UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOGO BUSINESS AVIATION LLC,

Petitioner,

v.

SMARTSKY NETWORKS LLC,

Patent Owner

Case IPR2020-00709

Patent 9,312,947

PATENT OWNER'S PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107

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LIST OF EXHIBITS CITED

Exhibit	Description
Ex. 2001	Declaration of Gerard James Hayes, Ph.D.
Ex. 2002	IEEE Standard Definitions and Concepts for Dynamic Spectrum Access: Terminology Relating to Emerging Wireless Networks, System Functionality, and Spectrum Management ("IEEE Standard Definitions")
Ex. 2003	U.S. Patent Application Publication No. 2002/0160773 ("Gresham")
Ex. 2004	U.S. Patent Application Publication No. 2005/0256616 ("Rhoads")
Ex. 2005	U.S. Patent Application Publication No. 2006/0219776 ("Finn")
Ex. 2006	U.S. Patent Application Publication No. 2005/0108374 ("Pierzga")

I. Introduction

Smartsky Networks LLC ("Patent Owner") submits the following Preliminary Response to the Petition for *Inter Partes* review ("the Petition") filed by Gogo Business Aviation LLC ("Petitioner") regarding claims 1-20 of U.S. Patent No. 9,312,947 (the '947 patent). Petitioner has alleged that claims 1-20 of the '947 patent are unpatentable under 35 U.S.C. §102 and under 35 U.S.C. §103 over several prior art references using several alternative proposed grounds. Petition at 5. These proposed grounds are divided into two groups including a first set of three separate grounds that are based on the 2004 edition of the Institute of Electrical and Electronics Engineers' (IEEE) Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed Broadband Wireless Access Systems ("IEEE-2004") as the primary reference, and a second set of four separate grounds that are based on JP 2005/159448 (and English translation) ("Miura") as the primary reference.

However, in all of these grounds, an element of the claims of the '947 patent is missing from all of the cited references. Petitioner's only attempt to address the missing element is to offer a proposed meaning for the missing element that essentially reads the missing element out of the claim entirely. The failure of all of the cited references to teach or suggest at least one feature of all of the claims of the '947 patent clearly establishes that institution of *inter partes* review should be denied. In this regard, by proposing a meaning for a claim term that reads the missing

element out of the claim, and then only building its case to establish unpatentability for a hypothetical claim that lacks the missing element, the Petition fails to establish a *prima facie* case of obviousness relative to the actual claims of the '947 patent, and the proposed grounds based on anticipation are also clearly baseless on their face. Accordingly, the Board should deny institution of *inter partes* review since Petitioner has not shown a reasonable likelihood of prevailing with respect to at least one of the challenged claims in the Petition.

However, it is also significant to note that Petitioner has merely presented a series of proposed grounds of rejection that are weakly supported, and for which there is very little effort expended to highlight for the Board how the proposed grounds differ, much less are an improvement over, the grounds the Examiner already considered. In fact, to the contrary, the only effort expended by Petitioner in this regard was to issue incorrect and misleading statements about the prior art.

Specifically, several of the asserted grounds are based on references the Examiner already considered during examination. Petitioner not only failed to highlight the references already considered, and otherwise frame the reasons why the proposed grounds including such references are distinct from references already considered during prosecution of the '947 patent, but Petitioner also made incorrect and misleading statements to the Board characterizing the references used in the Petition. In addition to those already considered references, Petitioner introduces

references that, while not themselves considered during prosecution, present the same base teachings known in the art as in the references that were considered during prosecution. These additional references are nothing more than a substitution of references that disclose the same subject matter that the Examiner already considered, and that the Patent Owner successfully overcame. Given that the purpose of *inter partes* review proceedings is to allow parties to present issues *not* considered during the original prosecution, this Board's consideration of similar art and arguments would be duplicative and thus a misuse of the Board's resources and time. For at least these reasons, the Board should also exercise its discretion pursuant to 35 U.S.C. §325(d) and deny institution of *inter partes* review.

Accordingly, and as shown further below, the Petition satisfies the different factors the Board uses to aid its analysis in determining whether to exercise its discretion under 35 U.S.C. § 325(d) to deny institution, and also fails to demonstrate a reasonable likelihood of prevailing with respect to at least one of the challenged claims in the Petition because at least one element of the claims of the '947 patent is clearly missing from all of the cited references. For either or both of these reasons, the Board should deny institution of *inter partes* review.

II. The '947 patent

A. '947 patent Prosecution History and Overview of Cited Art

1. '947 patent Prosecution History

The '947 patent provides, among other things, a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams. Ex. 1001, col. 10, lines 6-7. The '947 patent issued from U.S. Patent Application No. 13/862,508, which was filed on April 15, 2013.

During examination of the '947 patent, both U.S. Patent Application Publication No. 2005/0164664 to DiFonzo ("DiFonzo") and U.S. Patent Application Publication No. 2008/0233974 to Xu ("Xu") were considered by the Examiner. Ex. 1012 at 397, 407. Moreover, although not acknowledged by Petitioner, both DiFonzo and Xu were cited in rejections by the Office on the exact same claims for which DiFonzo and Xu are relied upon in connection with the grounds articulated in the Petition. *See* Ex. 1012 at 397, 407. In this regard, the first Office Action issued for the '947 patent on November 13, 2014 included the following rejections:

- Claims 1, 5-9, 11 and 15-19 rejected under 35 USC §103(a) as being unpatentable over Gresham et al. (U.S. Patent Application Publication No. 2002/0160773, hereinafter "Gresham") in view of

DiFonzo and further in view of Rhoads (U.S. Patent Application Publication No. 2005/0256616);

- Claims 2, 3, 12 and 13 rejected under 35 USC §103(a) as being unpatentable over Gresham, DiFonzo and Rhoads and further in view of Finn (U.S. Patent Application Publication No. 2006/0219776);
- Claims 4 and 14 rejected under 35 USC §103(a) as being unpatentable over Gresham, DiFonzo and Rhoads and further in view of Xu; and
- Claims 10 and 20 rejected under 35 USC §103(a) as being unpatentable over Gresham, DiFonzo and Rhoads and further in view of Pierzga et al. (U.S. Patent Application Publication No. 2005/0108374, hereinafter "Pierzga". Ex. 1012 at 397-410.

On February 13, 2015, Patent Owner filed a response to the Office Action traversing all of the above listed rejections. The Examiner then repeated the identical rejections in a final Office Action dated March 10, 2015. Patent Owner proceeded to appeal the final rejections and submitted an Appeal Brief on September 8, 2015. In response to the Appeal Brief, claims 1-20 of the '947 patent were allowed. Ex. 1012 at 500.

2. Overview of Art Specifically Relied on in Rejections of Claims During Prosecution of '947 patent

a) GRESHAM (Ex. 2003)

Gresham, which was relied upon in the rejection of independent claims 1 and 11 (as well as various dependent claims) in the final Office Action of March 10, 2015, is generally directed to a communications system for a passenger aircraft to provide Internet services to passengers. Ex. 2003, ¶0002. In this regard, Gresham describes a system in which a number of base stations may be located spaced apart over the surface of the planet. Ex. 2003, ¶0175. Paragraph 0178 of Gresham refers to a first base station 90 and a second base station 120 that correspond to cells 400 and 410, which define the coverage areas for the base stations 90 and 120. The cells 400 and 410 have a region of overlap 420 between them. Ex. 2003, ¶0178. These base stations are described as land based stations, which paragraph 0178 further indicates may be provided in various geographic locations to cover main airline routes.

