IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

SMARTSKY NETWORKS, LLC,	)	
	)	
Plaintiff,	)	C.A. No. 22-266 (UNA)
	)	
v.	)	**PUBLIC VERSION**
	)	
GOGO BUSINESS AVIATION, LLC and GOGO INC.,	)	
	)	
	)	
Defendants.	)	

SMARTSKY'S OPENING BRIEF IN SUPPORT OF ITS MOTION FOR PRELIMINARY INJUNCTION

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I. INTRODUCTION

SmartSky moves for preliminary injunction to protect its position as a start-up company that recently launched its patented, flagship product. After more than ten years of development and building its infrastructure nationwide, at a cost of [redacted] SmartSky currently has the only air-to-ground ("ATG") wireless communication network for aircraft in-flight connectivity utilizing its patented beamforming technology operating with 60 MHz of the unlicensed spectrum. For well over a decade, Gogo has enjoyed an effective monopoly in the business aviation market for in-flight connectivity using an ATG network operating with licensed spectrum even though its network has not kept up with consumers' increasing demand for better performance and more data consumption. SmartSky's breakthrough technology now allows an "office in the sky" internet experience because it provides a giant leap forward in capacity of about *10 times* the average effective performance of Gogo's current 3G/4G system.

After a decade of failed attempts to increase performance by purchasing more licensed spectrum, Gogo decided to copy SmartSky's patented system using beamforming in the unlicensed spectrum, which SmartSky commercially launched in late 2021. With full knowledge of SmartSky's patents, Gogo has begun aggressively selling its infringing "5G" system. Gogo's actions are forcing SmartSky to compete with its own patented technology just as SmartSky is entering the market with its flagship product. Indeed, in promoting its accused 5G system, Gogo is touting specific features claimed in SmartSky's patents. Also, SmartSky recently defeated Gogo's validity challenge to one of the SmartSky's patents asserted in this case. In the two-player ATG market, Gogo's infringement is irreparably harming SmartSky by monopolizing "sticky" customers that rarely change ATG systems because of significant equipment costs. An injunction against Gogo's willful infringement is necessary because Gogo's actions are irreparably harming SmartSky at the critical time as SmartSky is entering the market with its patented technology.

II. NATURE AND STAGE OF THE PROCEEDINGS

SmartSky filed this action on February 28, 2022. Gogo has not answered or otherwise responded to the Complaint. SmartSky now moves for a preliminary injunction.

III. STATEMENT OF FACTS

A. SmartSky's Breakthrough ATG Network Using Beamforming in the Unlicensed Spectrum Revolutionized In-Flight Connectivity in Aircraft

SmartSky was founded in 2011 to develop and build a novel ATG wireless communication network mostly for business aviation air travelers. SmartSky's technology is designed to deliver best-in-class speed, capacity, and low latency to provide users seamless connectivity during air travel. (Stone Decl. ¶ 31.) SmartSky's breakthrough technology uses beamforming, software defined radio, and spectrum reuse while using 60 MHz of bandwidth in the unlicensed 2.4 GHz spectrum. (Stone Decl. ¶ 14.) In contrast, Gogo's current 3G/4G ATG network relies on the same limited licensed spectrum (only 3 MHz) that it has used for decades. (Stone Decl. ¶ 11.)

SmartSky's patented technology is a quantum leap forward as it allows for a roughly ten-fold increase or more in performance over Gogo's legacy ATG system. (Stone Decl. ¶¶ 31, 54; Goldberg Decl. ¶¶ 89-92.) Importantly, SmartSky's increased performance allows aircraft passengers to have internet in-flight connectivity ("IFC") like an office in the sky. For example, multiple passengers in an aircraft can have realtime, two-way communications that enables uninterrupted live videoteleconferencing with almost no discernable delay in the communications, while other passengers might be sending or receiving e-mails with large attachments, some surfing the web, and others using a VPN to access their corporate cloud. (Stone Decl. ¶ 18.)

