would have found it obvious to substitute the demodulator and decompressor of Browne with the components in Joseph needed to receive and process MPEG-compressed signals (e.g., tuner, demodulator, transport circuit, demultiplexer, and MPEG decoder). ARRIS-1003, ¶¶85-87.

Further, a POSITA would have found it obvious to update the system in Browne, which is designed to receive compressed broadcast signals through a direct broadcast satellite input, to accommodate the compressed format or standard in use by broadcasting sources. ARRIS-1003, ¶¶84-87. Given the limited number of broadcast compression formats available as of 1997, and further given Joseph’s explicit teaching that MPEG broadcast signals are transmitted for direct broadcast satellite applications, a POSITA would have found it obvious to use MPEG compression for the type of high definition digital signals received by Browne’s system. *Id.*

Thus, for at least these reasons, a POSITA would have found it obvious to modify Browne to use Joseph’s MPEG compression as the compressed digital input such that the compressed data in Browne comprises data which is compressed by an MPEG method. ARRIS-1003, ¶¶85-87. Accordingly, Browne
and Joseph render obvious the additional features of dependent claim 3. ARRIS-1003, ¶¶82-88.

Further, as discussed in Ground 1, Browne describes all of the features of claims 1 and 8 under the claim constructions provided in Section IV. To the extent Patent Owner argues that any of the features of claims 1 and 8 should be construed more narrowly than proposed by Petitioners (e.g., to require the MPEG technology and/or algorithms described in the ’093 patent), the above-referenced description in Browne in combination with Joseph renders these features obvious. Below, Petitioners provide additional discussion addressing features [1b]-[1e] and [8b]-[8e]. However, the above discussion of Browne in Ground 1 is relevant to Ground 2, as that discussion is incorporated in Ground 2 and renders obvious the features of claims 1 and 8 for reasons similar to those presented in Ground 1.

a. Broadcast Program Extraction – Features [1b] and [8b]

As discussed above in Ground 1[1b], Browne describes the structure of the claimed broadcast program extraction means (demodulator) as set forth in the construction provided at Section IV. Although Petitioners believe that construction is proper under the BRI standard, Petitioners acknowledge that a District Court resolved to a narrower construction of the corresponding structure. See ARRIS-1008, 11 n.20 (holding that the associated structure includes “a tuner, front-end unit, and demultiplexer.”).
To the extent Patent Owner argues for a narrower mapping of the corresponding structure that requires one or more of additional structures cited in the District Court’s construction (i.e., a tuner, a front-end unit, or a demultiplexer), Joseph describes such structures. ARRIS-1003, ¶¶89-105. And, for the reasons discussed above at Section V.B, a POSITA would have found it obvious to include such structures in Browne’s system to implement the MPEG technology disclosed by Joseph. ARRIS-1003, ¶¶82-88.

Specifically, Joseph discloses a receiver unit that “includes a tuner 52.” ARRIS-1005, 7:10-14, FIGS. 4 and 7. Joseph’s tuner 52 receives MPEG broadcast signals. Id.; ARRIS-1003, ¶91.

Joseph also describes “[f]ront-end circuitry” that “receives the L-band RF signals...and converts them back into the original digital data stream,” including demodulator 54. ARRIS-1005, 6:43-45, FIG. 4. In some cases, “the demodulator and FEC circuits are incorporated into a single demod/FEC integrated circuit.” ARRIS-1005, 9:51-52. Joseph’s front-end circuitry receives and demodulates MPEG broadcast signals to produce an MPEG transport stream. ARRIS-1005, 6:43-45, 9:51-52, FIG. 4; ARRIS-1003, ¶91.

Additionally, Joseph discloses “a channel demultiplexer 62” that extracts desired programming. ARRIS-1005, 7:33-38, FIG. 4. Joseph’s demultiplexer 62
extracts a selected program from an MPEG transport stream. *Id.*; ARRIS-1003, ¶91.