Paragraph 0179 of Gresham further indicates that an aircraft (presumably having a receiver station for providing data from the base stations to an onboard server 20) flying from London to New York will connect to the first base station 90 initially (i.e., while in the coverage area of the first cell 400). Each time the aircraft connects to station 90, the aircraft exchanges data carrying messages and cache

updates. However, as provided in paragraph 0180, when the aircraft enters the transition area 420, station 90 commands the server 20 to contact station 120 for subsequent connections. Cache updates are thereafter conducted using the second station 120.

The communications that Gresham establishes (i.e., these cache updates) are intermittent, interrupted and non-direct. In this regard, Gresham routinely describes throughout its disclosure that intermittent links are used to periodically upload and download data from a cache of the onboard server 20 to update the server to form a virtual world wide web. Paragraphs 0012 and 0019 describe the creation of this "virtual" world wide web using the cache, and explicitly indicate that original websites themselves are not accessed in flight by the server 20. Paragraph 0013 explains that a proxy server emulates the response of ground-based electronic messaging systems. Paragraph 0040 describes how server 20 "masquerades" as the passenger's usual domain name server to produce a "locally generated" worldwide web page. Message retrieval is said to be accomplished in a manner that is indistinguishable from message retrieval on the ground. Ex. 2003, ¶0049.

Gresham further indicates that the server 20 connects to the station at 15 minute intervals (Ex. 2003, ¶0120), and that the server 20 terminates communication sessions with the station 90 and any messages received are stored in the cache until the next connection. Ex. 2003, ¶0122. Gresham further indicates that "there is no

possibility for a passenger browsing the pages within the cache on board the aircraft to visit Internet sites which have not been stored in the cache." Ex. 2003, ¶0111. Thus, Gresham is quite explicit in describing a system where communications between air and ground are conducted in an intermittent fashion to update an onboard server that attempts to replicate the world wide web with stored information.

b) DIFONZO (Ex. 1005)

DiFonzo, which was relied upon in the rejection of independent claims 1 and 11 (as well as various dependent claims) in the final Office Action of March 10, 2015, is generally directed to a mesh network communications system having a hub node and remote nodes, where a network controller controls communications links and, in some instances steerable beams, between the hub node and the remote nodes. Ex. 1005, ¶0018. To support the operation of the mesh network, DiFonzo describes the use of steerable beams and the hardware to support operation of the steerable beams. In this regard, the steerable beams of DiFonzo are generated via "[s]teerable-beam antennas [that] take the form of phased arrays or other lens or reflector optics configurations with either single or multiple beams from the same aperture where each beam is independently steerable." Ex. 1005, ¶0035. In the rejection of claim 1 of the final Office Action of March 10, 2015, DiFonzo was relied upon for allegedly addressing the claim element of "a radio configured via software defined radio to utilize beam forming to generate a plurality of steerable beams, to enable multiple

reuses of a same frequency to communicate with respective different in-flight communication nodes via respective different communication links." Ex. 1012 at 399. As indicated above, the Examiner later found all claims to be patentable over DiFonzo.

c) RHOADS (Ex. 2004)

Rhodes, which was relied upon in the rejection of independent claims 1 and 11 (as well as various dependent claims) in the final Office Action of March 10, 2015, is generally directed to upload/download of content to a vehicle information system using high speed data communications. Ex. 2004, ¶0016.

d) FINN (Ex. 2005)

Finn, which was relied upon to address aspects of dependent claims in the final Office Action of March 10, 2015, is generally directed to a communication device in the form of an RFID reader that may be configured to operate using Orthogonal Frequency Division Multiplexing (OFDM). Ex. 2005, ¶0162.

e) XU (Ex. 1004)

Xu, which was also relied upon in the final Office Action of March 10, 2015, is generally directed to Multimedia Broadcast and Multicast Services (MBMS) in a Radio Access Network (RAN) in Long Term Evolution (LTE). Ex. 1004, ¶0002. In the final Office Action of March 10, 2015, Xu was relied upon for allegedly addressing dependent claim elements relating to LTE. Ex. 1012 at 408.

f) PIERZGA (Ex. 2006)

Pierzga, which was also relied upon in the final Office Action of March 10, 2015 to address aspects of dependent claims, is generally directed to an airbourne radio-relay system comprising airborne stations and non-airborne stations that form sub-networks to support connectivity of mobile stations between sub-networks. Ex. 2006, ¶0048.

3. Effective filing date of the '947 patent

Petitioner suggests that claims 1-20 of the '947 patent are not entitled to a priority date earlier than January 12, 2007. (Petition at 2-4). Patent Owner expressly does not concede this point, and reserves the right to demonstrate evidence of the priority date to which various claims are entitled to the extent that *inter partes* review is instituted. However, the decision on whether to institute *inter partes* review can be made at this stage assuming arguendo the proposed priority dates Petitioner set forth in the Petition. In this regard, even if the alleged priority dates Petitioner proposes were accepted (again only for the sake of argument), the Petition clearly fails to demonstrate a likelihood of prevailing with respect to at least one of the challenged claims in the Petition.

III. Level of Ordinary Skill in the Art

For purposes of this Preliminary Response only, Patent Owner adopts Petitioner's definition of a person of ordinary skill in the art ("POSA"). Petition at 21-22.

IV. Claim Construction

Petitioner proposes that no claim terms of the '947 patent require construction, but argues that the phrase "software defined radio to utilize beamforming to generate a plurality of steerable beams" should be given its plain and ordinary meaning. Petition at 24. The plain and ordinary meaning proffered by Petitioner is "to form and/or steer radio waves in a particular direction using software." Petition at 24.

Patent Owner agrees with Petitioner that no claim terms of the '947 patent require construction at this stage, and that the claim terms should be given their plain and ordinary meaning. However, Patent Owner disagrees with Petitioner with respect to exactly what that plain and ordinary meaning should be, at least with respect to the phrase "software defined radio to utilize beamforming to generate a plurality of steerable beams."

In this regard, as an initial matter, Petitioner has extracted the above-quoted phrase from its full and proper context, and then offered a proposed meaning for the phrase that effectively (and inappropriately) reads the term "software defined radio"

out of existence. Specifically, the above-quoted phrase is actually a subcomponent of a larger phrase, which is "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams." Thus, according to the plain meaning of this term, the fundamental question becomes, is configuration of a radio to conduct beamforming using software the same thing as configuration of a radio to conduct beamforming via software defined radio? Contrary to the contentions of Petitioner, and Petitioner's Expert, an evidentiary-based evaluation of the topic clearly establishes that it is not.

Petitioner's proposal to simply replace the term "software defined radio" with the term "software" not only oversimplifies the claim in a logically impermissible way, but also fundamentally changes the meaning of the claim in a way that is contrary to how a POSA would understand the plain and ordinary meaning of the term. In this regard, the term "software defined radio" has a well understood meaning that a POSA would not construe to be equivalent to "software." Moreover, Petitioner's only basis for making this oversimplification, and incorrect assertion, is a purely conclusory statement made by Petitioner's Expert without any reliance whatsoever on evidence of any kind.

In Ex. 1002, at ¶39, Petitioner's Expert states that the oversimplified alleged plain meaning proposed is consistent with the '947 patent and file history, and the understanding of a POSA, and lists references to software defined radio in the

specification of the '947 patent and in the Appeal Brief of September 8, 2015, which do not in any way support the oversimplified alleged plain meaning proposed. Instead, the passages that reference software defined radio relate software defined radio to employment in connection with beamforming, but do not in any way equate beamforming via software defined radio to beamforming via software generally. Thus, none of the information provided at ¶39 of Ex. 1002 serves as evidence in support of oversimplified alleged plain meaning proposed.