SmartSky's ATG network implements patented phased array beamforming antennas that generate multiple beams and direct the beams to a small area, which allow the beams to be transmitted over a greater distance as opposed to an omnidirectional signal or shared sector-wide signal like that of typical 3G cellular systems. (Goldberg Decl. ¶ 84.) Because these beams are directed to a small area, multiple spatially-separated beams can be generated at the same frequency while avoiding harmfully interfering with each other, or with other unlicensed band transmissions. (Goldberg Decl. ¶¶ 84-85; Stone Decl. ¶ 19.)

SmartSky's ATG network implements a patented software-defined radio ("SDR") to perform the beamforming function. The SDR, which is recited in the claims of asserted U.S. Patent Nos. 9,312,947 (the "'947 Patent") and 11,223,417 (the "'417 Patent"), lowers costs and simplifies updates and other modifications to, among other radio functions, the antenna beamforming, by implementing radio components using software instead of implementing using hardware. (Stone Decl. ¶ 23.)

SmartSky also developed a patented ground antenna system that generates respective radiation patterns that are oriented toward the horizon and overlap to create a "wedge" architecture, which is the subject of asserted U.S. Patent Nos. 10,257,717 (the "'717 Patent) and 9,730,077 (the "'077 Patent"). (Goldberg Decl. ¶¶ 55, 62.) Directing radiation patterns toward the horizon substantially reduces interference with and from ground-based Wi-Fi in the unlicensed spectrum. (Goldberg Decl. ¶ 82.)

SmartSky's network also relies on patented seamless handoffs of communication links between beams originating from different ATG base stations as the aircraft moves, as recited in the asserted '947 and '417 Patent claims. (Goldberg Decl. ¶ 86.) By conducting seamless handoffs, the user notices no disruption in connectivity as the aircraft moves between beams.

Despite industry skepticism – especially from Gogo – that an unlicensed ATG network would ever be commercially viable (Cook Decl. ¶¶ 15, 17, 31), in late 2021, SmartSky announced the commercial launch of the first ATG network in the U.S. that uses unlicensed spectrum. At the National Business Aviation Association (NBAA) Business Aviation Convention & Exhibition (BACE) in October 2021 in Las Vegas, SmartSky operated numerous flights demonstrating its new ATG network, proving the impact of its patented beamforming technology, seamless handovers, and system architecture using the unlicensed spectrum. (Stone Decl. ¶ 26.)

SmartSky's patented ATG network has received strong reviews. With five FaceTime video calls occurring simultaneously, one industry expert noted that the "videos never buffered, not even once," and that "the clarity of the picture was pretty striking."[1] (Stone Decl. ¶ 27.) Another industry expert noted that "web surfing . . . was seamless with loading times similar to those I'm used to on the ground," Slack and FaceTime video calls were "crystal clear," and a Twitter live-stream was "flawless and consistent." (Stone Decl. ¶ 28.)

For years Gogo has dominated 85% of the business aviation IFC market, and it offers the only ATG network other than SmartSky's network. (Cook Decl. ¶ 8.) To date, notwithstanding SmartSky's superior performance, many customers are reluctant to switch to SmartSky because of Gogo's upcoming launch of its 5G network, which copies SmartSky's patented technology. (Stone Decl. ¶ 35; Cook Decl. ¶ 43.)

SmartSky's marketing strategy is based on its patented technology and superior performance. (Stone Decl. ¶ 34.) SmartSky is in the beginning stages of its early adoption phase with the first customers beginning to use its ATG Network, which will be SmartSky's primary

[1] *See* "Flying first, flying private: an NBAA travel tale," RunwayGirl Network, Oct. 22, 2021 (Ex. 25), available at https://runwaygirlnetwork.com/2021/10/22/flying-first-flying-private-an-nbaa-travel-tale/.

revenue source. (Stone Decl. ¶ 54.) SmartSky has invested more than [redacted] developing and patenting its technology and about [redacted] in building out its nationwide ATG network, which it expects to cover the full continental United States around the end of Q2 this year. (Stone Decl. ¶¶ 30, 54.) SmartSky now holds over 238 patents worldwide, including 104 U.S. patents, on various aspects of its ATG network. (Stone Decl. ¶ 14.) SmartSky has never licensed its patented ATG network technology. (Stone Decl. ¶ 61.)

