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14 **UNITED STATES DISTRICT COURT**
15 **SOUTHERN DISTRICT OF CALIFORNIA**

16 VIASAT, INC.,

17 Plaintiff,
18 vs.

19 SPACE SYSTEMS/LORAL, INC.,
LORAL SPACE &
COMMUNICATIONS INC.,

20 Defendants/Counterclaim
21 Plaintiffs.

Case No. 3:12-cv-00260-H-WVG
Hon. Marilyn L. Huff

**DEFENDANTS' MOTION FOR
JUDGMENT AS A MATTER OF
LAW (RENEWED), OR A NEW
TRIAL (10 OF 12), REGARDING
THE INVALIDITY OF THE
ASSERTED CLAIMS OF THE '827
AND '875 PATENTS IN LIGHT OF
THE PRIOR ART**

22
23 Date: July 22, 2014
Time: 9:00 a.m.
24 Place: Courtroom 15A

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1 Defendants Space Systems/Loral, LLC and Loral Space & Communications
2 Inc. (collectively, "SS/L") renew their motion for entry of judgment as a matter of
3 law that the asserted claims of U.S. Patent Nos. No. 8,068,827 ("the '827 patent")
4 and 8,107,875 (the "'875 patent") are invalid in light of the prior art. Alternatively,
5 SS/L moves for a new trial.¹

6 I. INTRODUCTION

7 SS/L has filed separate motions requesting entry of judgment as a matter of
8 law ("JMOL") that (1) the '827 patent is invalid for improper inventorship and (2)
9 the '875 patent is invalidated by ViaSat-1 because the patent's earliest priority date
10 is March 2009. SS/L further submits the following motion for JMOL that (1) Claim
11 7 of the '827 patent is invalid as anticipated and obvious in light of the prior art and
12 (2) even assuming a 2006 priority date, Claim 12 of the '875 patent is invalid as
13 obvious in light of the prior art. Clear and convincing evidence demonstrates that
14 these claims are invalid, and no substantial evidence supports the jury's finding to
15 the contrary.

16 II. LEGAL STANDARD

17 Judgment as a matter of law may be granted and a jury verdict can be
18 overturned "if the evidence, construed in the light most favorable to the nonmoving
19 party, permits only one reasonable conclusion, and that conclusion is contrary to the
20 jury's verdict." *Lucent Techs., Inc. v. Gateway Inc.*, 580 F.3d 1301, 1309 (Fed. Cir.
21 2009) (quoting *Pavao v. Pagay*, 307 F.3d 915, 918 (9th Cir. 2002)). "[O]n posttrial

22 ¹ SS/L hereby moves for judgment as a matter of law pursuant to Rule 50(a) and,
23 pursuant to Rule 50(b), renews the motion for JMOL that it made before the close
24 of evidence. Alternatively, SS/L moves for a new trial pursuant to Rule 59.

JMOL motions, district court judges must scrutinize the evidence carefully to ensure that the 'substantial evidence' standard is satisfied." *Id.* at 1336. Substantial evidence is "more than a mere scintilla" and is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *The Johns Hopkins Univ. v. Datascope Corp.*, 543 F.3d 1342, 1348 (Fed. Cir. 2008) (quotation marks and citation omitted). "Under Rule 50, a court should render judgment as a matter of law when a party has been fully heard on an issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue." *Reeves v. Sanderson Plumbing Prods.*, 530 U.S. 133, 149 (2000).

III. ARGUMENT

A. SS/L is Entitled to JMOL that the '827 Patent's Claim 7 is Invalid.

As construed by the Court, the '827 patent claims a GSO (geostationary) satellite that uses the NGSO spectrum on an opportunistic basis, using circuitry to select and a transmitter to transmit in either the extended frequency spectrum mode (*i.e.*, GSO and NGSO) or the GSO frequency spectrum mode "based on information indicating a presence or an absence of an interference situation with an NGSO satellite system." For purposes of this motion, SS/L submits that the claim is invalidated by prior art even under the Court's construction.²

1. AtContact (2004) Anticipates Claim 7.

On March 22, 2004, AtContact filed an amendment to a previous FCC application, seeking an FCC license to certain GSO and NGSO spectrum for use in

² SS/L separately renews its motion for JMOL that the '827 patent is indefinite and, alternatively, that Jupiter does not infringe under any appropriate construction. Nothing herein is meant to waive SS/L's arguments raised elsewhere regarding the appropriate construction, if any, of the '827 patent.

1 a fleet including four GSO satellites. *See generally* Bonn Decl. Ex. A. On July 19,
2 2004, at the FCC's request, AtContact filed a supplement to its application, stating
3 that "[t]his information supplements, and is to be considered in conjunction with,
4 the technical information and showings . . . that are contained in @contact's March
5 22, 2004 amendment filing." *See* Ex. B at SSL0083492. Thus, the July 2004
6 supplement incorporated by reference the March 2004 filing and the two must be
7 treated as a single reference for anticipation purposes. *See Adv. Display Sys., Inc. v.*
8 *Kent State Univ.*, 212 F.3d 1272, 1283-84 (Fed. Cir. 2000) (holding "incorporation
9 by reference is a question of law while anticipation is a question of fact").

10 "A patent is invalid for anticipation if a single prior art references discloses
11 each and every limitation of the claimed invention." *Schering Corp. v. Geneva*
12 *Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003). The reference must "expressly
13 or inherently" disclose every limitation. *Id.* The testimony of Professor Schindall,
14 along with Exhibits A and B, establish that each and every element of Claim 7 of
15 the '827 patent is disclosed in and thereby anticipated by AtContact (2004), as
16 shown in the chart set forth in Appendix 1. Faced with overwhelming evidence that
17 AtContact anticipates Claim 7, ViaSat attempted to rely on three purported
18 distinctions—none of which constitutes substantial evidence to the contrary.

19 First, Mr. Sturza admitted that AtContact discloses an "NGSO payload on a
20 geosynchronous orbit [GSO] satellite," and that "[w]hen there would be
21 interference, the AtContact NGSO would turn off." *E.g.*, Trial Tr. at 2721
22 (emphasis added). Mr. Sturza testified that the presence of a switch on Jupiter that
23 was capable of turning off the NGSO spectrum during in-line interference events
24

1 for any reason would suffice to establish infringement. *See, e.g.*, Trial Tr. at 1701-
2 09. "That which infringes if later anticipates if earlier." *Polaroid Corp. v. Eastman*
3 *Kodak Co.*, 789 F.2d 1556, 1573 (Fed. Cir. 1986). ViaSat cannot have it both
4 ways—if the switch in Jupiter that is merely capable of switching NGSO spectrum
5 off during in-line interference events suffices to establish infringement, then
6 AtContact anticipates Claim 7.

7 Second, Mr. Sturza testified that AtContact discloses seven satellites and not
8 just one. *E.g.*, Trial Tr. at 2723. That point is legally irrelevant—Claim 7 is a
9 comprising claim and is therefore anticipated if one satellite practices every element
10 of the claim, notwithstanding that there may also be other satellites as well. *Stiftung*
11 *v. Renishaw PLC*, 945 F.2d 1173, 1178 (Fed. Cir. 1991) (holding a "comprising" or
12 "open" claim "will read on devices which add additional elements").

13 Third, Mr. Sturza argued that AtContact does not disclose "NGSO blanking"
14 and that the ViaSat FCC application "is the first application that talked about the
15 NGSO blanking." *E.g.*, Trial Tr. at 2723. The phrase "blanking" is apparently a new
16 one ViaSat concocted for purposes of trial—the term appears nowhere in the '827
17 patent or ViaSat's FCC application for that matter.³ It is irrelevant that this invented
18 phrase does not appear in AtContact. What matters is that circuitry that would turn
19 off NGSO transmissions "during" in-line interference events is disclosed (and,
20 indeed, ViaSat copied that very language in its own FCC filing):

21 ³ It appears that ViaSat decided to change its terminology regarding this patent from
22 "dynamic switching" to "dynamic blanking" because, as it turns out, ViaSat does
23 not have a single internal document showing it had conceived of an NGSO switch
24 before SS/L presented the Flexible Frequency Plan to ViaSat on September 19,
2007. *See* SS/L's JMOL re Inventorship of the '827 Patent.

AtContact FCC Supplement (2004)	ViaSat FCC Application (June 2008)
"@contact is prepared to and has the <u>capability ... to cease their transmissions in the 18.8-19.3 GHz and 28.6-29.1 GHz bands</u> to avoid causing such interference . . . <u>during the 'in-line' interference events</u> with the non-@contact non-GSO satellites."	"[T]he satellite has been designed with the <u>capability to cease operations in the 18.8 to 19.3 GHz downlink band and in the associated 28.6-29.1 GHz uplink band</u> ... where ... the two satellite networks would be equal to or less than a specified minimum <u>line-of-sight separation angle</u>."
Ex. B at SSL0083519.	Ex. M at Hughes-166786.

There is simply no substantial evidence supporting the jury's verdict that Claim 7 is not anticipated by AtContact (2004). To the extent that any limitation is missing from AtContact, it would have been obvious to combine it with the other prior art discussed below.⁴

2. SS/L Established a Strong Prima Facie Case of Obviousness.

A patent is obvious "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103. "While a jury may render a decision on a question of obviousness when it is considering any underlying fact questions, obviousness is ultimately a question of law" *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 990 (Fed. Cir. 2009). "When [the court] consider[s] that, even in light of a jury's finding of fact, the references

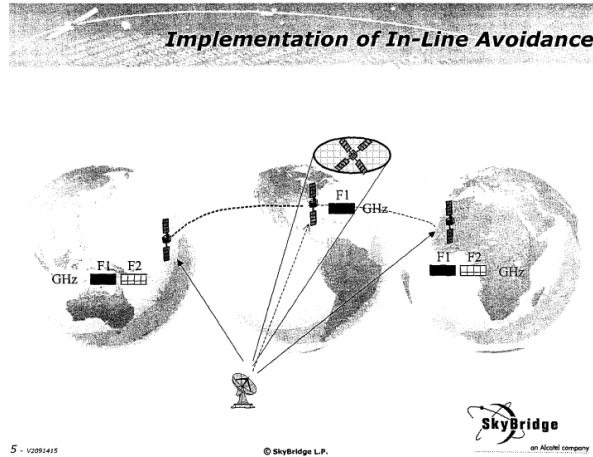
⁴ Likewise, to the extent the Court finds that the AtContact Supplement did not incorporate by reference the AtContact Amendment such that they can be treated as a single reference for anticipation, one of ordinary skill in the art would nevertheless be motivated to combine them with each other (and/or with the additional prior art discussed below) to render Claim 7 obvious.

1 demonstrate an invention to have been obvious, [the court] may reverse its
2 obviousness determination." *Id.* "The combination of familiar elements according to
3 known methods is likely to be obvious when it does no more than yield predictable
4 results. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

5 In addition to the AtContact filings discussed above, the FCC's Third Report
6 & Order published in 1997 ("FCC Rules") renders Claim 7 obvious. Ex. C. The
7 FCC Rules are printed publication prior art under §§ 102(a) and 102(b). The
8 testimony of Professor Schindall, along with Exhibit C, demonstrates that the FCC
9 Rules themselves disclose claim limitations 7(a) through 7(d), as shown in the
10 attached Appendix 1. To the extent that the FCC Rules fail to disclose any
11 particular circuitry on the satellite that would accomplish such opportunistic
12 spectrum use, Dr. Schindall explained that it would be obvious to one of ordinary
13 skill in the art to satisfy the FCC's mandate by using circuitry to turn off the NGSO
14 spectrum during in-line interference situations. *See, e.g.*, Trial Tr. at 2279-82, 2288-
15 89.

16 The fact that dynamic spectrum reduction during "in-line interference" events
17 is the obvious method of complying with the FCC's mandate is evidenced by
18 SkyBridge's FCC Ex Parte Application ("Skybridge"). *See generally* Ex. D.
19 Skybridge was a publicly-filed document and thus is printed publication prior art
20 under §§ 102(a) and (b). As Dr. Schindall testified, and as shown in Exhibit D,
21 Skybridge discloses "[a]voidance of in-line events" as a method for achieving
22 "NGSO/NGSO Sharing." *Id.* at SSL0084644-52. It discloses various advantages of
23 the in-line avoidance technique in which an NGSO satellite switches between an
24

1 extended spectrum (two NGSO bands) and a reduced spectrum (one NGSO band)
 2 depending on whether there is an in-line interference event with another NGSO
 3 satellite. See Appendix 1. Skybridge included the below depiction of such an in-line
 4 avoidance technique:



Ex. D at SSL0084653.

Mr. Sturza's only critique of Skybridge as prior art is that (a) it was never built and (b) the extended and reduced spectrum modes are both within the NGSO spectrum (rather than the GSO and NGSO spectrum). *E.g.*, Trial Tr. at 2723-24. As to the first point, it is irrelevant whether a printed publication prior art reference was ever built. *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985) ("It is not, however, necessary that an invention disclosed in a publication shall have actually been made in order to satisfy the enablement requirement.") (emphasis added). As to the second point, Dr. Schindall testified that it would have been obvious to one of ordinary skill in the art that the Skybridge dynamic NGSO switching approach could also be used by a GSO satellite seeking to avoid interference with an NGSO satellite. *E.g.*, Trial Tr. at 2281-82. ViaSat offered no evidence to the contrary.

1 To the extent that either AtContact, the FCC Rules, or Skybridge fails to
2 disclose the particular circuitry on-board a satellite that could be used to accomplish
3 spectrum reduction in the case of in-line interference situations, Dr. Schindall
4 explained that one of ordinary skill in the art could combine any of those references
5 with commonly-known circuitry like switches as disclosed, for example, European
6 Patent Application No. 1,085,680 filed on December 9, 2000 ("Weideman (2000)").
7 *See, e.g.*, Trial Tr. at 2288-89; Ex. E. Weideman is printed publication prior art
8 under §§ 102(a) and 102(b). As Professor Schindall testified, Weideman (2000)
9 discloses an "on-board bandwidth controller" that "provides a means to vary the
10 input filter bandwidth, which may be switched or continuously controlled" in order
11 to accomplish a "change or reduction in bandwidth." *E.g.*, Trial Tr. at 2288; Ex. E
12 at 4:11-17; *see also id.* at Title, Figs. 2A & 7. Mr. Sturza admitted that as long as a
13 reference discloses "four frequency band combinations" using GSO and NGSO
14 spectrum, the "logical way of implementing that is . . . with filters and switches."
15 Trial Tr. at 2734. Mr. Sturza objected that the Weideman patent, in particular,
16 discloses using switches to "sav[e] power on the satellite" rather than for "sharing
17 spectrum." *Id.* But he did not dispute that satellites components like the switches
18 disclosed in Weideman are well-known in the art, nor did he dispute that one of
19 ordinary skill would be motivated to combine such components to accomplish
20 dynamic spectrum reduction.

21 Clear and convincing evidence demonstrates a strong prima facie case of
22 obviousness based on various combinations of prior art, including any or all of the
23 AtContact Applications, the FCC Rules, Skybridge, and/or the Weideman patent.
24

1 ViaSat failed to introduce substantial evidence to the contrary.

2 **3. Secondary Factors Cannot Defeat Obviousness.**

3 Secondary factors cannot save the '827 patent from obviousness. None of
4 ViaSat's generic evidence of praise for ViaSat-1 or its commercial success has any
5 nexus with the purported invention of the '827 patent. To the contrary, it is the fact
6 that the FCC licenses NGSO spectrum to GSO satellite operators that accounts for
7 any increased capacity in ViaSat-1 and not a so-called switch that would allow the
8 spectrum to be shut off in the unlikely event that an interfering NGSO satellite ever
9 launches. As such, the evidence ViaSat attempted to present regarding secondary
10 indicia of nonobviousness do not alter the analysis. *Boston Scientific*, 554 F.3d at
11 991-92 (holding "the weak secondary considerations of nonobviousness do not
12 overcome the strong *prima facie* showing that Wolff renders [the asserted claim]
13 obvious" and "[t]he district court thus incorrectly upheld the jury's verdict of
14 nonobviousness"). The overwhelming evidence is that, at best, Claim 7 of the '827
15 patent is a combination of familiar elements (*i.e.*, GSO satellites using NGSO
16 spectrum on a non-harmful basis), using known methods (*i.e.*, in-line avoidance
17 techniques implemented with common circuitry such as switches and filters), to
18 yield predictable results (*i.e.*, using the spectrum the FCC expressly allocates
19 without risking interference). *KSR Int'l*, 550 U.S. at 415-16.