To enable receiving and decoding MPEG signals, a POSITA would have found it obvious to use Joseph’s tuner, front-end circuitry, and demultiplexer in Browne to extract compressed MPEG data from the broadcast program signals. ARRIS-1003, ¶91. Joseph’s tuner, front-end circuitry, and demultiplexer for MPEG signals includes the same structure described in the ’093 patent for extracting from the broadcast program signals compressed data including a broadcast program selected and specified by a user. *Id.* Thus, Browne and Joseph render obvious feature [1b], even assuming Patent Owner argues for the District Court’s narrower construction. Feature [8b] is a method step corresponding to feature [1b] and would be rendered obvious by Browne and Joseph for similar reasons. ARRIS-1003, ¶¶90-92.

**b. Decompression – Features [1c]-[1e] and [8c]-[8e]**

As discussed above in Ground 1[1c], Browne describes the structure of the claimed decompression means (decompressor 106d) as set forth in the construction provided at Section IV. Although Petitioners believe that construction is proper under the BRI standard, Petitioners acknowledge that a District Court resolved to a narrower construction of the corresponding structure. *See* ARRIS-1008, 10, 11
(holding that “the structure associated with ‘decompressing means’ is an MPEG decoder, and equivalents thereof.”)

To the extent Patent Owner argues for a narrower mapping of the corresponding structure that requires the MPEG decoder cited in the District Court’s construction, Joseph describes such an MPEG decoder. ARRIS-1005, 1:49-56, 9:51-10:32, FIGS. 4 and 7; ARRIS-1003, ¶94. For the reasons discussed above at Section V.B, a POSITA would have found it obvious to include Joseph’s MPEG decoder in Browne’s system to implement the MPEG technology disclosed by Joseph. ARRIS-1003, ¶¶93-95.

Specifically, Joseph, which was written after widespread adoption of the MPEG format for broadcast television, explicitly recognizes that “[t]he compression and decompression of packetized video and audio signals may be accomplished according to the Motion Picture Expert Group (MPEG) standard for performing digital video/audio compression.” ARRIS-1005, 1:49-53. Accordingly, Joseph discloses a receiver unit having “an MPEG-1 or MPEG-2 video/audio decoder in order to decompress the received compressed video/audio.” Id., 1:54-56. Further, as shown in FIG. 7, the transport stream in Joseph includes MPEG data that would subsequently be decoded by Joseph’s audio/video decoder circuit 72. See id., 9:51-10:32, FIG. 4; ARRIS-1003, ¶94.
From this description and for the reasons discussed above at Section V.B, a POSITA would have been motivated to replace Browne’s decompressor with Joseph’s MPEG decoder to enable decoding of received MPEG broadcast signals. With this modification, Joseph’s MPEG decoder in Browne’s system decompresses compressed MPEG data extracted by the broadcast program extraction means (Joseph’s tuner, front-end circuitry, and demultiplexer) and outputs the decompressed data, as required for feature [1c]. ARRIS-1003, ¶94.

Further, features [1d] and [1e] each recite “decompressed data from said decompression means.” For the reasons discussed above, in the combination of Browne and Joseph, the decompressed data received and output by Browne’s digital interface would be the decompressed data from Joseph’s MPEG decoder. ARRIS-1003, ¶¶93-95. Features [8d]-[8e] are method steps that correspond to features [1c]-[1e] and are therefore also rendered obvious by Browne in view of Joseph. Id.

c. Controller – Features [1e] and [8e]

As discussed above in Ground 1[1e], Browne describes the structure of the claimed control means (controller) as set forth in the construction provided at Section IV. Although Petitioners believe that construction is proper under the BRI standard, Petitioners acknowledge that a District Court resolved to a narrower construction of the corresponding structure. See ARRIS-1008, 13, 14 (holding that
the associated structure is “a controller, including a processor and memory, implementing an algorithm as described in the specification at 12:49-13:11 and 16:22-17:23, and equivalents thereof.”).

To the extent Patent Owner argues that the “control means” should be narrowly construed as a computer-implemented means to further require a memory and an algorithm (e.g., the algorithm at 12:49-13:11 and 16:22-17:23 identified by the District Court), Browne and Joseph renders obvious these features. ARRIS-1003, ¶96-105. Indeed, the controller 105 of Browne “retains data...in RAM memory for future control of the multi-source recorder player 100.” ARRIS-1004, 22. Also, an “index of programs” is “held in the memory of the controller 105.” ARRIS-1004, 14. Similarly, Joseph teaches “a micro-controller 58” along with “a system RAM 70” as well as “an audio-video decoder circuit 72 having a random-access-memory (RAM) 74).” ARRIS-1005, 7:14-23, FIG. 4. Thus, Browne and Joseph render obvious a controller, including a processor and memory. ARRIS-1003, ¶97.