B. Gogo Spent Years Attempting to Acquire More Licensed Spectrum to Improve Its ATG Network Performance

Gogo maintains it is the world's largest provider of IFC broadband services for the BA market. Gogo advertises that it has served the BA IFC market for more than 20 years. (Cook Decl. ¶ 8.) Since at least around 2008, Gogo has been the sole provider of an ATG network for IFC for business aviation, and therefore has had a monopoly on that market. (Stone Decl. ¶ 13; Cook Decl. ¶ 8.) In 2020, Gogo divested its commercial aviation ("CA") Ku-band satellite-based division for $400 million to IntelSat, leaving Gogo with its high-margin, cash-flow-positive BA division. (Cook Decl. ¶ 8.) Gogo has a monopoly in this space based on its exclusive license to the only nationwide broadband radio-frequency spectrum dedicated to ATG use in the U.S. and Canada, which ensures that others cannot interfere with Gogo's radio signal in that licensed spectrum. (Stone Decl. ¶ 9.)

However, Gogo's license provides it with only 4 MHz of spectrum, of which Gogo only uses 3 MHz. With data usage rates on business aircraft increasing about 38% per year since 2016, Gogo has acknowledged for many years that its limited licensed spectrum is inadequate to provide the bandwidth, speed, and performance customers demand and thus puts it at significant financial and competitive risk. (Cook Decl. ¶ 9). Despite facing this bandwidth shortage for years, Gogo did *not* turn to the abundant capacity of unlicensed spectrum. Instead, Gogo vigorously

lobbied the Federal Communications Commission ("FCC") to auction additional licensed spectrum for ATG communications. Ultimately, Gogo purchased only 1 MHz of additional spectrum for approximately $10 million in 2013. (*Id*. at ¶ 16.)

C. Unable to Improve Its ATG Network, Gogo Unlawfully Copied SmartSky's ATG Network Technology

After years of desperately trying to acquire more licensed spectrum – and with knowledge of SmartSky's patented breakthrough technology – in 2016 Gogo abruptly changed course and copied SmartSky's approach of using beamforming in the unlicensed spectrum. (Complaint at ¶ 29.) On the same day in 2016 that SmartSky received FCC certification for its ATG network using 60 MHz of unlicensed spectrum, Gogo announced that it also intended to use the same unlicensed spectrum for its next generation ATG network. Today, Gogo markets this infringing system as its "5G" network. (Complaint at ¶ 29.)

In the latter-half of October 2021, Gogo announced that it had sold its 5G system to an initial customer, which SmartSky asserts is infringing SmartSky's Asserted Patents. (Stone Decl. ¶ 38.) Gogo currently is marketing and offering to sell its 5G system, and expects to complete deployment nationwide in the second half of this year. Like SmartSky, Gogo expects its 5G system to be a greater than *ten-fold improvement* in capacity and speed over Gogo's current 3G/4G system. (Stone Decl. ¶ 34; Cook Decl. ¶ 20.)

IV. ARGUMENT

In patent cases, a court "may grant injunctions in accordance with the principles of equity to pre vent the violation of any right secured by patent, on such terms as the court deems reasonable." 35 U.S.C. § 283. To obtain a preliminary injunction, the moving party has the burden of showing four elements: (1) it is likely to succeed on the merits; (2) it is likely to suffer irreparable harm if the injunction is not granted; (3) the balance of equities between the parties tips in its favor;

and (4) an injunction is in the public interest. *See Winter v. Natural Res. Def. Council, Inc*., 555 U.S. 7, 20 (2008); *Tinnus Enters., LLC v. Telebrands Corp*., 846 F.3d 1190, 1202 (Fed. Cir. 2017).

A. SmartSky is Likely to Succeed on the Merits of Infringement and Validity

To demonstrate a likelihood of success on the merits, a patentee must demonstrate that it will likely prove infringement of one or more claims of the patents-in-suit, and that at least one of those allegedly infringed claims will likely withstand validity challenges, if any, presented by the accused infringer. *See Tinnus*, F.3d at 1202.