20 As a result, SS/L is entitled to judgment as a matter of law that Claim 7 of the
21 '827 patent is invalid as anticipated and obvious in light of the prior art.

22 **B. SS/L is Entitled to JMOL that '875 Patent's Claim 12 is Obvious.**

23 Claim 12 of the '875 patent depends from Claim 1. Claim 1 recites, in
24 relevant part, a spot beam satellite (1) configured to receive data "from a plurality

1 of service beams and from at least one feeder beam"; (2) "each service beam having
2 an associated service beam coverage area and the at least one feeder beam having
3 an associated feeder beam coverage area"; (3) "wherein the feeder beam coverage
4 area is proximate to one or more of the service beam coverage areas"; (4) wherein
5 the at least one feeder beam is allocated "different colors" from "a service beam
6 associated with each of the one or more service beam coverage areas proximate to
7 the feeder beam coverage area"; (5) "wherein the feeder beam coverage area is not
8 proximate to one or more of the service beam coverage areas"; and (6) "wherein a
9 set of colors allocated to a service beam associated with each of the one or more
10 service beam coverage areas not proximate to the feeder beam coverage area
11 includes at least one same color allocated to the at least one feeder beam" '875
12 Patent at Claim 1 (emphases added). Claim 12 further recites the spot beam satellite
13 of Claim 1 including "a second at least one feeder beam," where (1) "the second at
14 least one feeder beam [is] associated with a second feeder beam coverage area"; (2)
15 "the second feeder beam coverage area is not proximate to any of the service beam
16 coverage areas"; and (3) "the second at least one feeder beam is allocated all of the
17 colors of the beam pattern." *Id.* at Claim 12. SS/L submits that the Court's
18 constructions of certain claim terms, including "service beam" and "feeder beam"
19 were in error, as set forth in SS/L's *Markman* briefing. Even under the Court's
20 constructions, the prior art renders Claim 12 invalid as obvious. That conclusion is
21 only further substantiated when the prior art is analyzed under the appropriate claim
22 constructions SS/L urged during *Markman* and in its *Daubert* motions regarding
23 Dr. Bartone's testimony.
24

1 **1. SS/L Established a Strong Prima Facie Case of Obviousness.**

2 a. MITRE Discloses Every Limitation of Claim 1.

3 "An FDMA System Concept for 30/20 GHz High Capacity Domestic
4 Satellite Service," published by the MITRE Corporation in 1982, is printed
5 publication prior art under 35 U.S.C. §§ 102(a) and 102(b). *See generally* Ex. F.
6 The testimony of Dr. Schindall, along with Exhibit F, established that each and
7 every element of Claim 1 of the '875 patent is disclosed by MITRE, as shown in the
8 chart set forth in Appendix 2.

9 Dr. Bartone's only attempt to counter the MITRE reference is a conclusory
10 attempt to dispute that the trunking beams are feeder beams. Dr. Bartone's entire
11 testimony on the subject is as follows:

12 Q: And in your expert opinion, does the [MITRE] reference disclose
13 or render obvious Claim 12 of the '875 patent?

14 A: No, it doesn't. In fact, even when Doctor Schindall was up here, he
15 basically said that this was before the internet, so this has no
 gateways. There's no interconnection of infrastructure connecting to
 the gateways.

16 He basically said that it's not enabled. This doesn't have feeder
17 beams. It doesn't have service beams. It just has beams. It doesn't have
18 gateways. It talks about different types of terminals, these CPS
 terminals and trunking terminals, but they're still all just terminals. So
 it comes up short on a lot of different paths.

19 Trial Tr. at 2696.

20 As set forth in SS/L's claim construction briefing, Doc. No. 153, the '875
21 patent does not require that a feeder beam connect with a terminal named a
22 "gateway" that connects to the Internet in particular. Instead, it merely requires that
23 a feeder beam be "a focusing of electromagnetic radiation to permit communication
24 between the satellite and one or more network interfacing terminals." *Id.* Even

1 under the Court's construction, however, it is clear that the "trunking band" beams
2 constitute "focusing[s] of electromagnetic radiation to permit communication
3 between the satellite and one or more gateways, where the information is received
4 from or relayed to one or more subscriber terminals located in the plurality of
5 service beam coverage areas." The fact that MITRE uses different nomenclature for
6 feeder beam by calling the terminal a "trunking terminal" rather than a "gateway" is
7 irrelevant. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) (holding anticipation "is
8 not an 'ipsissimis verbis' [in the same words] test"); *see also Teva Pharm. Indus.*
9 *Ltd. v. AstraZeneca Pharms. LP*, 661 F.3d 1378, 1384 (Fed. Cir. 2011) (holding the
10 prior art need not "us[e] the same words as the patentee would later use to claim it"
11 in order to anticipate). The '875 patent itself teaches that a ground terminal that
12 connects to the "Public Switched Telephone Network" is a "gateway," which is
13 "sometimes referred to as a hub or ground station." '875 Patent at 3:64-65, 4:6-28.
14 Dr. Bartone did not attempt to dispute Dr. Schindall's testimony that the "trunking
15 bands" indeed interfaced with the telephone network to connect subscribers to one
16 another. *E.g.*, Trial Tr. at 2248; *see also, e.g.*, Ex. F at Page 65 (noting CPS
17 terminals "give direct satellite access for local users," "trunking terminals . . .
18 support high volume multiplexed traffic," and "[c]ross traffic . . . between the two
19 services is also envisaged").

20 Furthermore, as Dr. Schindall explained, the half-circles in the MITRE beam
21 map labeled "CPS" denote service beams and their associated coverage areas, while
22 the half-circles labeled "trunking" beams denote feeder beams and their associated
23 coverage areas. *See* Appendix 2. Nothing in the '875 patent precludes service beams
24

1 and feeder beams from having completely overlapping coverage areas, as Dr.
2 Bartone seems to suggest. To the contrary, the Court rejected ViaSat's attempt at
3 *Markman* to import a limitation that proximate feeder and service beams must be
4 "separated by a distance." Doc. Nos. 154 & 206. That was the correct result, as
5 Figure 2B discloses a service beam entirely within the coverage area of the feeder
6 beam. '875 Patent at Fig. 2B (205-v and 225-2).

7 Thus, there is clear and convincing evidence that MITRE discloses every
8 limitation of claim 1 and there is no substantial evidence to the contrary.

9 b. AMC-17 Discloses Every Limitation of Claim 1.

10 SS/L made a "Firm Fixed Price" proposal to sell the AMC-17 satellite to
11 SES-Americom, Inc. on October 20, 2004. *See, e.g.*, Trial Tr. at 2244, 2251-52,
12 2475; *see also, e.g.*, Exs. G-I. AMC-17 is "on-sale bar" prior art under 35 U.S.C. §
13 102(b). "[T]he on-sale bar under 35 U.S.C. § 102(b) applies when (1) the invention
14 at issue had become the 'subject of a commercial offer for sale' more than one year
15 before the filing of the patent application; and (2) the invention was ready for
16 patenting, either by, for example, having that invention reduced to practice or by
17 preparing 'drawings or other descriptions of the invention' that would enable one
18 skilled in the art to practice the invention." *Special Devices, Inc. v. OEA, Inc.*, 270
19 F.3d 1353, 1354-55 (Fed. Cir. 2001) (quoting *Pfaff v. Wells Elecs., Inc.*, 525 U.S.
20 55, 67-68 (1998)).

21 AMC-17 is a commercial offer for sale more than one year before the filing
22 of the '038 Provisional in 2006. A Firm Fixed Price Proposal means that SS/L is
23 "ready to commit to building the satellite, if the customer accepts our terms"
24 Trial Tr. at 2475; *See generally* S-1446. *Honeywell Int'l Inc. v. Nikon Corp.*, 672 F.

1 Supp. 2d 638, 643-44 (D. Del. 2009) (concluding "Firm Fixed Price Proposal"
2 offered to Boeing constituted a commercial offer for sale). The offer was conveyed
3 by a detailed offer letter setting forth the contractual deliverables, the price, and the
4 schedule for delivery, along with a five-volume proposal that included an executive
5 summary, business proposal (with financial terms and Terms and Conditions),
6 management proposal, technical proposal, mark-up of RFP exhibits, compliance
7 matrices, and alternative options. *See, e.g.*, Exs. G-I. There is also no doubt that the
8 satellite was ready for patenting by preparing "drawings or other descriptions of the
9 invention that would enable one skilled in the art to practice the invention." *Pfaff*,
10 525 U.S. at 67-68. Indeed, the technical volume alone is exceedingly detailed,
11 replete with technical drawings and block diagrams, and spans over 600 pages. *See*
12 *generally* S-1446. Professor Schindall opined that AMC-17 is ready for patenting
13 and ViaSat did not dispute that point. Trial Tr. at 2278.

14 Clear and convincing evidence supports that AMC-17 discloses every
15 limitation of Claim 1. The testimony of Professor Schindall, along with Exs. G-I,
16 establish that each and every element of Claim 1 of the '875 patent is disclosed by
17 AMC-17, as shown in the chart set forth in Appendix 2. Dr. Bartone raised four
18 complaints about AMC-17, all of which are legally irrelevant and none of which
19 constitutes substantial evidence supporting the verdict.

20 First, Dr. Bartone noted that AMC-17 is not a partial CONUS satellite. *E.g.*,
21 Trial Tr. at 2693-94. But nothing in Claim 1 (or Claim 12 for that matter) requires
22 partial CONUS. A full CONUS design that places some feeder beams in the United
23 States proximate to service beams and also remote feeder beams in Canada or
24

1 Hawaii separate from all service beams would practice Claim 12 so long as the
2 coloring limitations were satisfied. Nothing in the claim language says that the spot
3 beams have to be located in the Continental United States at all, let alone in only
4 part of the Continental United States.

5 Second, Dr. Bartone complained that AMC-17 is a "12-gigabit-per-second
6 type of system" rather than "100 gigabits per second." Trial Tr. at 2694. But, once
7 again, nothing in Claim 1 or Claim 12 requires the practice of a 100 Gbps satellite.
8 Even assuming as true that AMC-17 could only achieve 12 Gbps does nothing to
9 refute the prima facie case that it satisfies each limitation of Claim 1.

10 Third, Dr. Bartone opined that Dr. Schindall failed to demonstrate that the
11 coloring limitations are satisfied according to Dr. Bartone's erroneous claim
12 constructions in which (1) the feeder beam must communicate with all of the
13 "plurality of service beams" and (2) the feeder beam must reuse color with each of
14 such non-proximate service beams (rather than a color from the "set of colors"
15 allocated to non-proximate service beams).⁵ See Trial Tr. at 2694-95. More

16
17 ⁵ Dr. Bartone tried to argue that its insertion of this additional limitation into the
18 construction of "service beam" is justified based on the Court's construction of a
19 completely separate term, "feeder beam." Ex. P. In other words, because a "feeder
20 beam" must (according to the Court's construction) relay information to or receive
21 information from "subscriber terminals located in one of the plurality of service
22 beam coverage areas," ViaSat advocates that the only service beams in the
23 "plurality of service beams" are those that relay information to or receive
24 information from "the at least one feeder beam." *Id.* On its own terms, this
argument is simply illogical. The Court's construction of "feeder beam" required
only that "the at least one feeder beam" communicate with subscriber terminals in
"one of the plurality of service beam coverage areas." That necessarily implies that
there could be other service beams in the "plurality of service beams" that do not
communicate with "the at least one feeder beam." And yet by inserting the

1 specifically, Dr. Bartone did not dispute Dr. Schindall's testimony that feeder beam
2 7 communicates with service beam 67 and reuses a color from the "set of colors"
3 allocated to each of the non-proximate service beams. That is all that is required to
4 satisfy the Court's claim constructions. For the reasons set forth in SS/L's *Daubert*
5 briefing, Dr. Bartone's insertion of additional limitations into the claim is improper
6 and cannot serve as a basis for distinguishing AMC-17. Doc. No. 526; *see also*
7 *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1321 (Fed. Cir. 2009).

8 Fourth, Dr. Bartone testified that in AMC-17, "gateways are within the
9 beams, but the disclosure doesn't even identify which beams the gateways are going
10 through." Trial Tr. at 2695. It is not even clear what Dr. Bartone meant by this, but
11 SS/L presumes that he means the gateway terminals are inside of the same beams
12 that include subscriber terminals. This is belied by the face of the AMC-17
13 reference. The AMC-17 satellite, in fact, has five separate antennas—four of which
14 produce the "service beams" and one of which is a "[l]arge dedicated hub antenna"
15 that produces all of the hub or "feeder beams." Trial Tr. at 2260; Ex. I at
16 SSL0101969. Thus, every spot beam produced by the satellite is either a "service
17 beam" produced by one of the four "service beam" antennas, or else a "dedicated
18 hub" beam produced by the separate hub antenna. There is no antenna that produces
19 a single spot beam that communicates with both feeder and service beams.

20 _____
21 (... cont'd)

22 requirement that the "plurality of service beams" must each communicate with "the
23 at least one feeder beam," Dr. Bartone effectively opined that the feeder beam must
24 communicate with all service beams rather than with one of them.

1 Finally, Dr. Bartone baldly asserted that AMC-17 "doesn't teach frequency
2 reuse." Trial Tr. at 2696. This conclusion is, frankly, baffling—it is flatly belied by
3 the explicit text in the Executive Summary and the frequency plan in the Technical
4 Volume, among numerous other disclosures. *See, e.g.*, Ex. I at Page 7 of 25.

5 Thus, AMC-17 discloses every limitation of Claim 1 and no reasonable jury
6 could disagree. To the extent that AMC-17 or MITRE are missing the additional
7 limitation of Claim 12—a remote feeder beam that uses all of the colors of the
8 beam pattern—one of ordinary skill in the art would be motivated to combine them
9 with references disclosing this additional feature.

10 c. Sharon discloses the Additional Claim 12 Limitations.

11 The Sharon patent is a United States patent filed on May 23, 2000 and issued
12 on March 9, 2004. *See* S-1845. Thus, the Sharon Patent is a printed publication
13 under 35 U.S.C. §§ 102(a) and 102(b). Ex. J. The testimony of Professor Schindall,
14 along with Exhibit S-1845, demonstrates that the Sharon Patent discloses a "remote
15 hub" that is "located in a remote portion of the CONUS" and that uses all of the
16 colors of the beam pattern, as set forth in Appendix 2.

17 Once again, Dr. Bartone's cursory attempts to dispute that Sharon supplies
18 the missing limitations of Claim 12 failed to raise substantial evidence to the
19 contrary. First, Dr. Bartone argued that Sharon was before the examiner. Trial Tr. at
20 2690. That is true as far as it goes, but neither AMC-17 nor MITRE was before the
21 examiner. Thus, Sharon was not before the examiner in either of the obviousness
22 combinations advanced here. Second, Dr. Bartone opined that Sharon "teaches
23 away" because it supposedly discloses that "the hub or gateway is within every
24 beam" and that this is a "fundamental notation of high-capacity local broadcast data

1 services." Trial Tr. at 2691. But Dr. Bartone's gloss is belied by the plain text of the
2 patent. Sharon merely teaches that the current invention "can provide a hub in every
3 spot beam." Ex. J at 6:24-28 (emphasis added). But it also discloses embodiments
4 where a spot beam contains only hubs, *see id.* at Fig. 10, and embodiments where a
5 spot beam contains only subscriber terminals, *see id.* at Fig. 17 & 4:9-25. Under
6 Federal Circuit case law, "[t]he prior art's mere disclosure of more than one
7 alternative does not constitute a teaching away . . . because such disclosure does not
8 criticize, discredit, or otherwise discourage the solution claimed in the [asserted
9 patent]." *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Third, while Dr.
10 Bartone attempted to raise the above two purported secondary indicia, he did
11 absolutely nothing to contradict Dr. Schindall's analysis that Sharon discloses the
12 additional limitations of Claim 12 that a remote feeder beam is allocated all of the
13 colors of the beam pattern. Nor did Dr. Bartone contradict that one of ordinary skill
14 in the art would be motivated to combine Sharon—which teaches a high-capacity
15 system achieving over 150 Gbps—with MITRE or AMC-17.