Moreover, simple logic dictates that if Patent Owner had intended to merely claim a radio configured "to form and/or steer radio waves in a particular direction using software" instead of with software defined radio, Patent Owner would have left the additional two words (i.e., "defined" and "radio") out of the claim. Patent Owner instead included the full phrase "software defined radio" with the clear intention that such phrase be given its broadest reasonable interpretation. However, it is entirely unreasonable to suppose that the broadest reasonable interpretation of the phrase would be to condense the three-word phrase down to a single word from the phrase, much less when it is so clear that doing so changes the meaning fundamentally. Based on this simple logic alone, the oversimplified alleged plain meaning proposed by Petitioner is clearly exposed as being inapposite.

Meanwhile, as shown in the Declaration of Gerard James Hayes, Ph.D., any consideration of actual evidence on the subject definitively establishes the fact that

a POSA would clearly and unmistakably identify that forming and/or steering radio waves using software is not remotely the same as forming and/or steering radio waves using software defined radio. *See*, Ex. 2001, ¶¶46-56; Ex. 2002 at 18. Moreover, as further indicated by Dr. Hayes, a POSA would understand the phrase "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" to have a plain and ordinary meaning of "a radio configured using physical layer elements (including mixers, filters, amplifiers, modulators/demodulators, detectors, etc.), which are typically implemented in hardware, using software that is implemented on a programmed computer or embedded system in order to form and/or steer radio waves in a particular direction." Ex. 2001, ¶56. Notably, Dr. Hayes has based his opinion on source documentation that provides definitions that would have been familiar to a POSA. While such source documentation is not contemporaneous with the earliest possible priority date of the claims of the '947 patent, Dr. Hayes has further noted that the definition provided in such source documentation would have been the same during the range of applicable potential priority dates alleged in the Petition. Ex. 2001, ¶49.

This plain and ordinary meaning for the claimed phrase would be understood by a POSA based on the corresponding definition of "software defined radio" as also understood by a POSA. In this regard, "software defined radio" is radio that includes software reconfigurable hardware. In other words, "software defined radio" is radio

in which "physical layer elements (including mixers, filters, amplifiers, modulators/demodulators, detectors, etc.), which are typically implemented in hardware, are instead implemented in software on a programmed computer or embedded system." Ex. 2001, ¶56. Thus, radio that is "configured via software defined radio" as recited in independent claims 1 and 11 of the '947 patent is radio that has specific structure in that the physical layer includes software components that replace conventional hardware components. In this regard, software defined radio is characterized by structure, and not function. More particularly, software defined radio is characterized by the radio componentry that is implemented using software instead of hardware within the physical layer. The radio, when configured via software defined radio, can be rapidly reconfigured since no hardware components need to be changed for the reconfiguration. Thus, a radio configured via software defined radio is distinguished not on the basis of its function, but on the basis of the structure that performs its functions. Ex. 2001, ¶53. The plain and ordinary meaning proffered by Petitioner ignores this fact in an effort to eliminate the term "software defined radio" from consideration in relation to determining patentability of the claims of the '947 patent. However, the only plain and ordinary meaning having evidentiary support is that which has been provided by Patent Owner's Expert, Dr. Hayes. This plain and ordinary meaning demonstrates that for radio configuration via software defined radio, it is not equivalent, even under a

broadest reasonable interpretation standard, to merely equate using software for beamforming to using radio configured via software defined radio for beamforming as the Petition suggests.

It is also noteworthy that Petitioner has not alleged that the term "software defined radio" is merely functional language. Although Petitioner did not allege as much, and Patent Owner agrees that it is not, the evidence-based definition of the term outlined above and by Patent Owner's expert also firmly establish that term "software defined radio" is not merely directed to functional language. *See* Ex. 2001, ¶¶48-49. Independent claims 1 and 11 of the '947 patent are not claims that merely define a device by what it does, but instead define a device on the basis of the structure (specifically in the physical layer of the radio) that is used to do what it does. Thus, no casual dismissal of the term "software defined radio" as merely non-limiting functional language would be appropriate in this case, and Petitioner's failure to raise the issue is both an acknowledgement and admission of the same.

All claims of the '947 patent should be given their broadest reasonable construction in their ordinary usage as would be understood by a POSA in the context of the entire disclosure. *See* 37 CFR § 42.100, *In re Morris,* 127 F.3d 1048, 1054 (Fed. Cir. 1997). Furthermore, only those terms which are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 6-

7 (PTAB December 15, 2017) (Informative). For the purpose of this Preliminary Response only, no terms need to be construed to determine that institution should be denied. In this regard, particularly when the term noted above is given its proper plain and ordinary meaning, the failure of the Petition, on its face, to establish anticipation or *prima facie* obviousness of the claims of the '947 patent clearly demonstrates that institution should be denied, and therefore no other issues of claim construction need even be raised at this time. In the event institution is not denied, Patent Owner reserves the right to submit its proposal for claim construction at that time.

V. The Petition fails to establish a reasonable likelihood of prevailing with respect to any challenged claims.

The Petition has set forth a number of proposed Grounds of unpatentability. However, each of the Grounds suffers from a common flaw in that the Grounds fail to include prior art references that teach or suggest each and every element of the claims of the '947 patent. In this regard, none of the references cited teach or suggest at least "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams …" as required by all of the claims of the '947 patent. Without the missing element in connection with each of the Grounds, Petitioner has not, and cannot show, a reasonable likelihood of prevailing with respect to at least one of the challenged claims in the Petition. Accordingly, the

threshold for institution of *inter partes* review established in 35 U.S.C. §314 has not been met and the Board should deny institution.

A. Ground 1

Petitioner alleges that claims 1-3, 5, 7-13, 15 and 17-20 are anticipated by IEEE-2004 in Ground 1. Petition at 24. In this regard, Petitioner alleges that IEEE-2004 teaches each and every limitation of independent claims 1 and 11, and therefore anticipates claims 1 and 11 citing Petitioner's Expert as evidence for the claim. Petition at 25. Petitioner's Expert, as noted above, makes the bald assertion that the phrase "software defined radio to utilize beamforming to generate a plurality of steerable beams" should be given its plain and ordinary meaning, which is alleged to be "to form and/or steer radio waves in a particular direction using software." Ex. 1002, ¶39. As further noted above, this bald assertion is unsupported and incorrect, and inappropriately removes the term "software defined radio" entirely from the claims. The term "software defined radio" cannot be merely eliminated from the claims with this type of unsupported assertion. Indeed, as noted by Patent Owner's Expert, not only is the alleged plain and ordinary meaning proffered for this term by Petitioner (and Petitioner's Expert) incorrect, but IEEE-2004 clearly lacks any express or inherent disclosure of "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams," and other features, as required in independent claims 1 and 11 of the '947 patent. Ex. 2001, ¶57.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). IEEE-2004 fails to include any express disclosure of software defined radio, much less any express description of configuring a radio via software defined radio to utilize beamforming to generate a plurality of steerable beams, as required by independent claims 1 and 11. Moreover, IEEE-2004 also fails to inherently disclose such feature. "To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. USA v. Monsanto Co.,* 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749-50 (Fed. Cir. 1991). In the present situation, neither the Petition nor Petitioner's Expert has provided any evidence to make it clear that either software defined radio, or more importantly, configuring a radio via software defined radio to utilize beamforming to generate a plurality of steerable beams is inherently disclosed in IEEE-2004 due to its necessarily having been presented in IEEE-2004. Furthermore, other than simply reciting that counsel for Petitioner informed Petitioner's Expert that anticipation requires that the reference expressly or

inherently disclose each every element of the claim (*see,* Ex. 1002, ¶14), Petitioner's Expert did not provide any indication as to how IEEE-2004 either inherently or expressly taught or suggested configuring a radio via software defined radio to utilize beamforming to generate a plurality of steerable beams beyond alleging that IEEE-2004 teaches beamforming using software. Instead, Petitioner's Expert merely recites the fact that he understands that the reference must expressly or inherently disclose each feature (*see,* Ex. 1002, ¶14), and then alleges the plain and ordinary meaning of the feature is shown at a few general locations of a massive reference of over 850 pages in length. *See*, Ex. 1002, ¶66. However, beamforming using software is not inherently (or even remotely) the same as configuring a radio via software defined radio to utilize beamforming to generate a plurality of steerable beams as provided in independent claims 1 and 11 of the '947 patent. *See*, Ex. 2001, ¶52. Indeed, to the contrary, Patent Owner's Expert has demonstrated that IEEE-2004 in fact does not include any inherent disclosure of software defined radio, much less any express or inherent description of configuring a radio via software defined radio to utilize beamforming to generate a plurality of steerable beams. *See*, Ex. 2001, ¶66.