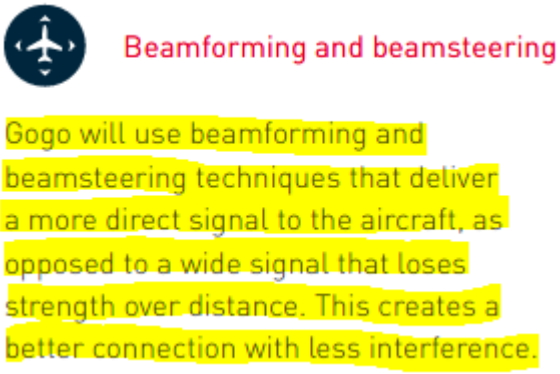
1. Gogo's 5G Network Infringes Multiple Claims of the Asserted Patents

Gogo's publicly available documents demonstrate that the Gogo 5G network infringes each of the asserted claims. The declaration of Dr. Steven Goldberg, an expert with decades of experience in designing and using wireless communication systems, including air-to-ground systems, sets forth an element-by-element analysis of Gogo's infringement. (Goldberg Decl. ¶¶ 3-14, 93-149).

a. The '947 and '417 Patents

Claims 1 and 11 of the '947 Patent are respectively directed to a network base station and a network having a plurality of network base stations, with each of the base stations including "a radio configured via software defined radio to utilize beamforming to generate a plurality of steerable beams, to enable multiple reuses of a same frequency to communicate with respective different in-flight communication nodes via respective different communication links." Gogo engineers have explained that Gogo 5G base stations include a "software-defined radio," ("SDR") which "tak[es] hardware and run[s] it on containerized solutions on common server hardware…[i.e.,] we take the guts of a physical component and now we're going to run it on a container on a server." (Goldberg Decl. ¶ 97). Gogo's 5G network uses the SDR to conduct

beamforming to form multiple steerable beams to communicate with multiple aircraft using the same frequency. *See id*. ¶¶ 98-101; Corbett Decl. Ex. 34 at 9):



The different communication links provided by Gogo's 5G network are high speed links that are "maintained continuous and uninterrupted" while the aircraft transitions between steerable beams of different base stations having overlapping coverage areas. For example, Gogo's 5G system conducts "make before break" handoffs, which allow for uninterrupted connectivity to passengers. (Goldberg Decl. ¶¶ 102-103.) Therefore, there is a strong likelihood that Gogo's 5G network infringes at least claims 1 and 11 of the '947 Patent.

Claims 1 and 11 of the '417 Patent include many of the same features discussed above for claims 1 and 11 of the '947 Patent, such as a software-defined radio and beamforming to generate at least one steerable beam, and Gogo's 5G network meets these limitations for the same reasons discussed and explained by Dr. Goldberg. (*Id*. ¶¶ 107, 109, 111-12). The Gogo 5G network also includes an antenna, and the Gogo 5G SDR employs a wireless radio access network protocol operating in a communication band from about 2 GHz to about 6 GHz, as recited in claims 1 and 11 of the '417 Patent. (*Id*. ¶¶ 108, 110). Gogo's 5G base station antennas are manufactured by Gogo's partner, Airspan Networks, and are "massive MIMO antenna arrays that use digital beamforming and advanced tracking algorithms." (*Id*. ¶¶ 98-100.) Gogo's 5G network will also

"use unlicensed spectrum in the 2.4 GHz range." (*Id*. ¶110.) Thus, there is a strong likelihood SmartSky will be able to establish that Gogo infringes claims 1 and 11 of the '417 Patent.[2]

b. The '717 and '077 Patents

Claims 1 and 12 of the '717 Patent and claims 1 and 2 of the '077 Patent are directed to ATG networks having multiple base stations, and specify that the base stations include antenna arrays defining directional radiation patterns that are oriented, or focus energy, toward the horizon. Gogo locates its base stations, each of which includes antenna arrays, at elevated positions so the base stations can "see the horizon." (*Id.* ¶¶ 125-127.) Moreover, Gogo locates its base stations "away from an urban environment" and notes that the antennas "transmit back over the urban environment," or toward the horizon. (*Id* ¶¶ 125, 141-142.) Photos of Gogo's 5G panel antenna arrays also show the face of the panel antenna array oriented toward the horizon, indicating that the main lobes of the radiation pattern are oriented toward the horizon. (*Id*. ¶¶ 126-127.) Dr. Goldberg further explains that Gogo's 5G network meets the additional elements of asserted '717 patent claims by having a base station that employs unlicensed spectrum in the 2.4 GHz band, and another base station that employs licensed spectrum in the 850 MHz band. (*Id*. ¶¶ 130-131.) Dr. Goldberg also explains that the Gogo 5G network meets the remaining elements of the asserted '717 Patent claims regarding the base stations communicating with a radio on an aircraft flying through respective cell coverage areas, and handing over communication as the aircraft moves between coverage areas. (*Id*. ¶¶ 132-33.)