Moreover, because the controller 105 of Browne “is a microprocessor which preferably runs a user control program,” it necessarily implements an algorithm in carrying out its control functions. ARRIS-1004, 13; ARRIS-1003, ¶¶98-102. Under the BRI standard, Browne renders obvious the same or equivalent algorithm as the ’093 patent for controlling, based on an instruction from the user, the
selection of an output from the digital interface selected from the compressed data and the decompressed data. *Id.*

For instance, the ’093 patent describes “that a transport stream and an MPEG-decoded digital audio signal may be supplied to each of the DVTR 100 and the AVHDD unit 200, and the user may select the transport stream or the digital audio signal to be output.” ARRIS-1001, 17:7-19; see also ARRIS-1001, 15:9-14 (“Alternatively, either of the transport stream, or digital data, such as content information, to be supplied from the demultiplexer 132 via the controller 30, may be selected.”). From this description, under the BRI standard, an algorithm that the ’093 patent’s controller uses to select from the compressed data and the decompressed data is an algorithm in which the controller receives user input selecting from compressed or decompressed output. *Id.*; ARRIS-1003, ¶99. For the reasons described at Ground 1[1e], Browne describes this very same algorithm in which the controller receives user input selecting from compressed or decompressed output. ARRIS-1004, 13, 16, 22, 27, 33, FIG. 7; ARRIS-1003, ¶100. Thus, Browne and Joseph render obvious a controller and a memory that implement an algorithm in which the controller selects compressed or decompressed output based on received user input selecting from compressed or decompressed output. *Id.*
Additionally, under the BRI standard, the ’093 patent describes at 12:49-13:11 and 16:22-17:23 additional algorithms for controlling, based on an instruction from the user, the selection of an output from the digital interface selected from the compressed data and the decompressed data. ARRIS-1001, 12:49-13:11 and 16:22-17:23; ARRIS-1003, ¶¶101-103. Under the BRI standard, these algorithms in the ’093 patent display a list of digital external units for user selection, determine which type of digital external unit has been selected, and select compressed or decompressed output based on the type of digital external unit selected. Id.

As described at Ground 1[1e], Browne describes a similar algorithm in which Browne’s system displays a list of outputs for user selection, determines which type of output has been selected, and selects compressed or decompressed output based on the type of output selected. ARRIS-1004, 13, 16, 22, 27, 33, FIG. 7; ARRIS-1003, ¶102. Although Browne describes selection of the type of output, rather than type of digital external unit, a POSITA would have found selection of the type of digital external unit to be an obvious solution in view of Browne’s disclosure of an algorithm that selects the type of output. ARRIS-1003, ¶103. As Browne explains, “[o]utput 112g may be used for sending decompressed digital data…to a digital television receiver” or “[o]utput 112h may be used to output…compressed program data…to any receiver with decompression
circuitry.” ARRIS-1004, 16, 27 (“Output selection is not limited to 112a-112c, but may be any of the outputs 112a-112h of the multi-source recorder player 100.”). Thus, Browne contemplates selection of the type of output as corresponding to selection of the type of digital external unit. ARRIS-1003, ¶103.

From this description coupled with Browne’s disclosure of output selection, a POSITA would have found it obvious to select compressed or decompressed output based on selection of the type of digital external unit (“digital television receiver” or “receiver with decompression circuitry”). ARRIS-1004, 16, 27; ARRIS-1003, ¶104. Indeed, a POSITA would have seen controller selection of compressed or decompressed output as having a finite number of options including a first option of selecting the type of output or a second option of selecting the type of device receiving the output. Id. Thus, a POSITA would have found it obvious to modify Browne (or Browne and Joseph) to implement the controller’s selection of compressed or decompressed output based on user selection of the type of digital external unit. Id. And, at the very least under the BRI standard, a POSITA would have seen Browne’s selection of type of output to be an equivalent algorithm to the ’093 patent’s selection of the type of digital external unit. Id.