Referring now specifically to Ground 1, as articulated by Petitioner's Expert, Petitioner's Expert alleges that IEEE-2004 teaches "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" by virtue of disclosure at p. 162-165, 509-510 and 786 of Ex. 1003. Ex. 1002, ¶66. In

particular, Petitioner's Expert alleges that this disclosure of Ex. 1003 (i.e., p. 162-165, 509-510 and 786) would be understood by a POSA "to mean that software is used to steer a beam (i.e., beamforming)." Ex. 1002, ¶68.

Even if the allegation by Petitioner's Expert regarding what a POSA would understand the disclosures of IEEE-2004 to mean is conceded in full (i.e., that IEEE-2004 teaches using software for beamforming), the concession would still leave the element of claims 1 and 11 relating to "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" entirely absent from IEEE-2004 when the appropriate plain and ordinary meaning is assigned to the corresponding element as described above. In this regard, using software for beamforming is not the same as "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams." Thus, Petitioner's Expert has not demonstrated that the element "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" of claims 1 and 11 of the '947 patent is expressly or inherently disclosed by IEEE-2004.

In addition to Petitioner's Expert failing to demonstrate how IEEE-2004 explicitly or inherently discloses "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" instead of the irrelevant feature of using software to steer beams, which is alleged to be disclosed

by IEEE-2004, it should further be noted that IEEE-2004 does indeed fail to expressly or inherently disclose the claimed feature. In this regard, Petitioner's Expert cites Ex. 1003, p. 162-165, 509-510 and 786 for disclosing this feature. Ex. 1002, ¶66. Even a cursory review of these passages reveals that there is no explicit disclosure of the claimed feature in any of these passages (or in any part of IEEE-2004). The passage at p. 162-165 of IEEE-2004 discloses an adaptive antenna system (AAS), which Petitioner's Expert alleges provides disclosure relevant to frequency reuse, and "software-based beamforming processes." Ex. 1002, ¶68. However, AAS is not inherently performed via software defined radio. Ex. 2001, ¶64. Moreover, using software to conduct beamforming also does not inherently mean that a radio configured via software defined radio is associated with such beamforming. Ex. 2001, ¶ 63.

It is not clear why the other cited passages (i.e., 509-510, and 786 of IEEE-2004) have been cited, as Petitioner's Expert does not specifically reference any teachings in either passage that appears to have any relevance. Instead, a page is given without any comment on the specific contents on the pages, and the significance of such contents relative to the issues at hand. Moreover, both Petitioner's Expert and the Petition effectively only use IEEE-2004, which is larger than 850 pages, as a source for nothing more than vague references that Petitioner's Expert alleges have correlation to that which is claimed. As such, IEEE-2204 is used

as a massive source of verbiage having a vague relationship with that which is claimed. Rather than clearly articulate for the Board exactly which passages in the massive document are alleged to teach a corresponding feature of the claims of the '947 patent, both Petitioner and Petitioner's Expert merely point to a page and expect the Board to figure out the correspondence. In any case, the pages listed do not have any express or inherent disclosure of this claimed feature either. Thus, the cited passages fail to provide any express or inherent disclosure of "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as required by independent claims 1 and 11.

IEEE-2004 also lacks any relationship at all to communication with airborne assets. In this regard, references in IEEE-2004 to airborne assets are not provided in relation to communication with such assets. Instead, and entirely to the contrary, the references to such assets relate only to the interference either they cause, or that can be caused for them, by the terrestrial communications described in IEEE-2004. Ex. 2001, ¶62. Thus, IEEE-2004 fails to teach or suggest a radio that enables "multiple reuses of a same frequency to communicate with respective different *in-flight communication nodes* via respective different communication links" (emphasis added) as also required by independent claims 1 and 11. IEEE-2004 also necessarily fails to teach or suggest that such links "maintained continuous and uninterrupted in time while one of the respective different *in-flight communication nodes* transitions

between a first steerable beam associated with a first coverage area defined by the network base station and a second steerable beam associated with a second coverage area defined by another network base station" (emphasis added) as required by independent claims 1 and 11. Petitioner's Expert has therefore also failed to establish unpatentability of claims 1 and 11 over IEEE-2004 for at least this reason.

Given that Ground 1, as articulated in the Petition, is built entirely on the case for Ground 1 articulated in the Expert Declaration of Ex. 1002, the Petition fails to establish that all elements of claims 1 and 11 of the '947 patent are expressly or inherently disclosed in IEEE-2004 for the same logical reasons Petitioner's Expert failed to establish as much. In this regard, IEEE-2004 provides no explicit mention of software defined radio, and also fails to provide any inherent disclosure of software defined radio, much less configuration of a radio via software defined radio to utilize beamforming as required in independent claims 1 and 11 of the '947 patent.

Patent Owner believes that IEEE-2004 also fails to teach or suggest other features of numerous claims of the '947 patent. Moreover, Patent Owner believes that a fully developed record of evidence detailing these failures will be established if *inter partes* review is instituted in this case. However, *inter partes* review should not be instituted on Ground 1 based on the clear failure of IEEE-2004 to expressly or inherently disclose at least the feature of "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams," and failing

to have any relationship to communication with in-flight communication nodes as required in independent claims 1 and 11 of the '947 patent. The clear failure in this regard demonstrates that Petitioner has not met its threshold burden of demonstrating a reasonable likelihood of success with respect to at least Ground 1. In particular, the failure of Petitioner and Petitioner's Expert to establish how at least one feature of independent claims 1 and 11 is either expressly or inherently disclosed in IEEE-2004 leaves the Petition incapable of demonstrating a likelihood of prevailing in demonstrating unpatentability of any claims on grounds that rely on IEEE-2004 for disclosure of the corresponding feature.

Since IEEE-2004 fails to teach or suggest at least one feature of independent claims 1 and 11, Petitioner cannot demonstrate a reasonable likelihood of success in prevailing relative to the challenges articulated in Ground 1. Accordingly, *inter partes* review should not be instituted relative to Ground 1.

B. Grounds 2 and 3

As noted above, IEEE-2004 fails to teach or suggest at least one feature of independent claims 1 and 11. Grounds 2 and 3 each also rely on IEEE-2004 with respect to the same missing feature, but combine additional references (namely Xu and DiFonzo) to disclose additional dependent claim features. Petition at 38, 40.