Regarding other elements of the asserted '077 Patent claims, Dr. Goldberg explains that Gogo's 5G base stations define overlapping coverage areas to allow communication with in-

[2] SmartSky also alleges that Gogo's 5G network infringes claims 2, 5, 8, 12, 15, and 18 of the '417 Patent, but to simplify for purposes of this Motion, only address independent claims 1 and 11 of the '417 Patent.

flight aircraft in an ATG layer between a first altitude (10,000 feet) and a second altitude (35,000-40,000 feet). (*Id*. ¶¶ 144-45.) The Gogo 5G network enables communication in the ATG layer above a terrestrial communication network of terrestrial base station (e.g., Wi-Fi) that exist below the first altitude (10,000 feet). (*Id*. ¶ 146.) Also, Gogo's 5G base stations communicate in the ATG layer using the same RF spectrum (e.g., 2.4 GHz) that is used by the terrestrial base stations (e.g., Wi-Fi). (*Id*. ¶ 147.)

2. The Asserted Patents Are Valid

"Every patent is presumed valid, so if [the accused infringer] fails to identify any persuasive evidence of invalidity, the very existence of the patent satisfies [the patentee's] burden on validity." *Purdue Pharma L.P. v. Boehringer Ingelheim GmbH*, 237 F.3d 1359, 1365 (Fed. Cir. 2001); *Tinnus*, F.3d at 1202. This presumption of validity is constant throughout all stages of litigation, including preliminary injunction proceedings. To overcome it, the accused infringer must establish a "substantial question" regarding validity by presenting an invalidity defense that the patentee cannot show "lacks substantial merit." *Id*. at 1377.

In addition to the presumed validity of the Asserted Patents, the evidence shows that Gogo will be unlikely to establish a substantial question of validity regarding any of the Asserted Patents. Gogo unsuccessfully challenged the validity of the '947 Patent claims in an *inter partes* review petition that the Patent Trial & Appeal Board (PTAB) declined to institute, which indicates a strong likelihood of success regarding validity. *Bettcher Indus., Inc. v. Bunzl USA, Inc.*, 692 F. Supp. 2d 805, 820 (N.D. Ohio 2010) (noting patent's ultimate survival in a reexamination without being amended showed a likelihood of prevailing on validity); *Automotive Products plc v. Federal-Mogul Corp.*, 11 U.S.P.Q.2d 1471, 1473 (E.D. Mich. 1989) (finding likelihood of success regarding validity where patent survived defendant's prior art challenge in

reexamination proceeding). Regarding the '417, '077, '717 patent claims directed to an ATG network using unlicensed spectrum, skepticism of others in the ATG industry, long-felt but unmet need for additional bandwidth, copying by Gogo, and praise of the SmartSky ATG network performance all highlight the inventiveness of the Asserted Patents.

B. SmartSky Will Likely be Irreparably Harmed Absent a Preliminary Injunction

A party seeking a preliminary injunction must make a "clear showing" that it is likely to suffer irreparable harm in the absence of preliminary relief. *Winter*, 555 U.S. at 22; *Trebro Mfg. Inc. v. FireFly Equip., LLC*, 748 F.3d 1159, 1165 (Fed. Cir. 2014). "[T]o satisfy the irreparable harm factor in a patent infringement suit, a patentee must establish both of the following requirements: (1) that absent an injunction, it will suffer irreparable harm, and (2) that a sufficiently strong causal nexus relates the alleged harm to the alleged infringement." *Apple, Inc. v. Samsung Elecs., Co.*, 695 F.3d 1370, 1374 (Fed. Cir. 20012) ("Apple II").[3]

Harm is likely irreparable where, as here, the patentee and infringer are direct competitors because the patentee is forced to compete against its own invention. *See Trebro*, 748 F.3d at 1171; *Douglas Dynamics, LLC v. Buyers Prods.* Co., 717 F.3d 1336, 1345 (Fed. Cir. 2013). "Indeed, the principal value of a patent is the right to exclude arch competitors from making, selling and using an infringing product." *Butamax Advanced Biofuels LLC v. Gevo, Inc.*, 868 F. Supp. 2d 359, 374 (D. Del. 2012).