16 SS/L thus presented a prima facie case of obviousness with clear and
17 convincing evidence, based on combining MITRE or AMC-17 with Sharon.

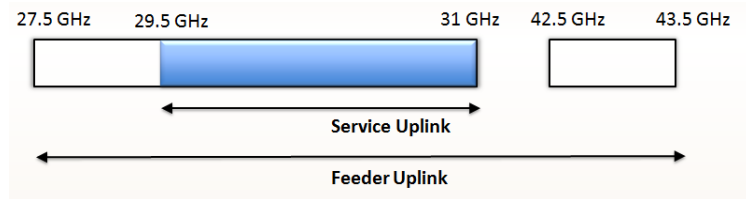
18 d. Asato and the ITU Regulations It Incorporates by
19 Reference Disclose the Additional Claim 12 Limitations.

20 In addition to combining MITRE or AMC-17 with Sharon, one of ordinary
21 skill in the art would further be motivated to combine them with the Asato paper
22 and the ITU Regulations it incorporates by reference. *See generally* Exs. K-L. Both
23 the Asato paper, published in 1995, and the ITU Regulations, published in 1994,
24 are printed publication prior art under 35 U.S.C. §§ 102(a) and 102(b).

1 As Professor Schindall explained, the Asato paper discloses a military
2 satellite that will provide "service beams" with "service beam coverage areas" in the
3 theater of operations in the Middle East (referred to as "theater beams") and a
4 single, remote "feeder beam" with a "feeder beam coverage area" in the United
5 States. Trial Tr. at 2272. S-1180 at Figs. 2, 4, 6. Dr. Bartone did not dispute that
6 Asato satisfied these limitations. Moreover, Asato expressly or, at the very least,
7 inherently discloses that the remote feeder beam reuses all of the colors of the beam
8 pattern. Trial Tr. at 2273-75.

9 Asato expressly discloses that the remote feeder beam is allocated the 27.5
10 GHz to 31.0 GHz bands in two polarizations for "feeder link bandwidth" on the
11 "forward path." *E.g.*, Trial Tr. at 2274-75; S-1180 at Page 726. Asato further
12 discloses that the service beams in the middle east are allocated 1.5 GHz of
13 bandwidth for 30 GHz MSS on the uplink and that "[f]or [ITU] regions 1 through 3,
14 1.5 GHz has been allocated for mobile satellite service (MSS) at 30/20-GHz." *E.g.*,
15 Ex. K at Figs. 4,6 & Page 724. The ITU Regulations, in turn, show that there is in
16 fact 1.5 GHz of MSS bandwidth on the uplink from 29.5-31 GHz in Regions 1 and
17 3. *E.g.*, Trial Tr. at 2274-75; Ex. L at 3.⁶ Thus, as depicted below, Asato expressly
18 discloses that the remote feeder beam is using all of the colors of the beam pattern,
19 of which the service beam colors are a subset:

20
21 ⁶ SS/L submits that Asato incorporates the ITU Regulations by reference and, thus,
22 they should be treated as a single prior art reference inherently teaching this
23 concept. In the alternative, however, one of ordinary skill in the art would be
24 motivated to combine Asato with the ITU Regulations to discern the precise
frequency reuse scheme set forth in Asato.



Once again, Dr. Bartone failed to offer substantial evidence to the contrary. Dr. Bartone did nothing to dispute Dr. Schindall's analysis of the express and inherent disclosures in the Asato paper (and the ITU Radio Regulations). Instead, he simply offered the cursory opinion—belied by the face of these references—that "Dr. Schindall has not demonstrated and this reference does not teach how that bandwidth is distributed and whether it may or may not overlap and whether or not it may or may not use all of the colors of the beam pattern." Trial Tr. at 2692.

Dr. Bartone's only other criticism of Asato is that it is a military paper meant to "optimize . . . conflicts in a particular regional setting like the Middle East." Trial Tr. at 2692. Perhaps Dr. Bartone meant to imply that one of ordinary skill in the art would not be motivated to combine a military paper like Asato with a commercial satellite like AMC-17. But Dr. Bartone agreed on cross-examination that he did not mean to suggest that "military art is [not] widely enough known to be appreciated in the civilian world." Trial Tr. at 2701. Moreover, the paper itself indicates a motivation to combine military and commercial applications, stating that because there is "adjacent proximity of the commercial and military bands, there is an opportunity for the military sector to leverage off the commercial sector's consumer-market economy of scale." Ex. K at Page 730 (emphasis added). To that end, the paper teaches that certain satellite components "could cover both the commercial and military 30-/20-GHz bands" and "the operating range of the 30-

1 /20-GHz commercial satellites could be extended to include the military bands." *Id.*
2 at Page 731 (emphasis added). In other words, the paper itself discloses a
3 motivation to combine commercial and military satellite art.

4 Clear and convincing evidence therefore demonstrates a prima facie case of
5 obviousness based on the combination of either MITRE or AMC-17 with Asato
6 (and, if necessary, the incorporated ITU Radio Regulations).

7 **2. Secondary Factors Cannot Defeat Obviousness.**

8 This is a classic case of obviousness under *KSR*. As the above discussion
9 demonstrates—and as Dr. Schindall testified—Claim 12 of the '875 patent is
10 nothing more than a combination of familiar elements, using known methods, to
11 yield entirely predictable results. Adding a remote feeder beam reusing all of the
12 colors of the beam pattern (as disclosed in Sharon and Asato) to either MITRE or
13 AMC-17 achieves the entirely predictable result of (1) allowing a feeder beam that
14 is unconstrained by interference from any neighboring service beams to make
15 maximum use of scarce frequency resources and (2) increasing capacity with the
16 number of additional colors that feeder beam is permitted to use by virtue of its
17 spatial diversity. *See, e.g.*, Trial Tr. at 2214-19. None of ViaSat's witnesses offered
18 any explanation why this combination would yield unpredictable results or why
19 there would be any technical impediment to spatially separating one or more feeder
20 beams and allowing that feeder beam to use all of the available colors.

21 ViaSat offered evidence that ViaSat-1 is commercially successful and has
22 been entered in the Guinness Book. *E.g.*, Trial Tr. at 1794-96, 2686-88. But there is
23 no evidence that the commercial success of ViaSat-1—or any praised it received for
24 having high capacity—bears any nexus to the fact that it practices Claim 12 of the

1 '875 patent. To the contrary, Dr. Bartone admitted that a satellite with completely
2 isolated feeder beams would not practice Claim 12 and yet would achieve even
3 higher capacity. Trial Tr. at 2688; 2699-70.

4 ViaSat purported to rely on Mr. Burr's patent as having been copied from the
5 '038 Provisional. Trial Tr. at 2689. Before trial, ViaSat indicated that it intended to
6 rely on the "Option 3" email to show "deliberate copying" by Mr. Burr. Doc. No.
7 818. But, as set forth in SS/L's co-pending motions, "Option 3" cannot serve as the
8 basis for copying Claim 12 because (1) it lacks the proximate feeder and service
9 beams required by Claim 1 and (2) therefore it is not even a conception document
10 for the patent, as Mr. Dankberg admitted. Trial Tr. at 227. *Amazon.com, Inc. v.*
11 *Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1366 (Fed. Cir. 2001) ("[E]vidence of
12 copying Amazon's '1-Click®' feature is legally irrelevant unless the '1-
13 Click®'feature is shown to be an embodiment of the claims.").

14 As a result, Dr. Bartone abandoned "Option 3" as the basis for copying
15 altogether, instead opining that the Burr patent was a deliberate copy of the '038
16 Provisional. Trial Tr. at 2689. But there is literally zero evidence that Mr. Burr ever
17 saw the '038 Provisional. Instead, Dr. Bartone himself admitted there is no evidence
18 that anyone at SS/L had seen the '038 Provisional until the Jupiter design was "well
19 underway." Trial Tr. at 1588. Multiple witnesses testified that ViaSat never
20 informed SS/L of its pending patent applications in 2006 or 2007. *E.g.*, Trial Tr. at
21 447, 619-10, 665, 2476. The only evidence in the record that anyone at SS/L
22 learned of the '038 Provisional is an August 2009 letter ViaSat's President, Mr.

1 Baldridge, sent to SS/L's President, Mr. Celli, that attached the '038 Provisional —
2 over two years after Mr. Burr filed his patent. *E.g.*, Trial Tr. at 326-29, 335-36.

3 As a matter of law, there is no evidence of "deliberate copying." The Federal
4 Circuit has made clear that "[c]opying requires the replication of a specific
5 product," which may be shown through evidence indicating the infringer had access
6 to the thing being copied. *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317,
7 1325 (Fed. Cir. 2004) (holding copying could be shown through "disassembling a
8 patented prototype, photographing its features, and using the photograph as a
9 blueprint to build a virtually identical replica"). Even if Mr. Burr filed a patent
10 around the same time as ViaSat on a similar feature, that would, at most, show
11 contemporaneous, independent invention—a secondary indicia of obviousness. *See*,
12 *e.g.*, *In re Merck & Co., Inc.*, 800 F.2d 1091, 1098 (Fed. Cir. 1986).

13 Finally, Dr. Bartone testified that he considered there to be a failure by others
14 to achieve a 100 Gbps satellite because several witnesses testified that they had
15 never seen a satellite built before ViaSat-1 with 100 Gbps of capacity and a
16 combination of partial CONUS and isolated gateways reusing all of the spectrum.
17 Trial Tr. at 2689-90. Once again, this is legally insufficient for several reasons.

18 First, a 100 Gbps satellite is not a limitation of Claim 12. Second, rather than
19 requiring only isolated gateways, Claim 12 requires that there be at least one feeder
20 beam that is proximate to a service beam. Third, Dr. Bartone admitted that not only
21 would a satellite with fully separated feeder beams not practice Claim 12, but it
22 would achieve higher capacity. Finally, there is no evidence that SS/L (or anyone
23 else) ever tried and failed to design or build a satellite with the actual limitations of
24

1 Claim 12. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*,
 2 464 F.3d 1356, 1371-72 (Fed. Cir. 2006) (reversing denial of JMOL for
 3 obviousness and finding no "failure by others" where the alleged failed attempt was
 4 halted due to cost reasons and not technical difficulties). Here, as in *Dystar*, the
 5 only evidence is that SS/L designs bespoke satellites based on customer demand
 6 and it had simply never had a customer before ViaSat that asked for the features of
 7 Claim 12. *E.g.*, Trial Tr. at 399-400, 2454-55. There is no evidence that the absence
 8 of a satellite practicing Claim 12 before ViaSat was due to any technical difficulty
 9 that the '875 patent somehow resolved.

10 This is not a case of a long-felt and unmet need in the market waiting for an
 11 amazing technological breakthrough to come along. Instead, this is a case of an
 12 obvious combination of technologies waiting for the right business opportunity. As
 13 a result, SS/L is entitled to judgment as a matter of law that Claim 12 is obvious.

14 **C. Alternatively, SS/L is Entitled to a New Trial.**

15 **1. Erroneous Claim Constructions Prejudiced SS/L.**

16 In the alternative, SS/L is entitled to a new trial because of the Court's
 17 erroneous claim constructions. "An erroneous instruction on claim interpretation
 18 that affects the jury's decision on [invalidity] is grounds for a new trial." *Seachange*
 19 *Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1381 (Fed. Cir. 2005). For the reasons set
 20 more fully in SS/L's pre-trial briefing on various claim construction issues, the
 21 claim constructions for "service beam" and "feeder beam" were erroneous. In
 22 addition, for the reasons set forth above and in SS/L's pretrial briefing, it was error
 23 for the Court to refuse to construe the "set of colors" limitation and to permit Dr.
 24 Bartone to offer opinions that contradicted the Court's construction of "service

1 beam." These errors had prejudicial effect, as SS/L presented evidence that would
2 support an obviousness finding under the appropriate constructions and because Dr.
3 Bartone's only distinctions over the prior art were based on erroneous constructions.

4 **2. The Verdict is Against the Weight of the Evidence.**

5 In the alternative, SS/L is entitled to a new trial because the verdict is against
6 the weight of the evidence. "[T]he trial court may grant a new trial, even though the
7 verdict is supported by substantial evidence, if 'the verdict is contrary to the clear
8 weight of the evidence or is based upon evidence which is false, or to prevent, in
9 the sound discretion of the trial court, a miscarriage of justice.'" *Wordtech Sys. v.*
10 *Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1313 (Fed.Cir.2010). For the
11 reasons set forth above, SS/L is at least entitled to a new trial as to the '827 and '875
12 patents' validity, since the verdict is against the clear weight of the evidence.

13 **IV. CONCLUSION**

14 For the reasons set forth above, SS/L is entitled to entry of judgment as a
15 matter of law that Claim 7 of the '827 patent is invalid as anticipated and obvious in
16 light of the prior art. SS/L is further entitled to entry of judgment as a matter of law
17 that Claim 12 of the '875 patent is invalid as obvious. In the alternative, SS/L is
18 entitled to a new trial on invalidity of both patents.

19
20 Dated: June 13, 2014

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CERTIFICATE OF SERVICE

I hereby certify that, on June 13, 2014, I caused the foregoing **DEFENDANTS' MOTION FOR JUDGMENT AS A MATTER OF LAW (RENEWED), OR A NEW TRIAL (10 OF 12), REGARDING THE INVALIDITY OF THE ASSERTED CLAIMS OF THE '827 AND '875 PATENTS IN LIGHT OF THE PRIOR ART**, along with Appendices 1 and 2, to be served on opposing counsel via the Court's CM/ECF system.

Dated: June 13, 2014

By: /s/ Amanda K. Bonn

APPENDIX 1

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Anticipatory: AtContact (2004)
[a] A geostationary orbit (GSO), satellite comprising:	<u>See, e.g., Trial Tr. at 2284 (Dr. Schindall Testimony):</u> Q. Professor Schindall, in your opinion, does the AtContact filing anticipate claim elements 7(a) and 7(b) of the '827 patent? A. Yes, it does. Q. [A]nd can you explain to the jury what evidence you found to support that? A. Sure. In the text of their filing it says it's fo[u]r GSO satellites, but they will also host the payloads of fo[u]r NGSO satellites, meaning that it's a combination of the GSO and an NGSO payload that comprise the [geosynchronous] orbit . . . satellites, meaning it's in a geo synchronous orbit and each satellite will have 30 active receive beams and 24 transmit beams, and they actually - - I've actually shown the chart that shows it's using the NGSO spectrum on the left and the GSO spectrum on the right." <u>See also, e.g., S-1160 at SSL0083571:</u> ("Four GSO satellites will be located at 83W, 121W, 34E, and 130E. These satellites will also host the payloads of the four non-GSO satellites that comprise the geosynchronous circular-orbit plane of satellites.").
[b] a receiver configured to receive from one or more ground stations signals in a GSO frequency band and in an extended frequency spectrum, the extended frequency band spectrum including the GSO frequency band and a non-geostationary orbit (NGSO) frequency band;	<u>See, e.g., Trial Tr. at 2284 (Dr. Schindall Testimony):</u> Q. Professor Schindall, in your opinion, does the AtContact filing anticipate claim elements 7(a) and 7(b) of the '827 patent? A. Yes, it does. Q. [A]nd can you explain to the jury what evidence you found to support that? A. Sure. In the text of their filing it says it's fo[u]r GSO satellites, but they will also host the payloads of fo[u]r NGSO satellites, meaning that it's a combination of the GSO and an NGSO payload that comprise the [geosynchronous] orbit . . . satellites, meaning it's in a geo synchronous orbit and each satellite will have 30 active receive beams and 24 transmit beams, and they actually - - I've actually shown the chart that shows it's using the NGSO spectrum on the left and the GSO spectrum on the right." <u>See also, e.g., S-1160 at SSL0083571:</u> ("Each satellite will have <u>30 active receive beams</u> and 24 active transmit beams. Each beam will be able to operate on RHCP and/or LHCP. Each transmit and receive beam will be able to be assigned to any point in the satellite field of view. Each non-GSO satellite has an Earth coverage antenna beam for order wire. The purpose of the order wire is to support the communications between the ground terminals and the satellites or/and Network Control Center.") (emphasis added).