Neither Petitioner nor Petitioner's Expert alleges that Xu or DiFonzo provide any teaching or suggestion of "a radio configured via software defined radio to

utilize beamforming to generate a plurality of steerable beams" as required in independent claims 1 and 11 of the '947 patent. Moreover, as noted by Patent Owner's Expert, neither Xu nor DiFonzo provides any express or inherent disclosure regarding software defined radio, much less "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as required in independent claims 1 and 11 of the '947 patent. Ex. 2001, ¶¶83, 87. Accordingly, Xu and DiFonzo cannot cure the above-noted deficiencies of IEEE-2004 in relation to this feature. Additionally, the Petition fails to make the case that it would have been obvious to a POSA at the time of filing of original disclosure corresponding to the '947 patent, based on an assumption that IEEE-2004 discloses using software for beamforming, to employ a radio configured via software defined radio to perform such beamforming. Finally, as noted by Patent Owner's Expert, no such conclusion of obviousness could be made in any case. Ex. 2001, ¶¶83, 87. The Petition therefore also fails to demonstrate a reasonable likelihood of success in prevailing relative to the challenges articulated in Grounds 2 and 3. Accordingly, *inter partes* review should not be instituted be instituted relative to Grounds 2 and 3.

C. Ground 4

Petitioner alleges that claims 1-3, 7-13 and 17-20 are obvious in view of Miura and Agee in Ground 4. Petition at 41. In this regard, Petitioner alleges that both Miura and Agee teach or suggest the phrase "a radio configured via software defined

radio to utilize beamforming to generate a plurality of steerable beams" based on the oversimplified alleged plain meaning proposed by Petitioner for this term (i.e., "to form and/or steer radio waves in a particular direction using software." (Ex. 1002, ¶39)). Petition at 44-45.

In relation to each of Miura and Agee, Petitioner attempts only to establish that such references provide teachings that a POSA would understand as the use of software to steer a beam. Petitioner incorrectly assumes that the use of software to steer a beam is alleged to be equivalent to teaching or suggesting the phrase "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams." *See*, Ex. 2001, ¶52. Given that, as noted above, steering beams via software is not equivalent to a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams, even if it is entirely conceded that Miura and Agee disclose using software to steer a beam (or using software for beamforming), the concession still leaves the element of claims 1 and 11 relating to "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" entirely absent from each of Miura and Agee.

As noted above, even if successful in proving that Miura and/or Agee disclose using software to steer a beam, when stripped of the oversimplified alleged plain meaning Petitioner proposes for the claim element relating to "software defined

radio," the Petition fails on its face to demonstrate the Miura and Agee combine to render independent claims 1 and 11 obvious. Given that the Petition leads out with an oversimplified alleged plain meaning that ignores a claim feature, and then attempts to build a case for obviousness based on ignoring that claim feature, the Petition fails to establish *prima facie* obviousness of independent claims 1 and 11. In this regard, even if the allegation of the Petition were taken as true (i.e., that Miura and/or Agee disclose beam steering via software), the accepted truth of the allegation would still not establish that the claims as actually presented (not as watered down by the oversimplified alleged plain and ordinary meaning) are obvious. Petitioner has only attempted to build a case that something less than that which is claimed is shown in the prior art. Even if successful in establishing the same, such success is nevertheless a failure to establish *prima facie* obviousness of independent claims 1 and 11, since independent claims 1 and 11, as actually presented, require more than that which Petitioner has attempted to demonstrate is shown in the prior art.

In spite of this failure, any combination of Miura and Agee also fails to render claims 1 and 11 obvious in any case. In this regard, even if it is again assumed that one or both of Miura and Agee teach or suggest steering beams using software, there is still nothing in either Miura or Agee to teach or suggest going beyond the use of software in beam steering and employing a radio configured via software defined

radio to utilize beamforming to generate a plurality of steerable beams as required by independent claims 1 and 11.

Petitioner's Expert states at ¶91 of Ex. 1002 that "Miura teaches a software defined radio as evidenced by consistent reference to 'electronic scanning' array antennas (as opposed to 'mechanical scanning' arrays) in which 'a digital beam forming system that performs orientation control using *digital signal processing* may be used'" citing to ¶ [0042] of Ex. 1006/1007 with emphasis added. However, neither this passage of Miura, nor any other passage of Miura, teaches a software defined radio, much less use of software defined radio in beamforming or steering beams.

Electronic scanning is not an inherent or equivalent function of software defined radio. Ex. 2001, ¶69. Similarly, neither digital beam forming nor digital signal processing are inherent or equivalent functions of software defined radio. Ex. 2001, ¶¶71, 74. To the contrary, electronic scanning, digital beam forming and digital signal processing are all techniques that are possible with or without any relationship to software defined radio, and none of such terms necessarily imply any relationship with or existence of software defined radio. Ex. 2001, ¶¶71-72, 74. Indeed, as noted above, software defined radio is characterized by structure, and not function. More particularly, software defined radio is characterized by the radio componentry that is implemented using software instead of hardware, and has

specific requirements on the componentry of the physical layer of the radio. Ex. 2001, ¶48. Although electronic scanning, digital beam forming, and digital signal processing are functions that may be achieved using software in a radio where the componentry is implemented in hardware, none of those functions is suggestive, by virtue of its performance including the use of software, of implementation using components embodied in software instead of hardware in the physical layer. Ex. 2001, ¶¶71-72, 74. Thus, none of these functions, even if fully admitted to be performed using software in Miura, can be argued to teach or suggest employment of software defined radio to execute those same functions. Miura is simply silent as to the use of software defined radio, both explicitly and by any implication.

Additionally, the other passages of Miura that are cited as further evidence of Miura's employment of software, are at best only evidence of the use of software, but not of software defined radio. In this regard, Petitioner's Expert cites passages of Miura that recite the word "function" (i.e., Ex. 1006/1007, ¶0039) as alleged evidence that Miura must relate to software since the word "function" is alleged to be recognized as being "used extensively when discussing software." Ex. 1002, ¶91. As an initial matter, the point being made is incorrect in that numerous "functions" are performed using hardware (or even mechanical devices), and not software, in a variety of contexts. Therefore the term "function" does not necessarily invite the interpretation that the activities associated therewith must be performed in software,

and it is simply false to allege as much on its face. Nevertheless, even this passage of Miura is actually relied upon by Petitioner and Petitioner's Expert only to demonstrate that Miura teaches the use of software to steer beams, and it is therefore also only through the improper assumption that using software to steer beams is equivalent to a radio configured via software defined radio to utilize beamforming (which it is not) that leads Petitioner to incorrectly suggest the ultimate conclusion that Miura teaches the claimed feature of independent claims 1 and 11 of the '947 patent. Accordingly, even if it is assumed, arguendo, that Miura does suggest that software is used to steer a beam as alleged by Petitioner, the assumption can be granted fully and still Miura fails to provide any teaching or suggestion regarding the structure (i.e., physical layer componentry) used to perform the function including software defined radio. More particularly, Miura fails to teach or suggest "a radio configured using physical layer elements (including mixers, filters, amplifiers, modulators/demodulators, detectors, etc.), which are typically implemented in hardware, using software that is implemented on a programmed computer or embedded system in order to form and/or steer radio waves in a particular direction" as a POSA would understand the claimed feature to mean. *See*, Ex. 2001, ¶56. As such, Miura also fails to teach or suggest "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as recited in independent claims 1 and 11.

Petitioner treats Agee in the same way IEEE-2004 and Miura were treated. In this regard, Petitioner effectively only presents evidence to establish that Agee teaches using software to steer beams. In particular, Petitioner Expert cites passages of Agee that refer to spatially separated beams, digital beamforming and digital signal processing concluding that a POSA would understand this disclosure of Agee to mean that software is used to steer a beam. Ex. 1002, ¶93.