In this case, nearly all classic irreparable harm factors are present: lost sales, price erosion, lost market share, loss of R&D investment, and damage to reputation and goodwill as an innovator. There is no question that SmartSky's patented ATG network – for which it spent

[3] *Apple, Inc. v. Samsung Elecs., Co.*, 678 F.3d 1314, 1325 (Fed. Cir. 20012) ("Apple I").

[redacted] inventing and developing – is its flagship system. *See Douglas Dynamics*, F.3d at 1344; *Nevro Corp. v. Stimwave Techs., Inc*., 2019 WL 3322368, at *14 (D. Del. July 24, 2019). SmartSky has never licensed its patented technology, and it publicizes in nearly all of its marketing materials and press releases the fact that its ATG network is patented. *Nevro*, 2019 WL 3322368 at *14. And SmartSky is now entering the market for the first time and therefore is in its growth stage. *See Celsis in Vitro, Inc. v. Cellzdirect, Inc*., 664 F.3d 922, 930-31 (Fed. Cir. 2012) (patentee's flagship product in crucial growth stage supports finding of irreparable harm). In addition, Gogo's position for years as the only ATG provider in the niche BA IFC market allowed Gogo to have longstanding customer relationships, which contributes to SmartSky's irreparable harm. As explained below and in the declaration of Bryce Cook explains why SmartSky cannot be fully compensated for the harm caused by Gogo's unlawful infringement.

1. Gogo's Launch of its Infringing ATG Network Will Likely Cause SmartSky to Lose Sales

Without an injunction, Gogo will be able to compete on a better footing than if it were still selling a network service limited to only 3 MHz of licensed spectrum. Gogo is attacking SmartSky's status as the exclusive provider of breakthrough technology with greatly improved IFC for BA customers. The parties are the only two ATG providers in the market. (Cook Decl. ¶¶ 12, 22.) Therefore, SmartSky will lose sales and profits to Gogo that it otherwise would have gotten but for Gogo's infringement. (Cook Decl. ¶¶ 40.)

A significant portion – perhaps the majority – of lost revenue and profits cannot be quantified with reasonable certainty, thus resulting in irreparable economic harm to SmartSky even if a permanent injunction is granted. (Cook Decl. ¶¶ 42-45.) The reason for the indeterminacy has to do with the nature and length of the product revenue streams.

Also, lost service revenue cannot be estimated with reasonable certainty due to the phenomenon of customer "stickiness" and longevity, which Gogo states is almost *two full decades* (17 years). (Cook Decl. ¶¶ 43-45.) Thus, it is not possible to determine which customers would remain with Gogo, or for how long, before switching to SmartSky, to be able to determine the amount of continuing lost sales and lost profits damages. *See Celsis in Vitro, Inc. v. Cellzdirect, Inc*., 664 F.3d 922, 930 (Fed. Cir. 2012).

2. SmartSky Will Likely Suffer Irreparable Price Erosion

Federal courts have routinely held that price erosion is irreparable harm. *See, e.g., Abbott Labs. v. Sandoz, Inc*., 544 F.3d 1341, 1362 (Fed. Cir. 2008) (affirming irreparable harm due to price erosion); *Edwards Life Sciences AG v. CoreValve, Inc*., C.A. No. 08-91 (GMS), 2014 WL 1493187, at *6 (D. Del. Apr. 15, 2014) (likelihood of price erosion established irreparable harm). As here, price erosion is difficult to measure, is impossible to reverse, and cannot be remedied with money damages. *See Abbott Labs*., 544 F.3d at 1362 ("erosion of markets, customers, and prices, is rarely reversible").[4]

Without Gogo's infringing use of SmartSky's technology, SmartSky would be able to charge significantly higher prices for its ATG service than it is now if it did not have to compete with its own technology that Gogo unlawfully incorporated into its 5G network. (Cook Decl. ¶ 55; (Stone Decl. ¶¶ 46-47.) SmartSky is charging less than Gogo and hence is suffering price erosion on any sales that it makes while Gogo is in the market promoting and selling its infringing 5G service. Price erosion on current sales cannot be quantified with as damages with reasonable certainty, and, therefore, constitutes irreparable harm. (Cook Decl. ¶ 55.)