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7

Anticipatory: AtContact (2004)

See also, e.g., S-1160 at SSL0083537 (Table 1):

Table 1: @contact Orbital and Frequency Configuration

@contact ORBITAL AND FREQUENCY PLAN		UPLINK	DOWNLINK
Non-GSO Component	3 HEO Satellites	28.6-29.1 GHz (Primary) 29.5-30 GHz (Secondary/Non-Unacceptable Interference Basis)	18.8-19.3 GHz (Primary) 19.7-20.2 GHz (Secondary/Non-Unacceptable Interference Basis)
	4 Geosynchronous Circular-Orbit Satellites at 83°W, 121°W, 34°E, and 130°E	28.6-29.1 GHz (Secondary, and used to resolve MX situations during non-GSO in-line events)	18.8-19.3 GHz (Secondary, and used to resolve MX situations during non-GSO in-line events)
GSO Component	GSO 1: 83° W	28.35-28.6 GHz (Primary) 29.25-30 GHz (Primary)	18.3-18.8 GHz (Primary) 19.7-20.2 GHz (Primary)
	GSO 2: 121° W	28.35-28.6 GHz (Primary) 29.25-29.5 GHz (Primary)	18.3-18.8 GHz (Primary) 19.7-20.2 GHz (Primary)
	GSO 3: 34° E	28.35-28.6 GHz (Primary) 29.25-30 GHz (Primary)	18.3-18.8 GHz (Primary) 19.7-20.2 GHz (Primary)
	GSO 4: 130° E	28.35-28.6 GHz (Primary) 29.25-30 GHz (Primary)	18.3-18.8 GHz (Primary) 19.7-20.2 GHz (Primary)

See also, e.g., S-1160 at SSL0083537 (Tables 4B & 4C):

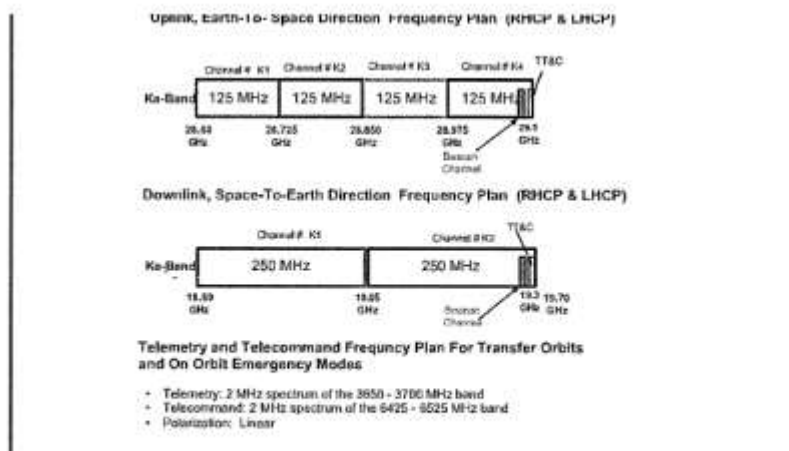
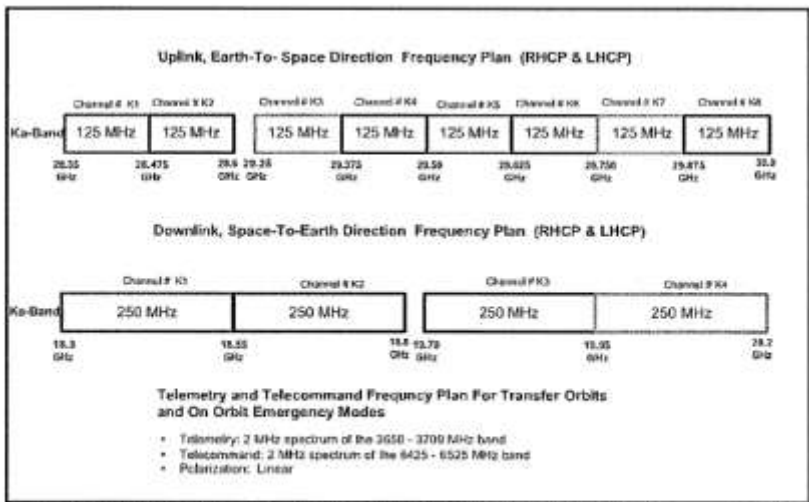


Figure 4B: Non-GSO Satellite (Geosynchronous Circular-Orbit) – Frequency and Polarization Plan

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Anticipatory: AtContact (2004)
	 Uplink, Earth-To-Space Direction Frequency Plan (RHCP & LHCP) Channel # K1 Channel # K2 Channel # K3 Channel # K4 Channel # K5 Channel # K6 Channel # K7 Channel # K8 Ka-Band 125 MHz 125 MHz 125 MHz 125 MHz 125 MHz 125 MHz 125 MHz 125 MHz 28.55 GHz 28.475 GHz 28.5 GHz 28.525 GHz 28.55 GHz 28.575 GHz 28.6 GHz 28.625 GHz Downlink, Space-To-Earth Direction Frequency Plan (RHCP & LHCP) Channel # K1 Channel # K2 Channel # K3 Channel # K4 Ka-Band 250 MHz 250 MHz 250 MHz 250 MHz 18.3 GHz 18.55 GHz 18.8 GHz 18.95 GHz Telemetry and Telecommand Frequency Plan For Transfer Orbits and On Orbit Emergency Modes • Telemetry: 2 MHz spectrum of the 3650 - 3700 MHz band • Telecommand: 2 MHz spectrum of the 6425 - 6525 MHz band • Polarization: Linear Figure 4C: GSO Satellites Located at 83W, 121W, 34E and 130E – Frequency and Polarization Plan
[c] circuitry configured to establish an activated frequency mode to activate one of a GSO frequency band mode and an extended frequency spectrum mode based on information indicating a presence or an absence of an interference situation with an NGSO satellite system; and	<u>See, e.g., Trial Tr. at 2284-86 (Dr. Schindall Testimony):</u> Q. Let's talk about 7(c). Does AtContact satisfy 7(c), the circuitry limitation? A. Yes, it does. Q. And where do you see that, sir? A. I see that in the description of the AtContact diagram where they – where they talk about having the capability of requiring any or all of the AtContact satellites and the Earth stations to cease their transmissions in the NGSO band to avoid causing such interference. Q. How can you tell that it's in the NGSO band? A. Because the frequency is called out. I didn't say anything, but the 18.8 to 19.3 and the 28.6 to 29.1 are the NGSO frequencies. They do not mention anything about turning off the geosynchronous frequencies, and why should they? They have the primary access to those frequencies. Q. And during what periods of time would they turn off the NGSO frequency bands? A. Again, at the end of that statement, it explains that they would turn that off during the non – during the inline interference events when they would cause an interfering situation.

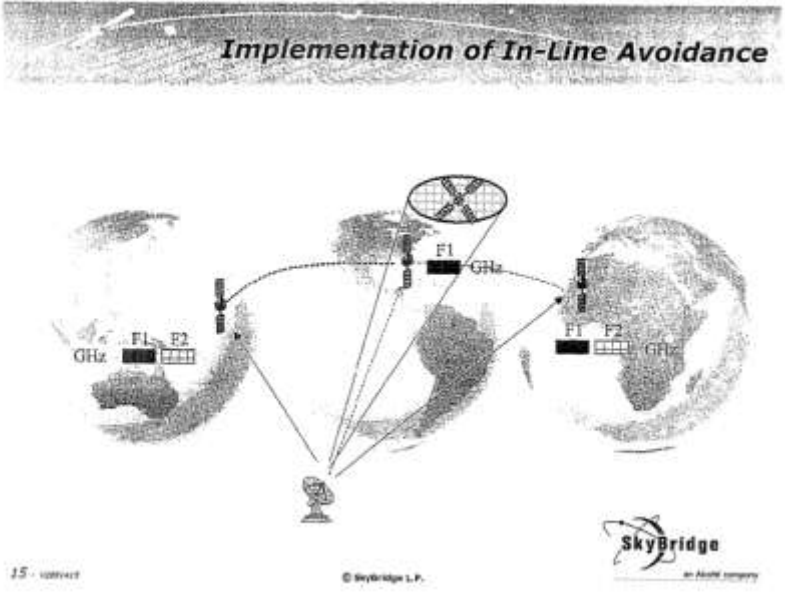
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Anticipatory: AtContact (2004)
	<u>See also, e.g., S-1159 at SSL0083519:</u> (“In the case of a non-GSO FSS system that has the potential to receive harmful or unacceptable interference from a @contact ‘GSO’ satellite or associated earth station, @contact is prepared to and has the capability of requiring any or all of the @contact satellites . . . and their associated earth stations to cease their transmissions in the 18.8-19.3 GHz and 28.6-29.1 GHz [NGSO] bands to avoid causing such interference. In addition, these four @contact satellites will not demand any protection or reduction in spectrum from other non-GSO satellite systems during the ‘in-line’ interference events with the non-@contact non-GSO satellites.”). <u>See also, e.g., S-1159 at SSL0083494-95:</u> (“In making its proposal to operate a plane of geosynchronous-orbit ‘non-GSO’ satellites in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, @contact recognized that the treatment of such satellites as non-GSO spacecraft . . . is a question of first impression before the Commission. . . . To account for this uncertainty, and the resultant prospect that @contact’s geosynchronous-orbit satellites could be considered by the Commission to be traditional GSO satellites seeking to use a primary non-GSO band, @contact included in its March 22 Amendment a contingent request for waiver . . . to enable it to operate four GSO satellites in the non-GSO FSS-primary segments of Ka-band The principal difference between an @contact geosynchronous-orbit satellite and an @contact ‘GSO’ satellite in the 18.8-19.3 GHz and 28.6-29.1 GHz [NGSO] band lies in what happens during ‘in-line’ interference events with other systems’ non-GSO satellites. In the former case . . . the rules specify that the @contact non-GSO and non-@contact non-GSO satellites would each be limited to one-half of the available spectrum for the duration of the event. In the latter case, if they are treated as secondary ‘GSO’ satellites for purposes of the Commission’s regulations, the @contact geosynchronous-orbit satellites would lose access to the full 2 x 500 MHz of [NGSO] spectrum in question for the duration of the event.”).
[d] a transmitter configured to transmit in one of the GSO frequency band and in the NGSO frequency spectrum based on the activated frequency spectrum mode.	See above (“Q. And does that also satisfy claim element 7[d]? A. Yes, it does.”). Trial Tr. at 2286.

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)
[a] A geostationary orbit (GSO), satellite comprising:	<u>Combination:</u> <i>See, e.g.,</i> Trial Tr. at 2288-89 (Dr. Schindall Testimony): Q. And, Professor, I see you've put together a slide showing a combination of certain prior art. Can you explain your opinion on this to the jury? A. Yes, I can. Essentially what I'm saying is that the prior art renders the '827 patent obvious. I went back to the FCC third report and order which required secondary operators to submit a technical demonstration. I showed you the AtContact 2004 report where they did exactly that and got FCC approval, and then I also showed you the Weideman published application in 2001 which actually showed a means of implementing that. Q. Okay, sir. Was this prior art that we just talked about before the Patent Office? A. No. Actually this prior art was not before the Patent Office. Q. Okay. And would one of ordinary skill in the art be motivated to combine these three references together to render the '827 patent obvious? A. Yes, they would. Q. And why is that, sir? A. Well, all of them have to do with ways of getting the maximum spectrum that you can when you're working with a geosynchronous multi-beam satellite. <u>FCC Rules Evidence:</u> <i>See, e.g.,</i> Trial Tr. at 2279 (Dr. Schindall Testimony): Q. We're shifting gears a little bit and talking about the '827 patent. And before we sort of get into the prior art, could you give the jury just a high-level overview of your opinions regarding this patent? A. I don't know how it was issued. This – the FCC in 1997 issued a third report and order that I will tell you about that basically said that GSO satellites could use – I'll be going through that. So I shouldn't get ahead of myself. My opinion is that it was well predicted by the FCC third report and order and by other actual systems that were proposed prior – well prior to the issuing of the patent. <i>See, e.g.,</i> S-1210 at SSL1531106 (“With this <i>Report and Order</i>, we adopt licensing qualification requirements and service rules for a new generation of fixed-satellite service (‘FSS’) systems in the Ka-band.”) <i>See also, e.g.,</i> S-1210 at SSL1531120 (“In the following text, we briefly discuss implementation of the 28 GHz GSO FSS and NGSO FSS non-Government systems in specific band segments.”)

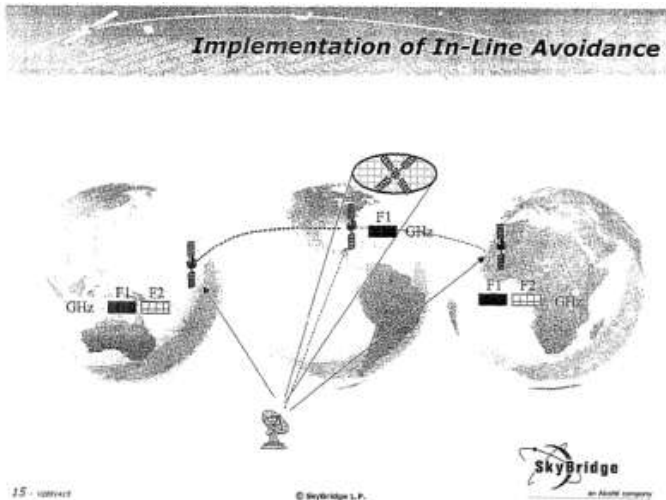
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)
	<i>See also, e.g.,</i> S-1210 at SSL1531120 (“Under the band plan, GSO FSS systems may operate . . .”). <u>SkyBridge Filing Evidence:</u> <i>See, e.g.,</i> S-1170 at SSL0084653:  <u>Weideman Patent Evidence:</u> <i>See, e.g.,</i> Trial Tr. at 2288: Q. [S]ir, have you also considered the Weideman patent as bearing on claim seven of the '827 patent? A. I have. Actually, Bob Weideman was the VP of engineering at Global Star. So I knew him during the years that I worked there, and he applied for a patent based on Global Star where you could use a switch and a series of different filters in order to dynamically adjust the bandwidth of the system.” MS. BONN: And that’s S-1171 at the title, Figure 2(a) and Figure 7. <i>See, e.g.,</i> S-2271 at ¶ 3 (“The satellites for these communication services generally operate in Low Earth Orbit (LEO) or in Medium Earth Orbit (MEO), and occasionally in Geo-synchronous Orbit (GEO).”).