Thus, Browne (or Browne in view of Joseph) renders obvious “control means for controlling, based on an instruction from the user, the selection of an output from said digital interface means to said digital external unit, said output
being selected from the compressed data extracted by said broadcast program
extraction means and the decompressed data from said decompression means.”
ARRIS-1003, ¶¶96-105.

[3] “The digital broadcast receiving apparatus according to claim 1, wherein the
compressed data comprises data which is compressed by an MPEG method.”

As explained at Section V.B, the system of Browne, in view of Joseph,
renders obvious that data which is compressed by an MPEG method is the
compressed data received via input 101g of Browne.  See ARRIS-1005, 1:9-13,

Thus, Browne in view of Joseph renders obvious “wherein the compressed
data comprises data which is compressed by an MPEG method.” ARRIS-1003,
¶¶82-88.
C. [GROUND 3] Browne in view of Hoffman Renders Obvious Claim

1 and 8 under §103 and [GROUND 4] Browne in view of Joseph

and Hoffman Renders Obvious Claims 1, 3, and 8 under §103

As discussed in Grounds 1 and 2, [1d] and [8d], supra, Browne discloses a digital interface\(^4\) that outputs each of the compressed data and the decompressed data to a digital external unit based on user selection. ARRIS-1004, 16. In Grounds 3 and 4, Petitioners provide additional discussion addressing features [1d] and [8d] and explaining motivations for replacing Browne’s digital interface with Hoffman’s IEEE1394 interface. However, the above discussion of Browne in Ground 1 is relevant to Ground 3, as that discussion is incorporated in Ground 3

\(^4\) Browne’s digital interface is the digital interface in each of Grounds 1 and 2. Accordingly, the proposed substitution of Hoffman’s IEEE1394 interface for Browne’s digital interface applies equally to Browne alone (Ground 1) and Browne and Joseph (Ground 2). Accordingly, Grounds 3 and 4 are presented together, as a POSITA would have found it obvious to replace Browne’s interface to digital outputs 112g and 112h with Hoffman’s IEEE1394 interface in the same way when reviewing Browne alone (Ground 1) or when reviewing Browne in combination with Joseph (Ground 2).
and renders obvious the features of claims 1 and 8 for reasons similar to those presented in Ground 1. Also, the above discussion of Browne and Joseph in Ground 2 is relevant to Ground 4, as that discussion is incorporated in Ground 4 and renders obvious the features of claims 1, 3, and 8 for reasons similar to those presented in Ground 2.

With this background, even if Patent Owner argues that the claimed digital interface feature should be narrowly interpreted such that Browne is considered to not expressly disclose this feature (e.g., by requiring that the compressed and decompressed data be output from a single line), it would have been obvious to further combine the teachings of Browne (or Browne and Joseph) with those of Hoffman to render this feature obvious. ARRIS-1003, ¶¶106-116.

First, a POSITA would have recognized that Hoffman offers an elegant solution, via a high-speed IEEE 1394 interface, to the problem of crowded output ports in Browne. ARRIS-1003, ¶¶109-113. In particular, as shown in FIG. 1 (below), Browne describes a multi-source recorder player 100 that “preferably has a plurality of outputs, shown as 112a-112h in FIG. 1.” ARRIS-1004, 15. Browne discloses that its system “may have eight video and eight stereo audio outputs.” Id. Browne also includes modulators 111, “preferably one modulator for each modulated output signal.” Id.
A POSITA would have recognized that Browne’s system would require a larger number of connectors and corresponding cables to connect a different device to each of its many outputs. ARRIS-1003, ¶109.

Hoffman recognizes a problem with the increasing number of output ports, describing that the need to connect multiple devices “requir[es] a great deal of space for the connectors” and that “the growing number of cables overwhelms many users.” ARRIS-1006, 334. To this end, Hoffman discloses that “[t]he IEEE 1394 high-speed serial bus” improves the transmission of digital data “for professional and consumer electronics products.” Id., Abstract. Not only does the
use of the IEEE 1394 bus allow a “physically small” interface where a “thin serial cable can replace larger and more expensive interfaces,” it provides for more bandwidth, allowing “up to 63 devices attached to it.” *Id.*, 335-336. As illustrated in the Hoffman diagram below, a digital monitor, a computer, a digital VCR, and a printer can all be connected to the data source via a single IEEE 1394 cable.

![Hoffman Diagram](image)

ARRIS-1006, 336 (annotated).