[4] *Albany Molecular Research, Inc. v. Dr. Reddy's Labs., Ltd*., No. 09-4638, 2010 WL 2516465, at *11 (D.N.J. Jun. 14, 2010) (rejecting argument that price erosion is compensable with money).

3. SmartSky will Likely Lose Market Share

Losing market share to a head-to-head competitor is a form of irreparable harm. *See TEK Glob, S.R.L. v. Sealant Sys. Int'l, Inc*., 920 F.3d 777, 792 (Fed. Cir. 2019); *Broadcom Corp. v. Emulex Corp*., 732 F.3d 1325, 1338 (Fed. Cir. 2013). Lost market share is irreparable because "[t]here is no effective way to measure the loss of sales or potential growth – to ascertain the people who do not knock on the door or to identify the specific persons who do not reorder because of the existence of the infringer." *Celsis*, 664 F.3d at 930; Cook Decl. ¶¶ 56-57.

SmartSky's potential market share and market position would be irreparably damaged without a preliminary injunction. With its breakthrough technology, SmartSky is a classic disruptor of a market that Gogo has monopolized for more than a decade. (Cook Decl. ¶¶ 56-57.) Gogo's customers had no other ATG option, and potential IFC providers have faced high barriers to entry. (Cook Decl. ¶¶ 56-57.) But SmartSky's willingness to invest more than [redacted] over a ten-year period to develop its patented technology has enabled it to enter the market with a service far superior to Gogo's 3G and 4G-branded services. (Cook Decl. ¶ 56.) *Nevro*, 2019 WL 3322368, at *13-14. As a disruptor, SmartSky has a strong chance to win the majority of the 70% of the BA market that has yet to install broadband connectivity, plus win some portion of Gogo's existing customer base looking to upgrade, and thus become the eventual market leader. (Cook Decl. ¶¶ 56.)

With Gogo touting SmartSky's patented features as the reason Gogo's infringing 5G network will have a similar or higher level of performance compared to SmartSky's ATG service, Gogo will be able to severely limit SmartSky's market expansion, diminishing SmartSky's market share and position for years to come. (Cook Decl. ¶¶ 34, 57.) Such a loss cannot be quantified by lost profits damages. *Id*. Just by virtue of Gogo's announced intention to launch its infringing ATG service, it is impeding SmartSky's ability to sign customers and gain market share.

due to the 17-year nature of customer relationships, Gogo's infringement will have a negative impact on SmartSky for many years into the future. *Id*.; *Nevro*, 2019 WL 3322368, at *14.

4. Gogo's Infringement Will Likely Cause Lost R&D

Federal courts consistently find that lost R&D investments constitute irreparable harm. *See, e.g., Vanda Pharm., Inc. v. Roxane Labs., Inc*., 203 F. Supp. 3d 412, 436 (D. Del. 2016) (lost R&D is irreparable harm); *Jannsen Prods., LP, v. Lupin Ltd*., 109 F. Supp. 650, 704 (D.N.J. 2014).

SmartSky has spent over 10 years and [redacted] developing its proprietary ATG network technology. (Stone Decl. ¶ 54.) It also has spent about [redacted] building out its ATG network in order to enter the IFC market. (Stone Decl. ¶ 54.) By losing its exclusivity and competitive superiority in the IFC market, it will not be able to recover its R&D investment and capital expenditures to the extent it expected. (Cook Decl. ¶ 58.) *See Nevro*, 2019 WL 3322368 at *14 (finding irreparable harm where patentee "spent hundreds of millions of dollars to bring its [patented product] to market and support it" and "all of [its] research and development is directed towards" its patented product). Also, by taking SmartSky's market share and eroding its prices, Gogo will significantly impair SmartSky's ability to invest in future R&D. (Stone Decl. ¶ 54.)