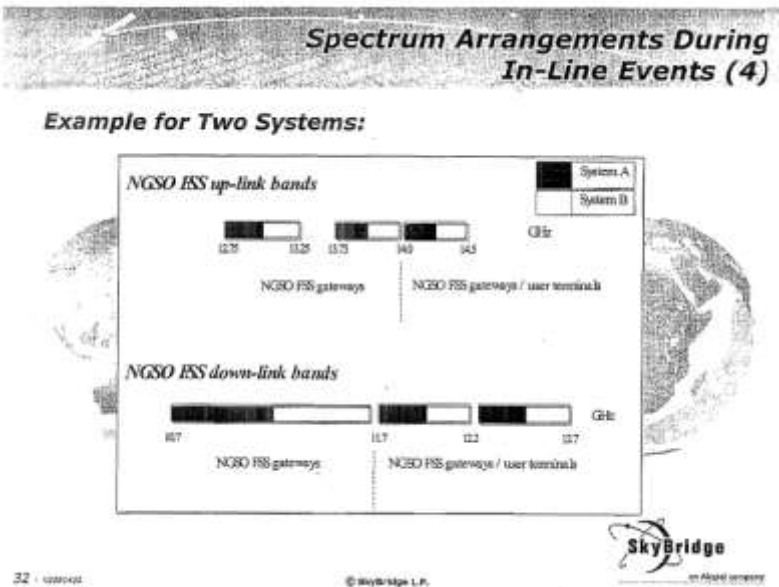
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)																			
[b] a receiver configured to receive from one or more ground stations signals in a GSO frequency band and in an extended frequency spectrum, the extended frequency band spectrum including the GSO frequency band and a non-geostationary orbit (NGSO) frequency band;	FCC Rules Evidence: See, e.g., Trial Tr. at 2280-81 (Dr. Schindall Testimony): Q. You've mentioned this FCC third report and order. Why don't you go ahead and tell the jury what is the FCC third report and order? A. I was actually – had some association with the FCC's – the study of this area. The FCC, Federal Communication Commission, they define the rules of the road, what frequencies can you use, what frequencies can you not use. And after study with industry, they proposed the green areas or the GSO frequencies as being primary for GSO satellites. They didn't stop there. They also described the NGSO frequencies, which are in kind of a blue color, as being secondary for GSO satellites. They didn't have to do that, but they chose to include that in their third report and order and they actually did the other way around, to be fair. The GSO frequencies are secondary for NGSO satellites. * * * Q. [A]nd I see you've put together another little excerpt from the third report and order. Can you explain to the jury why you did that? A. Sure. I wanted to explain how clearly the FCC described their intention. They said to ensure non-interfering operations will require all secondary operators -- a secondary operator would be, for example, a GSO operator who is using an NGSO spectrum because they're using it on a secondary basis – to submit to the Commission the technical demonstration – that just means some kind of a paper that demonstrates this – that it can operate on a non-harmful interference basis to the type of satellite and system that has licensing priority which would be the primary holder of that spectrum. See also, e.g., S-1210 at SSL1531121 Table: 1. Uplink Frequency Bands <table><tr><td>LMDS fss</td><td>GSO FSS ngso fss</td><td>NGSO FSS gso fss</td><td>MSS FEEDER LINKS & LMDS (h-s)</td><td>MSS FEEDER LINKS & GSO/FSS</td><td>GSO FSS ngso fss</td></tr><tr><td>850 MHz</td><td>250 MHz</td><td>500 MHz</td><td>150 MHz</td><td>250 MHz</td><td>500 MHz</td></tr><tr><td>27.5</td><td>28.35</td><td>28.60</td><td>29.1</td><td>29.25</td><td>29.5</td><td>30.0 GHz</td></tr></table> See also, e.g., S-1210 at SSL1531121: ("Under the plan, GSO FSS systems may operate in the following bands: 27.50-28.35 GHz; 28.35-28.60 GHz; 28.60-29.10 GHz; 29.25-29.50 GHz, and 29.50-30.0 GHz. Their status in these bands varies, however. First, GSO FSS	LMDS fss	GSO FSS ngso fss	NGSO FSS gso fss	MSS FEEDER LINKS & LMDS (h-s)	MSS FEEDER LINKS & GSO/FSS	GSO FSS ngso fss	850 MHz	250 MHz	500 MHz	150 MHz	250 MHz	500 MHz	27.5	28.35	28.60	29.1	29.25	29.5	30.0 GHz
LMDS fss	GSO FSS ngso fss	NGSO FSS gso fss	MSS FEEDER LINKS & LMDS (h-s)	MSS FEEDER LINKS & GSO/FSS	GSO FSS ngso fss															
850 MHz	250 MHz	500 MHz	150 MHz	250 MHz	500 MHz															
27.5	28.35	28.60	29.1	29.25	29.5	30.0 GHz														

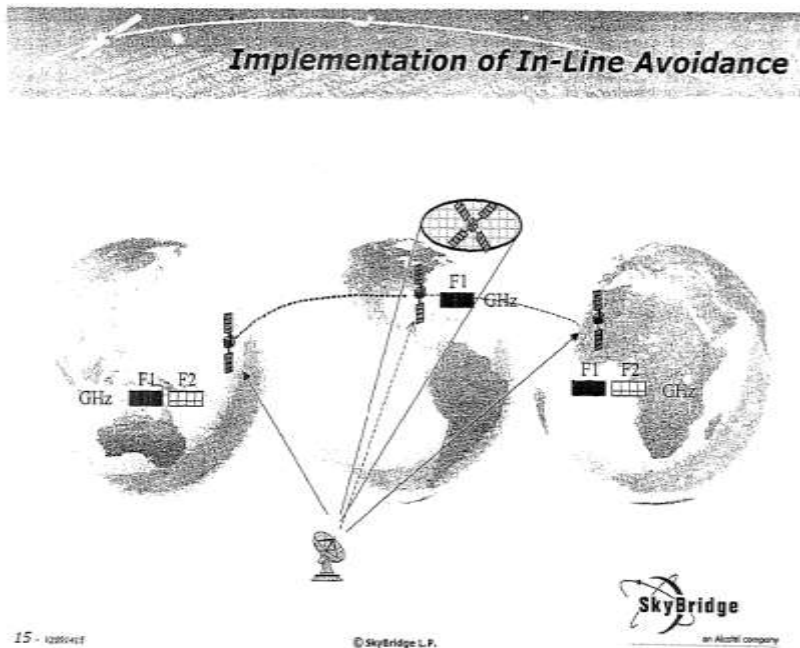
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)
	systems are designated exclusive primary spectrum in the 28.35-28.60 and 29.50-30.0 GHz band segments. . . . Specifically, in these bands, no other service can cause interference to GSO FSS transmissions GSO FSS systems are also designated on a secondary priority basis to NGSO FSS systems in the 28.60 to 29.10 GHz band segment. As a secondary user in these band segments, GSO FSS operators shall not cause harmful interference to stations of a primary service”). <u>SkyBridge Filing Evidence:</u> See, e.g., Trial Tr. at 2281-82 (Dr. Schindall Testimony): Q. [C]an you explain to the jury what is the Skybridge filing? A. Skybridge is a company that proposed an NGSO system in 2002, and they needed to demonstrate to the FCC that they could avoid interference with other NGSO systems, and so they proposed an arrangement where they would split the spectrum in half, F1 and F2 in the diagram on the right, and at the same time that they moved into the same line of interference with another NGSO satellite, they would cut back to using only F1, the band from which they had primary allocation, and then when they moved back out of the interference zone, they would again use both bands. Now, this is a little bit different. It's two NGSO satellites, not a GSO and an NGSO . . . but this would make – this is very clearly the concept of how you implement online avoidance, and the diagram is just about the same as the '827 patent, in this case the GSO satellite is – is stationary with respect to the Earth, but they're still moving relative to each other. So as one of them moves through the other, they have to turn off the secondary and only use the primary use.” See, e.g., S-1170 at SSL0084653: 

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)
	See also, e.g., S-1170 at SSL0084670:  <u>Weideman Patent Evidence:</u> See, e.g., S-2271 at ¶ 8: ("The present invention also seeks to provide a technique to selectively set the return link (uplink) bandwidth according to a number of desired channels, or a bandwidth of desired channels."; <i>id.</i> at ¶ 13 ("For this reason retransmission of unwanted signals and noise by the satellite repeater is avoided by the use of a commanded or a preprogrammed reduction in bandwidth of a received band of frequencies, as the satellite orbits the earth."); ¶ 19 ("A filter controller has an output coupled to the filter for programming the filter bandwidth as the satellite orbits the earth for reducing an effect of feeder uplink interference on service downlink transmission power."))
[c] circuitry configured to establish an activated frequency mode to activate one of a GSO frequency band mode and an extended frequency spectrum mode based on information indicating a presence or an	<u>FCC Rules Evidence:</u> See, e.g., S-1210 at SSL1531124: ("Non-Government GSO FSS systems will be authorized to use downlink frequencies on a priority basis in the 17.70-18.80 and 19.70-20.2 GHz bands. . . . We designated non-Government GSO FSS systems on a secondary priority basis in the 18.80-19.70 GHz [NGSO] band segments. As a secondary user in these band segments, GSO FSS operators shall not cause harmful interference to stations of a primary service, or higher priority FSS system . . .").

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

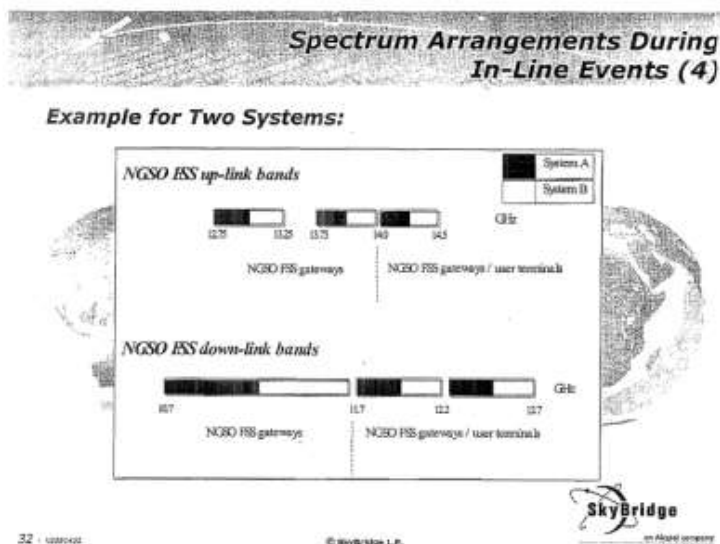
'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)												
absence of an interference situation with an NGSO satellite system; and	See also, e.g., S-1210 at SSL1531123 Table: <u>Downlink Band 17.70 - 20.2 GHz</u> <table><tr><td>GSO/FSS FIXED ngso/fss</td><td>NGSO/FSS FIXED gso/fss</td><td>MSS FL. FIXED gso/fss</td><td>GSO/FSS ngso/fss</td></tr><tr><td>1100 MHz</td><td>500 MHz</td><td>400 MHz</td><td>500 MHz</td></tr><tr><td>17.70</td><td>18.80</td><td>19.30</td><td>19.70 20.20 GHz</td></tr></table> See, e.g., S-1210 at SSL1531121: ("To ensure non-interfering operations, we will require all secondary operators to submit to the Commission a technical demonstration that it can operate on a non-harmful interference basis to the type of satellite system with licensing priority.") <u>SkyBridge Filing Evidence:</u> See, e.g., S-1170 at SSL0084653:  15 - 12250425 © SkyBridge L.P. SkyBridge an Alcatel company	GSO/FSS FIXED ngso/fss	NGSO/FSS FIXED gso/fss	MSS FL. FIXED gso/fss	GSO/FSS ngso/fss	1100 MHz	500 MHz	400 MHz	500 MHz	17.70	18.80	19.30	19.70 20.20 GHz
GSO/FSS FIXED ngso/fss	NGSO/FSS FIXED gso/fss	MSS FL. FIXED gso/fss	GSO/FSS ngso/fss										
1100 MHz	500 MHz	400 MHz	500 MHz										
17.70	18.80	19.30	19.70 20.20 GHz										

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

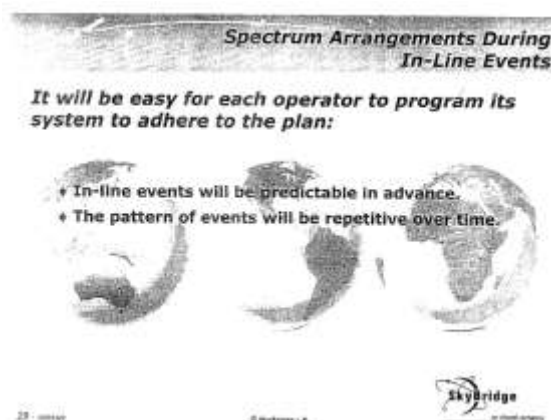
'827 Patent Claim 7

Obviousness Combinations with AtContact (2004)

See also, e.g., S-1170 at SSL0084670:



See also, e.g., S-1170 at SSL0084667:



See also, e.g., S-1170 at SSL0084651:

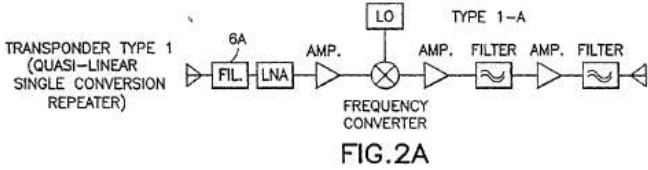
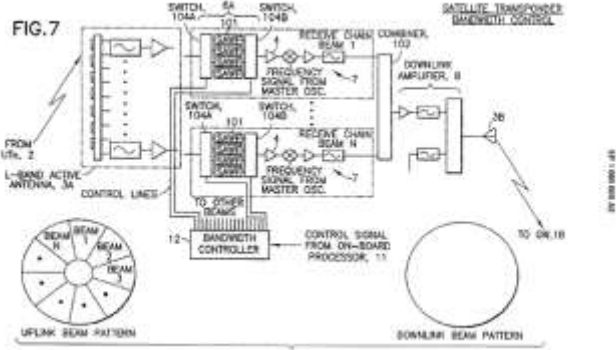
(“Spectrum sharing via avoidance of in-line events solves the above problems . . . supported by majority of applicants . . . is spectrum efficient . . . only satellites in interference configurations need to take steps to mitigate . . . leaves operators free to use all of the spectrum for as much of the time as possible.”)

Weideman Patent Evidence:

See, e.g., S-2271 at ¶ 8:

(“The present invention also seeks to provide a technique to selectively set the return link (uplink) bandwidth according to a number of desired channels, or a

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,068,827

'827 Patent Claim 7	Obviousness Combinations with AtContact (2004)
	bandwidth of desired channels.”; <i>id.</i> at ¶ 13 (“For this reason retransmission of unwanted signals and noise by the satellite repeater is avoided by the use of a commanded or a preprogrammed reduction in bandwidth of a received band of frequencies, as the satellite orbits the earth.”); ¶ 19 (“A filter controller has an output coupled to the filter for programming the filter bandwidth as the satellite orbits the earth for reducing an effect of feeder uplink interference on service downlink transmission power.”) <i>See also, e.g.,</i> S-2271 at Figs. 2A & 7:  FIG. 2A  FIG. 7
[d] a transmitter configured to transmit in one of the GSO frequency band and in the NGSO frequency spectrum based on the activated frequency spectrum mode.	<i>See above.</i>

APPENDIX 2

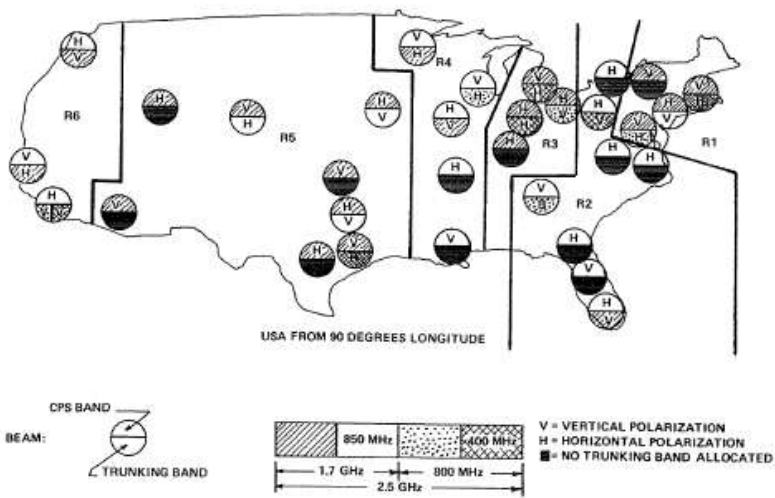
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	MITRE (1982)
1. [a] A spot beam satellite comprising: an antenna system configured to create a beam pattern having a plurality of different colors,	<u>See, e.g., Trial Tr. at 2246-47 (Dr. Schindall Testimony):</u> Q. Professor Schindall, in your opinion, does MITRE satisfy claim element 1(a) of the '875 patent, meaning the spot beam satellite with an antenna system, a beam pattern, and a plurality of different colors? A. Completely. I excerpted the abstract where it talks about a multi-beam system and a design where it talks about an antenna system. <u>See also, e.g., S-1165 at Abstract:</u> ("The paper summarizes a feasibility study of a multibeam FDMA satellite system operating in the 30/20 GHz band. . . . Multibeam satellite operation reduces the DC power demand and allows reuse of the available bandwidth. Interferences among the beams are brought to acceptable levels by appropriate frequency assignments. A transponder design is presented") <u>See also, e.g., S-1165 at Section 2:</u> ("The power consumption is minimized by using a high-gain antenna system.")
[b] wherein a color has a unique combination of frequency band and polarization,	<u>See, e.g., Trial Tr. at 2247 (Dr. Schindall Testimony):</u> Q. [S]ir, does MITRE FDMA anticipate claim element 1(b) where color has a unique combination of frequency and polarization? A. Sure. At the bottom of the chart I've shown the frequency division. They divided the frequency band into - - the frequency into four separate sub-bands which would be colors and the polarization of those colors are actually shown in the chart up above <u>See also, e.g., S-1165 at Fig. 2:</u> <u>See also, e.g., S-1165 at Section 2.3:</u> ("Figure 2 shows the allocation of sub-bands and polarizations for all regions.").