In fact, a multitude of references after Browne (but before the ‘093 patent) similarly tout the benefits of incorporating IEEE 1394 technology into conventional devices. ARRIS-1003, ¶¶31-31, 106. Just to name a few other examples, Hurley describes a “move to digital interconnection of home equipment
using IEEE1394.” ARRIS-1014, Abstract. Severance describes that the IEEE 1394 technology “proposes to provide a single port on the back of our computers that can handle nearly all of the communication for which we now need eight to 10 ports.” ARRIS-1015, 119.

A POSITA would have recognized that incorporating the IEEE 1394 interface, for example as disclosed by Hoffman, to the plurality of outputs 112a-112h (or at least digital outputs 112g and 112h) of Browne would result in the desirable outcome of reducing the excess space taken up by the multitude of wires and connectors at the output section of Browne. ARRIS-1003, ¶¶108-113. While Browne describes the use of two separate digital output 112g and 112h to output decompressed digital data to a digital television (e.g., digital monitor) and compressed digital data to a receiver with decompression circuitry (e.g., computer), Hoffman achieves the same result—namely outputting to a digital monitor and a computer—by using a single IEEE 1394 cable. Id.

Second, a POSITA would have recognized that the trend of moving from analog to digital, especially in the broadcast arena, eliminates the need for D/A converters that are provided in Browne. ARRIS-1003, ¶114. To this point, Hoffman recognizes that “[b]roadcast and cable television are migrating to digital transport” and that “[a] new interface is needed by the analog world migrating to a fully digital environment.” ARRIS-1006, 334. By replacing the downstream
section of Browne, as illustrated below in FIG. 1, with a fully digital IEEE 1394 interface, the complexity of Browne’s system may be reduced while also decreasing the amount of space taken up by Browne’s output section. ARRIS-1003, ¶¶114-115.

ARRIS-1004, FIG. 1 (annotated).

Through the advantages of the IEEE 1394 interface described by Hoffman, a POSITA would have been motivated to replace Browne’s outputs 112a-112h and D/A converters 110 with Hoffman’s IEEE 1394 interface. ARRIS-1003, ¶¶114-115. With this replacement, as shown in the modified version of Browne’s FIG. 1 (below), Hoffman’s IEEE 1394 interface would receive the compressed and decompressed broadcast data provided to Browne’s digital outputs 112g and 112h.
and instead output that data through a single IEEE 1394 output. ARRIS-1003, ¶115. In this regard, the digital interface in the combination of Browne and Hoffman (i.e., Hoffman’s IEEE 1394 interface) receives compressed and decompressed broadcast data and outputs, from a single IEEE 1394 output, digital data selected from the compressed broadcast data and the decompressed broadcast data. *Id.*

ARRIS-1004, FIG. 1 (annotated).

Accordingly, Browne (or Browne and Joseph) in view of Hoffman renders obvious claims 1 and 8 (or claims 1, 3, and 8) by disclosing a digital interface that outputs, through a single high-speed wire, each of the compressed data and the decompressed data to a digital external unit based on user selection. ARRIS-1003, ¶¶106-119.
VI. CONCLUSION

All challenged claims are invalid as set forth in Grounds 1-4.

Respectfully submitted,

Dated: June 14, 2017

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VII. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(A)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)


VIII. RELATED MATTERS UNDER 37 C.F.R. § 42.8(B)(2)

The ’093 Patent is the subject of Certain Digital Cable and Satellite Prods., Set-Top Boxes, Gateways, and Components Thereof, Investigation No. 337-TA-1049, pending before the International Trade Commission. The ’093 Patent was recently voluntarily dismissed by Sony from Case No. 1:15-cv-00288-SLR-SRF in the District of Delaware.

IX. LEAD AND BACK-UP COUNSEL UNDER 37 C.F.R. § 42.8(B)(3)

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X. SERVICE INFORMATION

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for Inter Partes Review totals 11,582, which is less than the 14,000 allowed under 37 CFR § 42.24(a)(i).

Respectfully submitted,

Dated: June 14, 2017

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) et seq. and 42.105(b), the undersigned certifies that on June 14, 2017, a complete and entire copy of this Petition for Inter Partes Review, power of attorney, and all supporting exhibits were provided via Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

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