Again, even if it is assumed, arguendo, that Agee does suggest that software is used to steer a beam as alleged by Petitioner, the assumption can be granted fully and still Agee fails to provide any teaching or suggestion regarding the structure used to perform the function including software defined radio. Moreover, quite to the contrary, Agee explicitly indicates at numerous locations throughout its disclosure that hardware is used (sometimes with software, but importantly such software is never expressed or implied to be in the physical layer of the radio) to implement the system described therein. In this regard, Agee discusses a conundrum that exists in complex systems in which detailed network control steals capacity from the network. Agee further expressly states that "[a]utomation, or turning signal processing into hardware, cannot by itself resolve this conundrum." Ex. 1008, ¶100. Agee discusses how the prior art addresses this problem, and the cited passages from the Petition (i.e., ¶¶107-108) related to one prior art solution involving spatial separation of signals. However, the solution of Agee does not in any way involve

the use of software defined radios, much less doing so in a context involving beamforming. To the contrary, Agee discusses a multiple-input, multiple-output (MIMO) environment in which multiple dimensions of differentiation (spatial, frequency, time, and code) along with other technology advances have provided a diversity explosion. Ex. 1008, ¶240. Agee only begins to define its own advances in the paragraphs after this (see especially disclosures after ¶249). However, even Agee's mention of beamforming in a highly complex MIMO environment does not describe the use of software defined radio either explicitly or implicitly. Moreover, Agee's mentions of software used in connection with hardware (e.g., at ¶¶193 and 242 of Agee) are provided in situations that clearly implicate hardware radio at the physical layer. Ex. 2001, ¶78.

The Petitioner's treatment of Agee therefore not only suffers from the same false assumption of equivalence between the term "software" and "software defined radio," but in fact Agee is quite clear in describing only the use of hardware in connection with physical layer functions. Accordingly, Agee fails to teach or suggest "a radio configured using physical layer elements (including mixers, filters, amplifiers, modulators/demodulators, detectors, etc.), which are typically implemented in hardware, using software that is implemented on a programmed computer or embedded system in order to form and/or steer radio waves in a particular direction" as a POSA would understand the claimed feature to mean. *See*,

Ex. 2001, ¶56. As such, Agee also fails to teach or suggest "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as recited in independent claims 1 and 11.

Since both Miura and Agee fail to teach or suggest "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as recited in independent claims 1 and 11, any combination of Miura and Agee cannot render independent claims 1 and 11 unpatentable. As such, the Petition fails to establish a reasonable likelihood of prevailing with respect to Ground 4, and the Board should deny institution of *inter partes* review in relation to Ground 4 as well.

Patent Owner believes that Miura and Agee also fail to teach or suggest other features of numerous claims of the '947 patent. Moreover, Patent Owner believes that a fully developed record of evidence detailing these failures will be established if *inter partes* review is instituted in this case. However, *inter partes* review should not be instituted on Ground 4 based on the clear failure of Miura and Agee to teach or suggest at least the feature of "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as required in independent claims 1 and 11 of the '947 patent.

D. Grounds 5-7

As noted above, Miura and Agee fail to teach or suggest at least one feature of independent claims 1 and 11. Grounds 5-7 each also rely on Miura and Agee with respect to the same missing feature, but combine additional references (namely Holst, Xu and DiFonzo) to disclose additional dependent claim features.

Neither Petitioner nor Petitioner's Expert alleges that Holst, Xu or DiFonzo provide any teaching or suggestion of "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as required in independent claims 1 and 11 of the '947 patent. Moreover, as noted by Patent Owner's Expert, none of Holst, Xu and DiFonzo provides any express or inherent disclosure regarding software defined radio, much less "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams" as required in independent claims 1 and 11 of the '947 patent. Ex. 2001, ¶¶80, 84, 88. Accordingly, Holst, Xu and DiFonzo cannot cure the above-noted deficiencies of Miura and Agee in relation to this feature. Additionally, the Petition fails to make the case that it would have been obvious to a POSA at the time of filing of original disclosure corresponding to the '947 patent, based on an assumption that Miura and/or Agee discloses using software for beamforming, to employ a radio configured via software defined radio to perform such beamforming. Finally, as noted by Patent Owner's Expert, no such conclusion of obviousness could be made

in any case. Ex. 2001, ¶¶96-98. The Petition therefore also fails to demonstrate a reasonable likelihood of success in prevailing relative to the challenges articulated in Grounds 5-7. Accordingly, *inter partes* review should not be instituted be instituted relative to Grounds 5-7.

VI. The PTAB Should Exercise Its Discretion to Deny Institution as Petitioner Submits the Same or Substantially the Same Prior Art and Arguments Previously Presented to the Patent Office.

The Board has discretion to deny institution of review for a petition presenting grounds that are substantially the same as the prior art or arguments previously presented to the Office during prosecution. 35 U.S.C. § 325(d) ("In determining whether to institute or order a proceeding . . . the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office."). To guide this analysis, the Board considers several non-exclusive factors when determining whether to exercise its discretion to deny institution under § 325(d). These factors are articulated in *Becton*, and are referred to herein as the *Becton* factors. *Becton*, paper 8 at 17-18.

The *Becton* factors include: (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination;

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in his evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. *See Id*.

First, Petitioner failed to even address the *Becton* factors at all. Second, as shown below in connection with reviewing the *Becton* factors, Petitioner offers nothing of substance to demonstrate that the Petition includes anything beyond what the Examiner already considered during prosecution of the patents. Nowhere does Petitioner point out any prosecution errors, changed claim constructions, or other material evidence that justifies resurrecting substantially similar art and arguments already fully considered by the Examiner.

As mentioned above, DiFonzo and Xu already were considered during prosecution of the '947 patent. Petitioner has not shown why IEEE-2004, Miura, Agee and/or Holst provide any new teaching as compared to the voluminous art already before the Examiner. Thus, the addition of either IEEE-2004, Miura, Agee and/or Holst to references already before the Examiner does nothing to advance the

allegation that any claims of the '947 patent are not patentable over the body of prior art that the Examiner considered in determining patentability of the '947 patent.

Furthermore, DiFonzo was actually considered more extensively by the Examiner, and used in connection with articulating rejections of more claims, than the degree to which Petitioner now uses DiFonzo. However, Petitioner has not explained why Miura, Agee and/or Holst are superior to DiFonzo in such a way that caused Petitioner to back away from using DiFonzo to articulate rejections of some claims, but not others.

To the extent the addition of IEEE-2004, Miura, Agee and/or Holst should have made any difference to the Examiner, Petitioner should have informed the Board of the differences between IEEE-2004, Miura, Agee and/or Holst and references previously considered to demonstrate why IEEE-2004, Miura, Agee and/or Holst are superior to the previously considered art to support a rejection. However, Petitioner did not, and based on a proper weighing of the *Becton* factors, the Board should exercise its discretion to deny institution because the same or substantially the same prior art and arguments have been previously presented to the Office.

A. The similarities and material differences between the asserted art and the prior art involved during examination of the '947 patent

No material differences between the asserted art and the prior art considered during examination have been alleged by Petitioner. Instead, Petitioner cursorily suggests that, with respect to its proposed grounds that "[a]ll of the claimed features are present in the prior art described in this petition-prior art which the United States Patent and Trademark Office (the 'Office') never considered before issuing the '947 Patent." Petition at 1. However, DiFonzo and Xu were clearly considered before by the Examiner during prosecution of the '947 patent rendering the statement above patently false. Ex. 1012 at 397, 407. Petitioner also states, at page 21 of the Petition, that "[u]nlike the prior art at issue during prosecution, the references discussed in this petition specifically relate to continuous and uninterrupted data communications …" thereby again suggesting that none of the references employed in the various grounds of rejection set forth in the petition were already considered by the Office. These assertions are equally incorrect and deceptive. Moreover, although the combinations of references forming the proposed Grounds of rejection listed in the Petition are new, there is neither any new content in these references relative to that which the Examiner already considered, nor has Petitioner made any effort to demonstrate as much. Instead, the Petition is merely a series of weakly supported

alternative theories of unpatentability that are not distinct from those the Examiner considered during prosecution of the '947 patent.