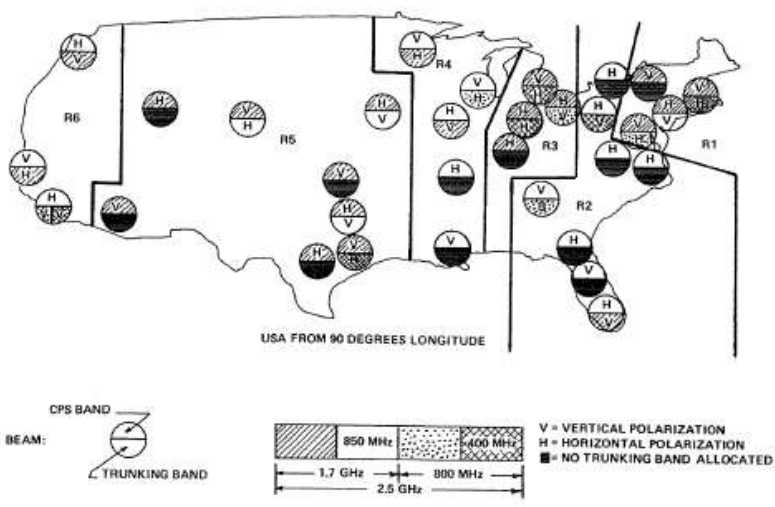
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	MITRE (1982)
[c] the spot beam satellite being configured to receive data from a plurality of service beams and from at least one feeder beam, each service beam having an associated service beam coverage area and the at least one feeder beam having an associated feeder beam coverage area,	<u>See, e.g., Trial Tr. at 2247-48 (Dr. Schindall Testimony):</u> Q. [D]oes MITRE anticipate claim element 1(c) which talks about the satellite receiving data for a plurality of service beams that have their own service beam coverage areas and from at least one feeder beam with a feeder beam coverage area? A. Yes, it does, and I need to explain a little bit of the nomenclature because this was 30 years earlier, and there was no Internet. So there were no gateways. So in MITRE, the circle represents a beam, and MITRE used some of the beams. They would lay down essentially two beams on top of each other, a service beam and a - - and a feeder beam. The service beam – CPS stands for – I’m looking at the circle on the left-hand side, and above it, you – it indicates the CPS band in the top and the trunking band in the bottom. The CPS band stands for customer premise equipment, and that’s what they mean by a user terminal, and the half circle at the bottom called a trunking band, well, in those days you didn’t have the Internet, but telephones used what they called trunk lines to carry the signals between major cities. And so the trunk lines and the telephone service were the same name and function as the fiber cable that you now use for trunking Internet signals back and forth between cities. Q. And so, in your view, sir, are the CPS beams depicted in MITRE FDMA, do they satisfy the service beam and service beam coverage area requirements of claim element 1(c)? A. Exactly. Q. And do the feeder beams – excuse me – the trunking bands, the trunking beams reflected in MITRE, did those satisfy the feeder beam and feeder beam coverage area limitations in 1(c)? A. Exactly. <u>See also, e.g., S-1165 at Page 65:</u> (“The ground segment consists of Customer Premises Services (CPS) terminals that give direct satellite access for local users, and trunking terminals that support high volume multiplexed traffic. According to a traffic model provided by NASA, the network consists of 2200 CPS terminals with a total peak-hour traffic of 3 GB/s and 39 trunking terminals with a total traffic of 6 GB/s. Cross traffic of 0.8 GB/s between the two services is also envisaged. . . .”)

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	MITRE (1982)
	<u>See also, e.g., S-1165 at Fig. 2:</u>  Fig. 2 The regional beam plan showing frequency and polarization assignments. 70
[d] wherein the feeder beam coverage area is proximate to one or more of the service beam coverage areas,	<u>See, e.g., Trial Tr. at 2249:</u> Q. Looking at claim elements 1(d) and 1(e), and those talk about having feeder beam coverage areas that's proximate to service beams and using different colors from those proximate service beams. Does MITRE FDMA anticipate claim elements 1(d) and 1(e)? A. Yes, it does. Q. And can you explain to the jury what you've shown here? A. Sure. I've taken the MITRE map of the gateways, and I've taken the - - and the service beams, and in the upper right-hand corner where I put a green square, I enlarged that green square to show the gateways over the New England area and New York, and the gateway over roughly New York has a feeder beam or trunking beam which is the bottom half that I highlighted in blue, which is using the white frequency spectrum with a vertical polarization. The proxiamte beams to that, that beam itself is proximate to itself. So you see the slashes horizontal polarization code on the top half of that beam, and then the other proximate beams would be the one above it to the left and above it to the right and below it to the left, and all of them are using the slashed vertical polarization which indicates that all four proximate beams are using different colors.

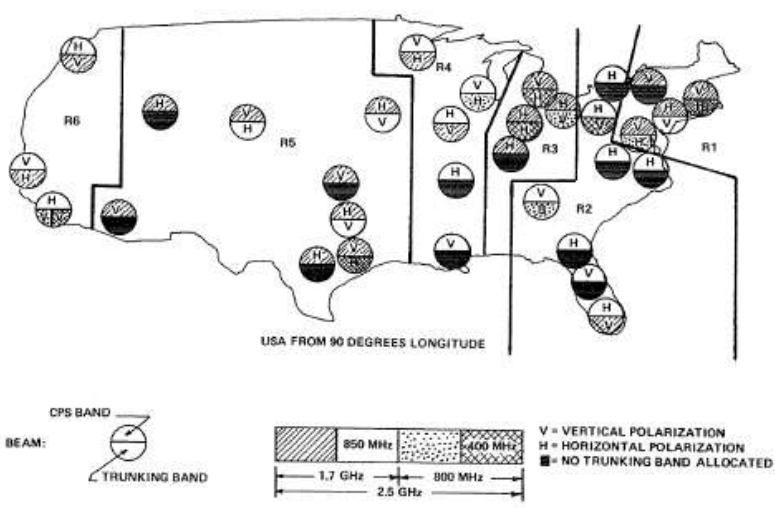
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	MITRE (1982)
	<u>See also, e.g., S-1165 at Section 1.3:</u> (“Frequency reuse is possible with multibeam satellite antennas. Beams that are sufficiently spatially separated can operate in the same frequency band with acceptably low co-channel interference (see section 3.1) Based on typical radiation patterns, the following rules ensure acceptable low interference: Beams that lie farther apart than three beamwidths (from beam center to beam center) can operate without restrictions in the same frequency band. Beams that lie between three and two beamwidths apart can operate in the same frequency band only if they are cross-polarized. Beams that lie closer than two beamwidths apart cannot operate in the same band regardless of their polarization.”). <u>See also, e.g., S-1165 at Page 70:</u>  Fig. 2 The regional beam plan showing frequency and polarization assignments. 70
[e] wherein the at least one feeder beam and a service beam associated with each of the one or more service beam coverage areas proximate to the feeder beam coverage area are allocated	<u>See above.</u>

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	MITRE (1982)
different colors from the beam pattern, such that signals associated with different colors differ by a frequency band, a polarization, or both a frequency band and a polarization,	
[f] wherein the feeder beam coverage area is not proximate to one or more of the service beam coverage areas, and	<u>See, e.g., Trial Tr. at 2250:</u> Q. [P]rofessor Schindall, does the MITRE reference anticipate claim elements 1(f) and 1(g)? And that talks about the same at least one feeder beam being not proximate to other service beam coverage areas and using a same color from a set of colors that's allocated to each of the non-proximate service beams. A. Yes. If you look at the beam – same beam that we talked – the same feeder or trunking beam that we talked about over New York – that's at the upper right of the diagram expanded – and now look at the beam that's over roughly San Francisoc at the left-hand side of the beam, and that's been expanded as well, you see that the – the service or CPS beam, the upper half of that – of the San Francisco beam is the white vertical polarization, and that's the same white vertical polarization that was used by the trunking beam over New York. And so that means that the set of colors includes the color of the San Francisco gateway, which is the white V, and therefore, the set of colors allocated to a service beam . . . includes a set of colors associated with each of the one or more service beam coverage areas not proximate to the feeder beam reuses at this point in the frequency, one color. * * * Q. Sir, what is this showing in terms of color reuse? A. What this is showing is that the San Francisco beam is reusing the same color as the New York beam.

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'875 Patent Claim 1	MITRE (1982)
	<u>See also, e.g., S-1165 at Page 70:</u>  Fig. 2 The regional beam plan showing frequency and polarization assignments. 70
[g] wherein a set of colors allocated to a service beam associated with each of the one or more service beam coverage areas not proximate to the feeder beam coverage area includes at least one same color allocated to the at least one feeder beam, such that signals associated with the same color have the same frequency band and polarization.	<i>See above.</i>

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'875 Patent Claim 1	AMC-17 (2004)
1. [a] A spot beam satellite comprising: an antenna system configured to create a beam pattern having a plurality of different colors,	<u>See, e.g., Trial Tr. at 2259 (Dr. Schindall Testimony):</u> Q. Sir, let's talk about AMC-17 in relation to the claim language. Did you find AMC-17 anticipates claim element 1(a), the spot beam satellite, with an antenna, a beam pattern in different colors? A. Yes, I did. Q. And what is that based on, sir? A. That's based on the – I showed you two illustrations here showing the spot beam coverage area, the large – let's see, and the satellite with the – with the antennas to illuminate that coverage. <u>See also, e.g., S-1446 at 2-18:</u> <u>See also, e.g., S-1450 at SSL0101969:</u>

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'875 Patent Claim 1

[b] wherein a color has a unique combination of frequency band and polarization,

AMC-17 (2004)

See, e.g., Trial Tr. at 2259 (Dr. Schindall Testimony):

Q. Sir, does AMC-17 satisfy 1(b), meaning a color has a unique combination of frequency and polarization?

A. Yes, it does. The frequency plan that I showed you before shows the colors and polarization, and the table on the right shows the same thing.

See also, e.g., S-1446 at 2-6:

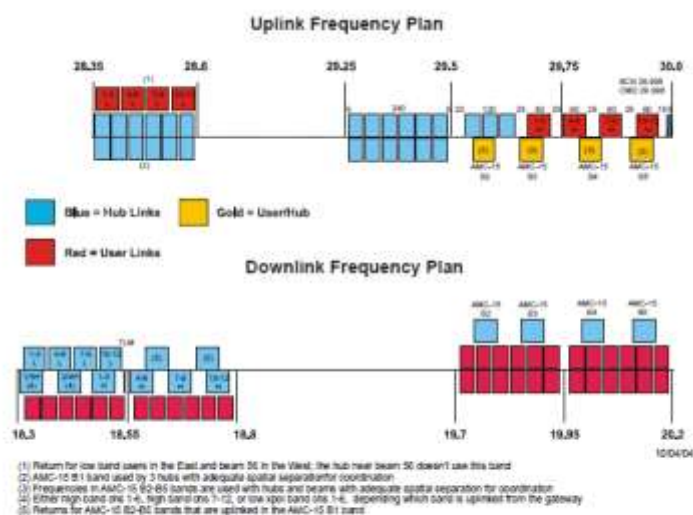


Figure 2.2-1. Baseline 12-GHz and Optional 15-GHz Asymmetrical Frequency Plan

The hubs use 28.35-28.6 GHz RHCP, 29.25-29.5 GHz on both polarizations, and 29.5-29.625 GHz RHCP to uplink the forward channels. The 29.5-30 GHz band is shared between hubs and users. The hubs uplink 3 channels in the lower 125 MHz of this band.

See also, e.g., S-1446 at 4-1:

Table 4-1. Ka-Band Payload Overview	
Number of beams	67 User beams 11 Gateways
Bandwidth	12 GHz, 2:1 asymmetric gateway to user bandwidth
Frequency bands	Receive: 28.35 to 28.6 GHz and 29.25 to 30.0 GHz Transmit: 18.3 to 18.8 GHz and 19.7 to 20.2 GHz
Polarization	RHCP/LHCP
MLO redundancy	MLOs are 3-for-1 redundant
Linearized channel amplifier/TWTA	55-W, 80-W, 90-W, and 130-W TWTA's
EIRP	Refer to Tables 2.4-1 through 2.4-4
G/T	Refer to Tables 2.4-5 through 2.4-6
C/I	Refer to Tables 2.4-xx

[c] the spot beam satellite being configured to receive data from a plurality of service beams and

See, e.g., Trial Tr. at 2247-48 (Dr. Schindall Testimony):

Q. Sir, does AMC-17 anticipate claim element 1(c)? And, again, that's the spot beam satellite receiving data from a plurality of service beams, service beam coverage areas, and from at least one feeder

Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	AMC-17 (2004)
from at least one feeder beam, each service beam having an associated service beam coverage area and the at least one feeder beam having an associated feeder beam coverage area,	beam with a feeder beam coverage area? A. Yes, it does. The table shows that there are 67 user beams and 11 gateway beams, and on the satellite, the four lower antennas are for user beams, but you can see that there was a separate large dedicated antenna to provide tight hub spacing in the western U.S. Those are the feeder beams. * * * Q. How can you tell, sir, that there's a feeder beam coverage area associated with the gateways you mentioned? A. Well, there actually has to be a feeder beam coverage area. The only way a satellite has to communicate with the Earth is to project a beam from an antenna. And so this shows that there is an antenna projecting a beam. There simply wouldn't be any other way to implement that. Q. [S]ir, did you consider feeder beam seven from the AMC-17 proposal in relation to the '875 claim one and 12? A. Yes, I did. Q. And in your opinion, does feeder beam seven satisfy the definition of a feeder beam? A. Yes, it does. And to explain the Court's definition of a feeder beam requires that it relays information to subscriber terminals located in the service beam, and here I've gone and looked at the actual diagram of the satellite, and you can see that hub seven or feeder beam seven communicates with service beam 67. <u>See also, e.g., S-1446 at Page 4-1:</u> (disclosing for "number of beams" that there are "67 user beams" and "11 Gateways")

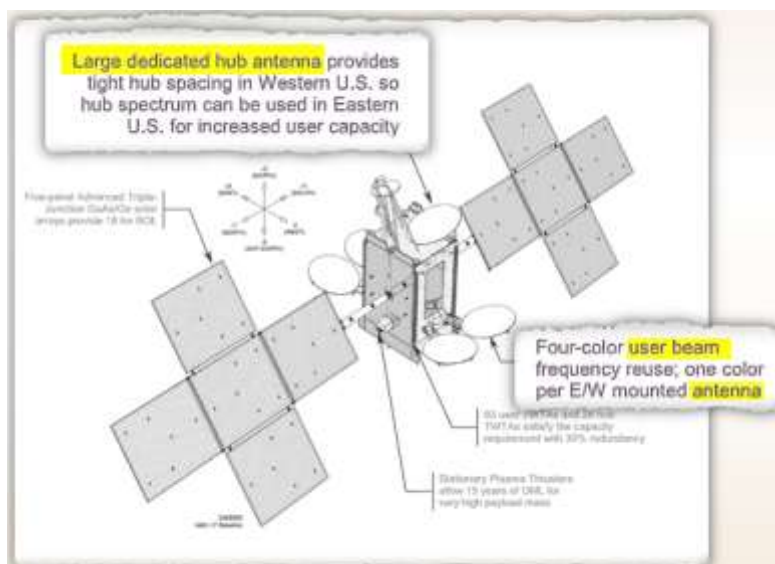
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1

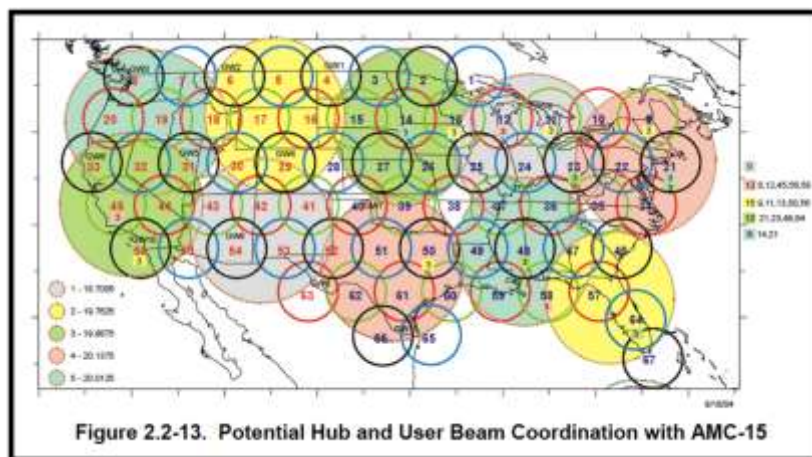
AMC-17 (2004)

Table 4-1. Ka-Band Payload Overview	
Number of beams	67 User beams 11 Gateways
Bandwidth	12 GHz, 2:1 asymmetric gateway to user bandwidth
Frequency bands	Receive: 28.35 to 28.6 GHz and 29.25 to 30.0 GHz Transmit: 18.3 to 18.8 GHz and 19.7 to 20.2 GHz
Polarization	RHCP/LHCP
MLO redundancy	MLOs are 3-for-1 redundant
Linearized channel amplifier/TWTA	55-W, 80-W, 90-W, and 130-W TWTAs
EIRP	Refer to Tables 2.4-1 through 2.4-4
G/T	Refer to Tables 2.4-5 through 2.4-6
C/I	Refer to Tables 2.4-xx

See also, e.g., S-1450 at SSL0101969:



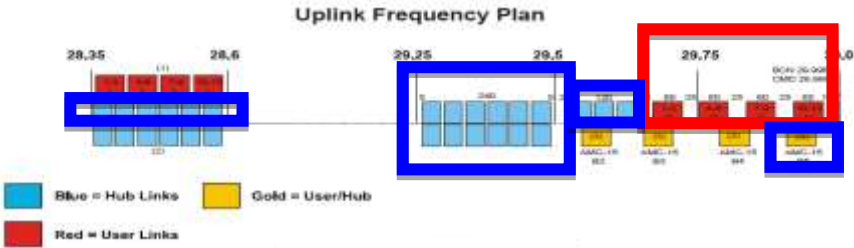
See also, e.g., S-1446 at 2-18:



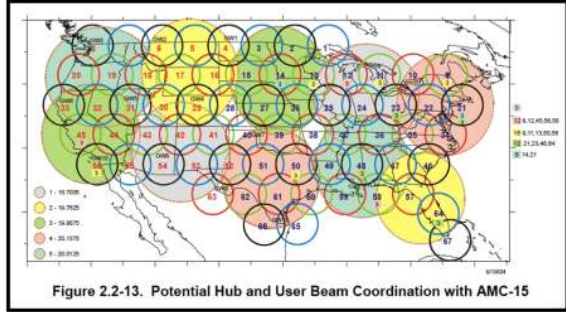
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 1	AMC-17 (2004)
	<u>See also, e.g., S-1446 at Page 4-13 (disclosing Hub 7 Down-Conversion Block Diagram).</u> <u>See also, e.g., S-1446 at Page 4-26 (disclosing Hub 7 Return Link Block Diagram).</u>
[d] wherein the feeder beam coverage area is proximate to one or more of the service beam coverage areas,	<u>See, e.g., Trial Tr. at 2261-62:</u> Q. Does AMC-17, and in particular, in relation to feeder beam seven, anticipate claim element 1(d), meaning it's – the feeder beam coverage area is proximate to one or more service beam coverage areas? A. Yes, it does. Q. And how does it do that? A. Well, in looking at the map, I've identified the proximate service beam areas because they overlap with the gateway, and that would be service beams 27, 28, 39, 40, 41, 51 and 52. <u>See also, e.g., S-1446 at 2-18:</u> Figure 2.2-13. Potential Hub and User Beam Coordination with AMC-15

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'875 Patent Claim 1	AMC-17 (2004)
[e] wherein the at least one feeder beam and a service beam associated with each of the one or more service beam coverage areas proximate to the feeder beam coverage area are allocated different colors from the beam pattern, such that signals associated with different colors differ by a frequency band, a polarization, or both a frequency band and a polarization,	<u>See, e.g., Trial Tr. at 2261-62:</u> Q. Does AMC-17 satisfy claim element 1(e), meaning that feeder beam, feeder beam seven, uses different colors from those proximate service beams? A. Yes, it does. I've identified on the chart with the red square – the – essentially the user links or the service links at the – that are associated with that gateway . . . and the feeder links are the blue – are enclosed by blue boxes over toward the left of the chart and again to the right on the bottom of the chart, and every one of the feeder links differs from the service links by a color – by a frequency or a polarization or both. Q. And is the evidence you relied upon to form that opinion from S-1446 at pages 2-6, Figure 2.2-1, page 2-13, Figure 2.2-8, and page 2-20, Figure 2.2-14? A. That's correct. <u>See also, e.g., S-1446 at Page 2-6, Fig. 2.2-1 (with blue and red box annotations illustrating Dr. Schindall's testimony):</u>  <u>See also, e.g., S-1446 at Page 2-13, Fig. 2.2-8 (Gateway 7 to User Frequency Plan).</u> <u>See also, e.g., S-1446 at Page 2-20, Fig. 2.2-14 (Service Beam Uplink Frequency Plan).</u>
[f] wherein the feeder beam coverage area is not proximate to one or more of the service beam coverage areas, and	<u>See, e.g., Trial Tr. at 2262-63 (Dr. Schindall Testimony):</u> Q. Does AMC-17 satisfy claim element 1(f) wherein the feeder beam coverage area is not proximate to one or more of the service beam coverage areas? A. Yes, it does. Q. And is – and have you depicted that by showing feeder beam seven

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'875 Patent Claim 1	AMC-17 (2004)
	is not proximate to all of the other service beam coverage areas other than the ones you just talked about? A. That is correct. What I've done is I've removed the proximate beams and I'm looking at the beams that use the same color as the gateway that are non-proximate to that gateway. <u>See also, e.g., S-1446 at 2-18:</u> 

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'875 Patent Claim 1	AMC-17 (2004)
[g] wherein a set of colors allocated to a service beam associated with each of the one or more service beam coverage areas not proximate to the feeder beam coverage area includes at least one same color allocated to the at least one feeder beam, such that signals associated with the same color have the same frequency band and polarization.	<u>See, e.g., Trial Tr. at 2263-64 (Dr. Schindall Testimony):</u> Q. Does . . . AMC-17 satisfy claim element 1(g), meaning feeder beam seven uses a same color from a set of colors allocated to non-proximate service beams? A. Yes, it does. Q. And how does it do that, sir? A. Well, what I've shown here are the user link frequencies that are used in those gateways in the red boxes. Q. I'm sorry. Those service beams, sir? A. Yes, user links are the service beams, and I've also circled in the blue boxes the - - the hub links or feeder beam links that are used by gateway seven. And, as you can see, over on the left-hand side of the chart, the - the set of color allocated to the service beam associated with each of the one or more service beam coverage areas not proximate to the feeder beam coverage area uses at least one same color. Q. Okay. And is the evidence that you cited for that from S-1446, pages 2-6, Figure 2.2-1, page 2-13, Figure 2.2-8, and page 2-20, Figure 2.2-14? A. That is correct. Q. [B]ased on your review of AMC-17, does it anticipate every single limitation of claim one of the '875 patent? A. Yes, it does. <u>See also, e.g., Trial Tr. at 2253-54 (Dr. Schindall Testimony):</u> Q. [I] see you've put together a slide that talks about the executive summary. Could you just explain to the jury why you put this slide together? A. Sure. Well, to me this slide is very dramatic. This is something that was offered by SS/L in 2004 It was offered by SS/L well before the ViaSat-1 satellite. And look at this. In the executive summary, it says "Design feature. All hu[b]s are located in western CONUS, all of them, and benefit enables reuse of hub frequencies in eastern CONUS to increase the user capacity in populated areas. Q. And what does that mean? I haven't heard the word 'hub' before. What's the context?

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'875 Patent Claim 1	AMC-17 (2004)
	A. A hub is a gateway. So what this is is a system – what this portion of the system represents is users in the eastern Continental United States. The gateway is located in the western United States to enable full frequency reuse. * * * Q. [S]ir, you mentioned that AMC-17 has two parts of the system. So can you explain looking at the frequency plan what you mean by that? A. Yes. The uplink frequency band includes two segments. There's a low band segment . . . It uses some low band frequencies. That's what I'd call them, which go from 28.35 to 28.6 gigahertz. And in that low band, both the user terminals, which are the red user links, and the blue hub links are reusing the same frequencies, and then it has a high band portion which goes from roughly 29 to 30 gigahertz, but I'm going to be concentrating on the low band coverage. <u>See also, e.g., Trial Tr. at 2257 (Dr. Schindall Testimony):</u> Q. [A]nd I see that you've put the next slide with some sort of overlay beams over the center part of the United States, and what is this map now showing in combination? A. Well, essentially, SS/L – the AMC-17 was requiring full CONUS coverage but with increased capacity in the eastern part of the United States. So what SS/L did is they used the lower band frequency to provide the gateway separation for increased coverage in the eastern United States, and then they used a higher frequency to communicate with other beams that you see covering the remainder of the Continental United States. So that's the way they did it basically. Q. Sir, did you render an opinion as to whether it would have been novel or inventive with a customer requirement to eliminate that coverage to reassign the frequencies to the gateway and users? A. Yes, I did. Q. And what is your opinion? A. My opinion is that taking away – you know, they built it up this way. So taking away the piece that covers the western United [States] – they were just meeting the business requirement, just like ViaSat specified a business requirement that allowed not covering the western United States. [SES]-Americom wanted to cover the western part. So they superimposed beams in order to do that.

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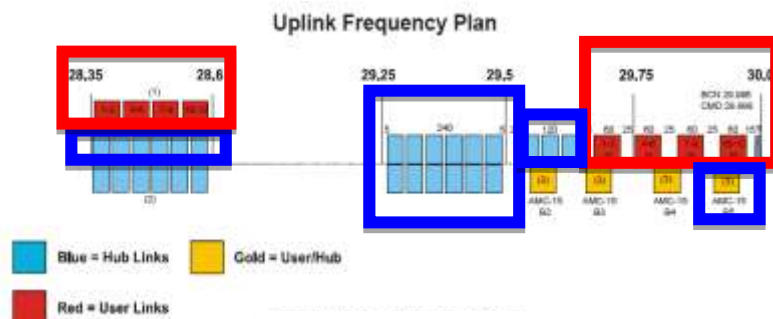
'875 Patent Claim 1

AMC-17 (2004)

See also, e.g., S-1450 at SSL0101970:

AMC-17 SATELLITE FEATURES AND PERFORMANCE	
Design Feature	Benefit
All hubs are located in Western CONUS, and each channel uses only a single hub for forward and return	- Enables reuse of hub frequencies in Eastern CONUS to increase user capacity in populated areas - Rain fade control is manageable from a single hub
- Forward channels that share a single power amplifier operate from the same hub - Standard 1500 km	- Provides flexibility to increase with SATC-10 - Enables reuse of hub frequencies in Eastern CONUS to increase user capacity in populated areas - Rain fade control is manageable from a single hub - SLC mode can be enhanced to minimize rain fade effects - High-gain heritage reduces schedule & performance risk - High-gain results over satellite life

See also, e.g., S-1446 at Page 2-6, Fig. 2.2-1 (with blue and red box annotations illustrating Dr. Schindall's testimony):



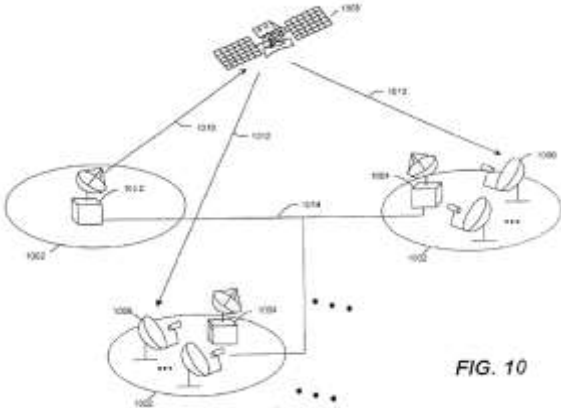
See also, e.g., S-1446 at Page 2-13, Fig. 2.2-8 (Gateway 7 to User Frequency Plan (Feeder Uplink)).

See also, e.g., S-1446 at Page 2-20, Fig. 2.2-14 (Service Beam Uplink Frequency Plan).

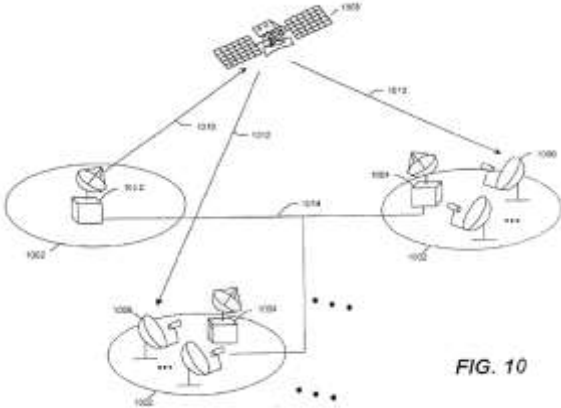
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'875 Patent Claim 12	Sharon Patent (2000)
12. The spot beam satellite of claim 1	<u>See above Claim 1 charts.</u> <u>See also, e.g., Trial Tr. at 2268-69:</u> Q. Let's take a look at the Sharon patent, and this is the first time the jury's seen it. So can you explain why you created this slide? A. I created this patent – I used this slide for two reasons, first of all, to demonstrate that the Sharon patent is using selective frequency and polarization. So it's using colors. And, actually, it's also noteworthy that this is the year 2000, and the Sharon patent says the current innovative concept envisions systems with about 100 spot beams, each of which has about 750 megahertz of bandwidth for each of two polarizations or 150 gigabits per second potential capacity. So people back in 2000 were well aware of the fact that technology was advancing to the point where this could be achieved. <u>See also, e.g., S-1845 at Abstract:</u> ("A satellite communications system having ground user terminals, hubs, and a geosynchronous satellite. The satellite generates a network of spot beam coverage areas on the earth. . . .") <u>See also, e.g., S-1845 at 6:36-40:</u> ("The current inventive concept envisions systems with approximately 100 spot beams, each of which has ~750 MHz bandwidth x 2 polarizations, or 150 Gbps potential capacity.")
wherein the satellite is configured to receive data from a second at least one feeder beam, the second at least one feeder beam being associated with a second feeder beam coverage area,	<u>See, e.g., Trial Tr. at 2268-69:</u> Q. Sir, can you tell the jury why you put this next slide together in relation to claim 12 talking about that remote feeder beam? A. Sure. I'm using Sharon only for obviousness. I need to point that out, but in Sharon they have a drawing, Figure 10, which shows a remote feeder beam, and it points out that the remote hub, which is [a] feeder beam, may be located in a remote portion of the CONUS where the demand for satellite service is low such as in the northern plain states. Q. And why would someone want to put a remote hub in the northern Plains states where demand for satellite service is low? A. In order to achieve a higher frequency reuse.