IEEE-2004 can perhaps be persuasively argued to not be "similar" to the prior art considered during examination of the '947 patent. However, such lack of similarity is due only to the fact that the material differences between IEEE-2004 and the prior art considered during examination of the '947 patent clearly demonstrate that IEEE-2004 is far less pertinent to that which is claimed than anything the Examiner considered during examination of the '947 patent. In this regard, in addition to other deficiencies noted above, IEEE-2004 fails to disclose any communication links with in-flight communication nodes at all. Ex. 2001, ¶62. The other vague references of IEEE-2004 to steering beams using software are also clearly not descriptive of the use of software defined radio for configuration of a radio to conduct beamforming in the manner claimed.

Accordingly, to whatever degree IEEE-2004 is dissimilar from the prior art considered during examination of the '947 patent, such dissimilarities actually render the proposed Grounds of unpatentability of the claims of the '947 patent that are based on IEEE-2004 inferior even to the grounds overcome by Patent Owner in relation to obtaining issuance of the '947 patent. In particular, the material dissimilarities between IEEE-2004 and the actually more pertinent references

considered by the Examiner render Ground 1, which solely relies on IEEE-2004, cause this *Becton* factor to lean heavily toward denying institution.

As noted above, DiFonzo and Xu were clearly considered before by the Examiner during prosecution of the '947 patent, and for the same claims to which their correspondence is made in the Petition. Thus, IEEE-2004 in combination with DiFonzo and Xu, is only dissimilar from combinations considered during prosecution of the '947 patent in ways that demonstrate the inferiority of the proposed combination to the grounds overcome by Patent Owner in relation to obtaining issuance of the '947 patent. Thus, this *Becton* factor also leans heavily toward denying institution for Grounds 2 and 3, which rely on IEEE-2004 in combination with Xu and DiFonzo, respectively.

In the final Office Action of March 10, 2015, the Examiner relied upon Gresham as disclosing all of the features of claims 1 and 11 except for "high speed data communication links," which were alleged to be disclosed by Rhoads, and "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams, to enable multiple reuses of a same frequency to communicate with respective different in-flight communication nodes via respective different communication links," which was alleged to be disclosed in DiFonzo. Ex. 1012, at 454. In this regard, the Examiner considered DiFonzo's references to a controller that "directs the hub node to point a steerable beam in the directions with

particular remote users" (Ex. 1012 at 454) to correspond to the above quoted passage of independent claims 1 and 11.

The Petition appears to allege that Miura teaches or suggests all of the features of independent claims 1 and 11, but acknowledges that Miura does not use the words "software defined radio." Petition at 44. In case the Board decides that Miura does not teach or suggest such feature by virtue of the vague references in Miura to "electronic scanning" (which notably does not teach or suggest beamforming via configuration of a radio via software defined radio, as noted above and at Ex. 2001, ¶69), the Petition alleges that Agee would fill such gap. Thus, for Grounds 4-7, the Petition uses Agee in a manner similar to how the Examiner used DiFonzo, and basically uses Miura in a manner similar to how the Examiner used the combination of Gresham and DiFonzo during prosecution of the '947 patent.

However, Petitioner does not expend any energy to demonstrate how Miura is superior to Gresham and DiFonzo, or Agee is superior to DiFonzo. Moreover, there is no evidence to support such a conclusion in any case. As noted above, Agee merely references general disclosures relating to beam forming using software, but the core teachings of Agee are descriptive of details not germane to patentability of the claims of the '947 patent. Moreover, these disclosures of Agee are provided in no more detail than those of DiFonzo, and are not alleged as such. Similarly, Miura also simply provides general references to beam forming using software in a

handover context. Miura does not disclose anything Gresham and DiFonzo lacked and no such comparison has been made by Petitioner beyond the blanket (and incorrect and deceptive) statement noted above. Accordingly, this Becton factor weighs in favor of denying institution of *inter partes* review.

During the prosecution of the '947 patent, the Examiner considered prior art that is the same (i.e., Xu and DiFonzo) or substantially the same art to Gresham and Rhoads (e.g., Miura, Agee and Holst). Specifically, DiFonzo, Gresham and Rhoads, which the Examiner considered during prosecution, each disclose substantially the same subject matter for which Miura, Agee and Holst are relied on in the Petition. Furthermore, Petitioner failed to provide any analysis of the differences between Miura, Agee and Holst and the references already considered by the Examiner beyond inaccurate and false statements, as noted above. Below is a table showing the different grounds and the art relied on by Petitioner as compared to that already fully considered by the Examiner.

Grounds 1-3		
Reference	*Considered by Patent Office During Prosecution*	*Substantially Same As Prior Art Reference*
IEEE-2004	NO	At best similar to Gresham, but decidedly inferior
Xu	YES *see, e.g.*, Ex. 1012 at 407.	Considered
DiFonzo	YES *see, e.g.*, Ex. 1012 at 397.	Considered
Grounds 4-7		

Reference	*Considered by Patent Office During Prosecution*	*Substantially Same As Prior Art Reference (Examples)*
Miura	NO	Gresham/DiFonzo
Agee	NO	DiFonzo
Xu	YES *see, e.g.*, Ex. 1012 at 407.	Considered
DiFonzo	YES *see, e.g.*, Ex. 1012 at 397.	Considered
Holst	NO	Considered, but also the same as DiFonzo

Significantly, the Examiner found that neither Xu nor DiFonzo, nor any other reference similar to Gresham, Rhoads and other cited references disclosed or taught several key elements of the challenged claims that are essential for Petitioner's unpatentability arguments.

Petitioner has made no attempt to address that the Examiner considered Xu and DiFonzo already, and references similar to DiFonzo, Gresham and Rhoads. In fact, Petitioner's only attempt to address the relevant prosecution history is to make the incorrect and misleading statements noted above. Nowhere does Petitioner's Expert or the Petition provide persuasive facts, data, or analysis to support a conclusion that the newly presented references warrant reconsideration of the prior art and arguments presented earlier to the Examiner. Furthermore, Petitioner fails to identify any meaningful differences between the references relied on by the Examiner and the references cited by Petitioner that warrant institution of this proceeding. Thus, the art relied upon by Petitioner in articulating the proposed

Grounds of rejection put forth in the Petition lacks any meaningful differences from what already was before the Office. Therefore, this particular *Becton* factor weighs strongly in favor of denying institution.

B. The cumulative nature of the asserted art and the prior art evaluated during examination of the '947 patent

The art asserted in the Petition is also cumulative of the prior art evaluated during examination. As discussed above, Petitioner relies on some of the same prior art that the Examiner already considered during prosecution of the '947 patent – namely, DiFonzo and Xu. Moreover, as shown above, Petitioner fails to address how IEEE-2004, Miura, Agee and Holst are different from any of the references considered by the Examiner during prosecution.

Petitioner's only attempt at addressing these issues is by issuing deceptive and inaccurate statements about all of the prior art having not previously been considered. In this regard, although Petitioner noted that the Examiner stated when allowing the '947 patent claims that "the prior art of record either individually or in combination does not disclose or fairly suggest the features of claim 1 [and] 11, as further detailed in Appeal Brief." Petition at 21, referring to Ex. 1012 at 501. Petitioner nevertheless stated that "[u]nlike the prior art at issue during prosecution, the references discussed in this petition specifically relate to continuous and uninterrupted data communications when in-flight aircraft transition between

coverage areas defined by steerable beams." Petition at 21. These two statements cannot be reconciled in light of the fact that both DiFonzo and Xu were considered by the Examiner and discussed in the Appeal Brief. Moreover, as noted above IEEE-2004 also lacks any relevant teachings related to communications with in-flight aircraft. Petitioner also makes no effort to address why the grounds asserted are not based on references that are cumulative of the prior art already considered by the Office. That said, even though some prior art was previously considered by the Examiner, the combinations of references proposed by Petitioner are new.