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'875 Patent Claim 12	Sharon Patent (2000)
	Q. And do you think that's a novel concept? A. No. I think that actually goes back to the – that's why I wanted to describe to you the coloring rule, because if the beam is not proximate to other beams, there is no interference. It has geographic separation. I consider that to be elementary rule 101. <u>See also, e.g., S-1845 at Abstract:</u> ("A <u>satellite communications system</u> having ground user terminals, hubs, and a geosynchronous satellite. The satellite generates a network of <u>spot beam coverage areas</u> on the earth. . . . The hub may be located in the same spot beam coverage area as the first or the second user terminal or may be located in an altogether different spot beam coverage area. . . . The system enables asynchronous communications between each hub and the satellite to <u>maximize frequency re-use and overall capacity of the system.</u>") (emphasis added). <u>See also, e.g., S-1845 at Fig. 10:</u>  <u>See also, e.g., S-1845 at Col. 9:37-51:</u> ("FIG. 10 is an illustration of an exemplary embodiment operating in a <u>remote hub</u> broadcast configuration. Again, the SATCOM system comprises a series of spot beams 1002 originating from the satellite 1008 and illuminating the earth surface. At least one spot beam 1002 encompasses only a single, remote hub 1005. Each of the remaining spot beams 1002 encompass a number of ground terminals 1006 and a single hub 1004. Typically, the spot beam that encompasses the remote hub is the same size as the other spot beams in the network. However, the remote hub may be located in a remote portion of the CONUS, where the demand for satellite service is low, such as in the Northern Plain States. . . .").
wherein the second feeder beam coverage	<u>See above.</u>

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'875 Patent Claim 12	Sharon Patent (2000)
area is not proximate to any of the service beam coverage areas,	
and wherein the second at least one feeder beam is allocated all of the colors of the beam pattern.	<u>See, e.g., Trial Tr. at 2270:</u> Q. [L]ooking at the next set of excerpts that you've pulled together from the Sharon patent, can you explain to the jury why you thought these were important? A. Yeah. I just wanted to make it clear because the other one didn't – the previous slide didn't say it specifically, that Sharon had very definitely the observation that you could get full frequency reuse. SO here are three separate quotes on the use of the spatially isolated spot beam allows maximum frequency reuse, which provides increased data to the data capacity relative to the contiguous beam approach. He says that each spot beam is spatially isolated from every other spot beam, and that allows maximum frequency reuse, and he says by spatially isolating each spot beam from every other spot beam, sub-bands are not necessary, and the entire frequency band is available for use in every spot beam. He's just citing the 1977 textbook or 1979 textbook that I showed you.¹ <u>See also, e.g., S-1845 at Fig. 10:</u>  <u>See also, e.g., S-1845 at Col. 9:37-51:</u> ("FIG. 10 is an illustration of an exemplary embodiment operating in a <u>remote hub</u> broadcast configuration. Again, the SATCOM system comprises a series of spot beams 1002 originating from the satellite 1008 and illuminating the earth surface. At least one spot beam 1002

¹ The 1970s textbook refers to Spilker, James J., *Digital Communications by Satellite* (1977). See S-1286 at Page 190 ("Fig. 7-9. Frequency reuse with a multibeam antenna. Frequency reuse provides contiguous coverage of the earth using frequency and polarization separation right and left hand (R & L) of the antenna beams in (a). This antenna provides four separate types of antenna beams as shown at the right in (b).").

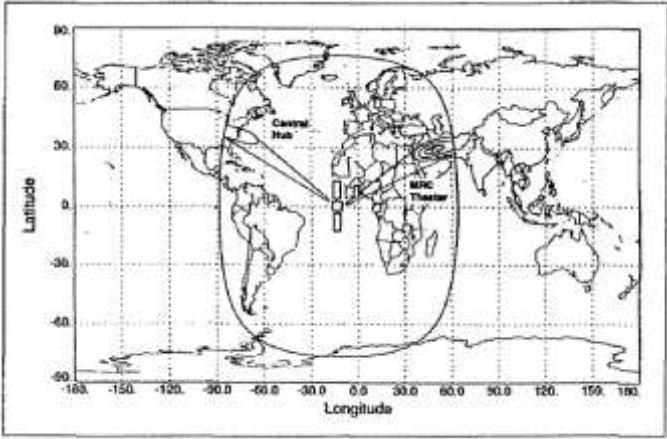
Exemplary Trial Evidence for Invalidity of U.S. Patent No. 8,107,875

'875 Patent Claim 12	Sharon Patent (2000)
	encompasses only a single, remote hub 1005. Each of the remaining spot beams 1002 encompass a number of ground terminals 1006 and a single hub 1004. Typically, the spot beam that encompasses the remote hub is the same size as the other spot beams in the network. However, the remote hub may be located in a remote portion of the CONUS, where the demand for satellite service is low, such as in the Northern Plain States. . . .”). <u>See also, e.g., S-1845 at 6:49-54:</u> (“The use of spatially isolated spot beams allows <u>maximum frequency re-use</u>, which provides increased data capacity relative to the contiguous beam approach in which the beam overlap requires a frequency assignment approach and adjacent beams use only a portion of the band (4 and 7 sub-band assignments are common.”) <u>See also, e.g., S-1845 at 7:55-64</u> (“FIGS. 7, 8, 9, 10 and 17 are illustrations of exemplary embodiments of the invention. FIG. 7 illustrates a multibeam SATCOM system 20 with a hub 706 in every beam 702 operating in an intra-spot beam mode. In the SATCOM system 20, each spot beam 702 is spatially isolated from every other spot beam. This allows the SATCOM system 20 to achieve <u>maximum frequency re-use</u>. In contrast, for SATCOM systems in which the spot beams are contiguous, or overlap, signals from adjacent spot beams cause interference.”) (emphasis added). <u>See also, e.g., S-1845 at 8:9-14:</u> (“By spatially isolating each spot beam from every other spot beam according to an embodiment of the invention, there is no interference. Therefore, sub-bands are not necessary and the <u>entire frequency band is available for use in every spot beam</u>. Spatially isolating spot beams increases the bandwidth available for signal transmission by a factor of four.”) (emphasis added).

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'875 Patent Claim 12	Asato Paper & ITU Radio Regulations (1995)
12. The spot beam satellite of claim 1	<u>See above Claim 1 charts.</u> <u>See also, e.g., Trial Tr. at 2271-72:</u> Q. [S]ir, you mentioned that you considered another piece of prior art, the Asato paper. I'm showing you a slide you prepared. Can you just explain to the jury what's important about this reference? A. This reference is also important because it shows that by locating a gateway completely geographically separate from the spot beams, you can achieve full frequency reuse and that that was anticipated. This system is actually a – it's a military system. . . . * * * Q. [S]ir, you were mentioning that sometimes the military can lead the way. Can you explain what you mean by that? A. Sure. The military obviously needs satellites for reconnaissance and surveillance and other applications, and they simply have a lot more money to spend on it than commercial companies do. So many times military projects actually blaze the way for the technologies that will later be used in commercial satellites. So you notice this one goes all the way back to 1995, but they were proposing a Ka Band system that would have a separate feeder beam. <u>See generally S-1180 & S-685.</u>
wherein the satellite is configured to receive data from a second at least one feeder beam, the second at least one feeder beam being associated with a second feeder beam coverage area,	<u>See, e.g., Trial Tr. at 2272-73:</u> Q. Let's go ahead and take a look at the paper itself, and I see you've pulled out a figure and some text. Can you explain this slide for the jury? A. Sure. The figure is showing the central hub, which is the gateway, and that is located in the eastern portion of the United States. It's a little bit hard to tell exactly here, and the beams themselves are illuminating, not surprisingly I guess, the Middle East, and it says that the central hub serves as a gateway to the public switch telecommunications network, and because assuming sufficient angular separation – and there's a lot of angular separation here – the separation of a theater from its sustaining bas[e]s allows frequency reuse by means of spatial isolation between the theater beams and a dedicated narrow band feeder link. Frequency reuse opens up

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'875 Patent Claim 12	Asato Paper & ITU Radio Regulations (1995)
	additional bandwidth for a short access on the return path and high capacity on the forward path. Q. And, just to be clear, are those [theater] beams that are over the Middle East, are those service beams? A. The [theater] beams over – I tend to do that. I apologize. The [theater] beams over the Middle East are service beams. <u>See, e.g., S-1180 at Fig. 2:</u>  Figure 2. SWA MRC Scenario <u>See, e.g., S-1180 at Page 724:</u> (“Figure 2 also shows how a satellite placed at a current DSCS III orbital slot could have a feeder link that reaches back to a central hub located in CONUS.”). (“One implication of the asymmetric traffic pattern between a central hub and user terminals is that the central hub can provide an ‘advantaged’ feeder link. An ‘advantaged’ feeder link considerably relaxes the uplink transmit EIRP and downlink G/T required of ‘disadvantaged’ mobile and manportable user terminals. The ‘classical’ VSAT and mobile SATCOM architecture designs use central hubs and take advantage of such ‘advantaged’ feeder links. For VSAT applications, the central hub is typically interconnected to a central information resource for applications such as financial transactions, reservations, and shared data bases; for mobile SATCOM, the central hub serves as a gateway to public switched telecommunications networks.”)
wherein the second feeder beam coverage	<u>See above.</u>

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'875 Patent Claim 12	Asato Paper & ITU Radio Regulations (1995)
area is not proximate to any of the service beam coverage areas,	
and wherein the second at least one feeder beam is allocated <u>all of the colors of the beam pattern</u> .	<u>See, e.g., Trial Tr. at 2273-74:</u> Q. [A]nd so based on the information in the paper, does the remote feeder beam in the U.S. reuse all of the colors of the beam pattern? A. Yes, it does, and what I've shown here is that the theater uplinks which are the service beams are using 1.5 gigahertz bandwidth and by looking at the ITU—ITU is the International Telecommunications Union. It defines what frequencies are available are from 29.5 to 31 gigahertz. And then for the – for the feeder uplink, it's using the frequency range from 27.5 to 31 which means that it's using – that includes the 29.5 to 31 gigahertz being used by the service beam. So it's complete reuse. Q. [A]nd is that also based on S-658, the ITU radio regulations? A. Yes, it is. * * * Q. And, sir, in your view, would one of ordinary skill in the art be familiar with the ITU radio regulations? A. Yes. Q. [D]id you put together the next slide just to show the jury a demonstrative of what you're talking about? A. Yes. What I've shown here is a bar chart showing the frequency band and the service uplink using 29.5 to 31 is highlighted in blue. The feeder uplink uses the wider part that goes from 27.5 all the way up to a separate band, but it completely reuses the service uplink frequencies. <u>See, e.g., S-1180 at Page 726:</u> ("On the forward path, the central hub permits dual polarization on the feeder link. For the Ka-band uplink, 27.5 GHz to 31.0 GHz, or a 3.5 GHz bandwidth, has been allocated for uplink FSS; and for a Q-band uplink, 42.5 GHz to 43.5 GHz, or a 1.0-GHz uplink bandwidth, has been allocated for uplink FSS. Thus with dual polarization, up to 9.0 GHz could possibly be made available at EHF for a feeder uplink.").

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See, e.g., S-1180 at Fig. 6:

(disclosing “FDM Feeder Uplink from Central Hub [e.g., 9.0 GHz bandwidth for 44/30 GHz FSS]”)

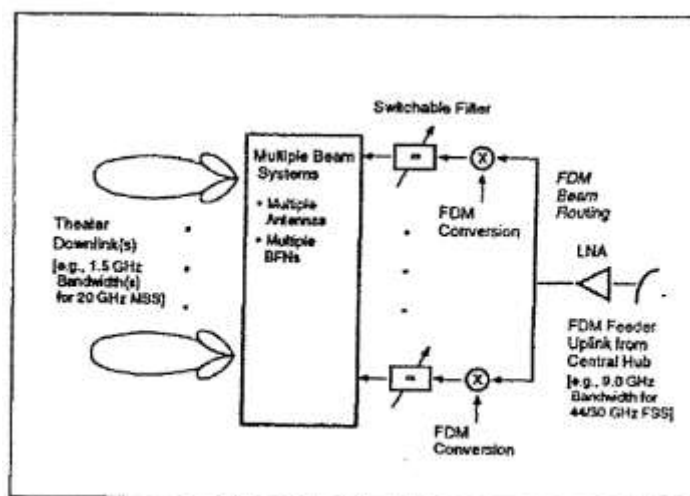


Figure 6. Payload Design -- Forward Path

See, e.g., S-1180 at Fig. 4:

(disclosing “Theater Uplink(s) (e.g., 1.5 GHz Bandwidth(s) for 30 GHz MSS”)

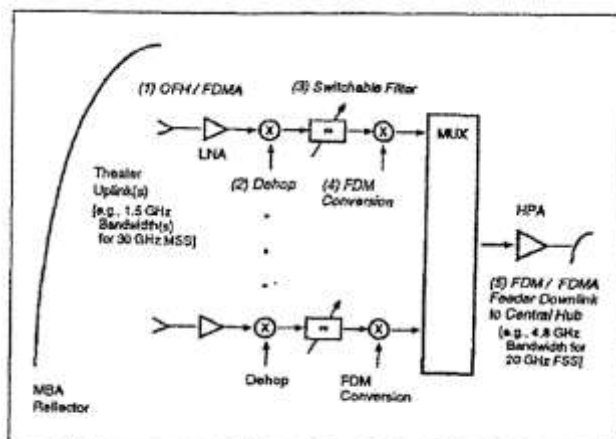


Figure 4. Payload Design -- Return Path

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'875 Patent Claim 12	Asato Paper & ITU Radio Regulations (1995)																					
	See, e.g., S-1180 at Page 724: (“For International Telecommunications Union (ITU) regions 1 through 3, 1.5 GHz has been allocated for mobile satellite service (MSS) at 30/20-GHz.”) See, e.g., S-658 at SSL2234193: (disclosing 1.5 GHz allocated for mobile satellite service (MSS) from 29.5-31 GHz on the uplink (earth-to-space)) GHz 25.5 – 29.9 <table><tr><th colspan="3">Allocation to Services</th></tr><tr><th>Region 1</th><th>Region 2</th><th>Region 3</th></tr><tr><td>29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D Earth Exploration-Satellite (Earth-to-space) 882C Mobile-Satellite (Earth-to-space) 882B 883</td><td>29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 873E 882B 883</td><td>29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D Earth Exploration-Satellite (Earth-to-space) 882C Mobile-Satellite (Earth-to-space) 882B 883</td></tr></table> GHz 29.9 – 31.8 <table><tr><th colspan="3">Allocation to Services</th></tr><tr><th>Region 1</th><th>Region 2</th><th>Region 3</th></tr><tr><td>29.9 – 30</td><td colspan="2">FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883</td></tr><tr><td>30 – 31</td><td colspan="2">FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth) 883</td></tr></table>	Allocation to Services			Region 1	Region 2	Region 3	29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D Earth Exploration-Satellite (Earth-to-space) 882C Mobile-Satellite (Earth-to-space) 882B 883	29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 873E 882B 883	29.5 – 29.9 FIXED-SATELLITE (Earth-to-space) 882D Earth Exploration-Satellite (Earth-to-space) 882C Mobile-Satellite (Earth-to-space) 882B 883	Allocation to Services			Region 1	Region 2	Region 3	29.9 – 30	FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883		30 – 31	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth) 883	
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