However, whether grounds of unpatentability are cumulative of issues previously presented is not answered merely by the fact that a specific combination was not expressly addressed by the Office. If a combination was necessarily not cumulative by virtue of that fact, there could logically not be any such thing as a new reference in a combination that is cumulative. Determining whether a combination represents grounds that are cumulative requires a deeper analysis, and one that Petitioner made no investment in.

Since it is well defined as to what constitutes a cumulative reference under the patent laws, Petitioner should have demonstrated that the references are not cumulative and supported the assertion that the proposed grounds are not cumulative of prior art of record with evidence demonstrating how any reference in the proposed grounds would not be considered cumulative under the corresponding legal

definition of the term. Specifically, the Federal Circuit has defined a cumulative reference as a reference that "teaches no more than what a reasonable examiner would consider to be taught by the prior art already before the PTO." *Regents of the Univ. of Cal. v. Eli Lilly & Co*., 119 F.3d 1559, 1575 (Fed. Cir. 1997). Petitioner has not conceded that DiFonzo and Xu were considered by the Examiner during prosecution of the '947 patent, and neither Petitioner nor Petitioner's Expert made any comparative assessment regarding whether IEEE-2004, Miura, Agee or Holst taught any more than what a reasonable examiner would consider to be taught by the prior art already before the Office. Petitioner's failure to make any effort to compare IEEE-2004, Miura, Agee and Holst to the prior art already before the Office is itself evidence that Petitioner cannot show that these references (and the combinations that rely on them) are not cumulative of prior art of record. Furthermore, Petitioner's expert testimony is also silent as to how IEEE-2004, Miura, Agee and Holst should have caused the Examiner to reach a different conclusion regarding patentability of the '947 patent. Thus, this *Becton* factor also weighs in favor of denying institution.

C. The extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection

While the specific combinations in the proposed grounds were not expressly used in a rejection of the claimed subject matter during prosecution, two of the

references, DiFonzo and Xu, were considered by the Examiner in the prosecution of the '947 patent. Ex. 1012 at 397, 407. Furthermore, DiFonzo and Xu are used in connection with proposing grounds of rejection on the same claims for which the Examiner considered DiFonzo and Xu. As noted above, the other references are cumulative. Therefore, the combinations of references considered by the Examiner and rejections articulated during examination of '947 patent do not show any notable differences relative to the asserted art, and Petitioner has not asserted any such notable differences. Accordingly, the similarity of the references considered (as discussed above) prevents any substantial weight in favor of institution from being conferred by this factor.

D. The extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art

There is necessarily overlap between the arguments or prior art asserted during examination and the manner in which Petitioner relies on the prior art by virtue of the fact that, as noted above, the Examiner considered DiFonzo and Xu during examination of the '947 patent. Ex. 1012 at 397, 407. The references to vague disclosures of the other cited references (i.e., IEEE-2004, Miura, Agee and Holst) without any indication of better correlation to the claimed subject matter than that which was provided by the art already considered during examination of the '947

patent amount to nothing more than facially new arguments without any substantive newness.

Accordingly, no substantial weight in favor of granting institution can be conferred by this *Becton* factor.

E. Whether Petitioner has pointed out sufficiently how the Examiner erred

As Patent Owner has previously noted, Petitioner fails to even attempt to allege any apparent errors from the prosecution history of the '947 patent or submit any arguments as to how the Examiner erred in his determination to allow the '947 patent. (*See* Petition generally). Notably, Petitioner also fails to address whether or how the Examiner erred in evaluating the asserted prior art that is the same art (DiFonzo and Xu) or substantially similar art (IEEE-2004, Miura, Agee and Holst) that the Examiner considered during prosecution. Given that Petitioner failed to make any case of Examiner error, this *Becton* factor weighs heavily in favor of denying institution.

F. The extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments

Petitioner's expert declaration does not add anything of substance. Instead, the declaration provides no additional evidence or facts, but rather merely states vague grounds of unpatentability that are in no way demonstrated to be superior to

those presented during prosecution, albeit now from the mouth of an alleged expert. The use of appeal to authority, or *argumentum ad verecundiam*, in this context employs nothing more than the claimed authority's support as evidence for the argument's conclusion. This well-known logical fallacy should, without further evidence, not be given any weight. Accordingly, given that the only weight offered to support the arguments in this case is the opinion of the witness itself, without any further evidence, the weight given to the opinion should be very low.

Notably, even this expert testimony is silent as to how IEEE-2004, Miura, Agee and Holst add anything to the body of prior art that was before the Examiner, which should have caused the Examiner to reach a different conclusion regarding patentability of the ‘947 patent if the Examiner had possession of such references. The testimony also fails to point out how the Examiner erred in evaluating the body of prior art that was before the Examiner, which body of prior art has not been distinguished from the teachings of IEEE-2004, Miura, Agee and Holst. As such, the Petition provides nothing beyond an inaccurate and deceptive allegation that all of the prior art relied on in the Petition is new.

Petitioner’s expert further did not make any assessment regarding whether IEEE-2004, Miura, Agee and Holst taught any more than what a reasonable examiner would consider to be taught by the prior art already before the Office. Nor did he explain why IEEE-2004, Miura, Agee and Holst are materially different from

what the Examiner already considered. Petitioner's expert also fails to explain how IEEE-2004, Miura, Agee and Holst add anything beyond that which was already taught by references already considered by the Office. In short, Petitioner's Expert provided no facts or evidence to indicate why Petitioner's Grounds are in any way superior, or even different, to the grounds the Examiner already articulated or could have been formulated during prosecution of the '947 patent. Instead, Petitioner's expert merely provided conclusory statements regarding a combination of references that are cumulative of prior art already considered by the Examiner, whereas Patent Owner's Expert notably based his opinion on valid extrinsic evidence. Thus, the testimony of Petitioner's Expert does not rise to the level of evidence and facts that warrant reconsideration of the prior art or arguments already considered by the Examiner. Petitioner merely provided alternative theories of unpatentability without any logical explanation as to why the alternative theories work better than those already considered by the Examiner and without any demonstration as to how the Examiner should have thought differently about the prior art he considered. As a result, this *Becton* factor also weighs in favor of denying institution.

VII. Conclusion

Petitioner has failed to demonstrate a reasonable likelihood of success in prevailing relative to the challenges articulated in relation to any of the articulated Grounds of unpatentability. Moreover, Petitioner has failed to demonstrate why the

Board should not exercise discretion to dismiss the Petition based on the *Becton* factors. Thus, the Board should deny this petition outright as Petitioner has not pointed out any prosecution errors, changed claim constructions, or other material evidence that justifies resurrecting questions of patentability already fully considered by the Examiner.

In light of the foregoing, Patent Owner respectfully requests that the Board exercise its discretion pursuant to 35 U.S.C. §314 and/or § 325(d) to reject all proposed grounds of institution.

Date: June 22, 2020

Respectfully submitted,

By: /Chad L. Thorson/
Chad L. Thorson (Reg. No. 55675)
Lead Counsel for Patent Owner

CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing **Patent Owner's Preliminary Response** excluding any table of contents, table of authorities, certificates of service or word count, or appendix of exhibits or claim listing, contains 12,161 words according to the word-processing program used to prepare this paper (Microsoft Word).

Date: June 22, 2020

Respectfully submitted,

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CERTIFICATE OF SERVICE

It is certified that a copy of the **Patent Owner's Preliminary Response** has been served on Petitioner as provided in 37 C.F.R. § 42.6(e) via electronic mail transmission addressed to the persons at the addresses below:

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