5. Gogo's Infringement Likely Will Harm SmartSky's Goodwill and Reputation as an Innovator

A patentee's "reputation as an innovator will certainly be damaged if customers found the same 'innovations' appearing in competitors' [products]." *Douglas Dynamics, LLC v. Buyers Prods. Co*., 717 F.3d 1336, 144-45 (Fed. Cir. 2013).[5] SmartSky spent more than ten years building its reputation and goodwill as an innovator and inventor of its patented, breakthrough

[5] *Tinnus Enters*., 846 F.3d at 1208 ("persisting harm to [patentee]'s reputation and tarnishes its status as the innovator in the market"); *Celsis*, 664 F.3d at 930.

technology. (Stone Decl. ¶ 54.) SmartSky's technology has garnered positive attention from investors and the aviation industry who have long awaited an IFC service that offers broadband connectivity similar to that found on the ground. (Cook Decl. ¶ 59.) Because of these technologies and the publicity surrounding them, SmartSky has been able to raise more than [redacted] in capital from investors who expect SmartSky to make significant gains in the IFC BA market. (Cook Decl. ¶ 59; Stone Decl. ¶¶ 31, 50.) The importance of SmartSky's patented technology cannot be overstated, and is why SmartSky has not offered to license its patents. (Stone Decl. ¶ 61.) It is only through these patented technologies that SmartSky has an ATG network with which to enter the IFC BA market. (Cook Decl. ¶ 59.) SmartSky's earned reputation and goodwill will suffer permanent and irreparable damage from Gogo's infringement. (Cook Decl. ¶¶ 59-60.)

6. Gogo's Infringement and Monopolist Position in the Niche IFC Market Likely Will Harm SmartSky

The market for providing IFC services on private and regional jets is a relatively small, niche market. (Cook Decl. ¶¶ 63, 64.) There are a small number of OEMs, MROs/dealers, value-added resellers, airlines, management companies, fractional fleets, and corporate fleets that either directly make or strongly influence the IFC purchase decisions on the majority of BA and regional jet aircraft in North America. (Cook Decl. ¶¶ 63, 64; Stone Decl. ¶¶ 58, 59.) Because of Gogo's relationship with many of these entities, the anticipation of Gogo 5G is preventing or delaying these entities from working on supplemental type certificates for SmartSky, thus harming SmartSky's ability to compete. *Id*. Thus, the more time Gogo has to promote and sell its infringing product before being enjoined, the more SmartSky will lose in market penetration and market share. *Rare Breed Triggers, LLC v. Big Daddy Ent's., Inc*., No. 1: 21-CV-149, Slip Op. at 9 (N.D. Fla. Dec. 30, 2021) (finding irreparable harm in two-competitor, niche market).

7. Gogo's Infringement is Causing the Irreparable Harm to SmartSky

One way of demonstrating the required nexus between alleged patent infringement and irreparable harm is to show that the patented features at least partially drive consumer demand. *See Nevro*, 2019 WL 3322368 at *15. Here, SmartSky's patented features relating to beamforming, reusing spectrum, seamless handoffs, increased capacity from using unlicensed spectrum, and horizon-oriented antenna patterns drive consumer demand for ATG systems.

Consumers are increasingly demanding the ability to use high-bandwidth applications such as videoconferencing, which requires not just additional bandwidth, but increased speed in both upload and download directions, as well as reduced latency and interference. (Cook Decl. ¶¶ 13, 14, 25, 29-32.) Gogo itself acknowledges that consumers are demanding the ability to use such applications while in flight. (*Id*. ¶ 29.) And industry experts agree. (Cook Decl. ¶¶ 37-38.) The ability to meet these consumer demands is made possible by SmartSky's patented features. Use of beamforming, which is recited in the asserted '947 and '417 Patent claims, allows base stations to allocate a single beam to a single aircraft, which allows users on the aircraft to enjoy data rates that can accommodate high-bandwidth applications without having to share signal with users on another plane. (Goldberg Decl. ¶¶ 84-85.) In addition, the base stations can generate multiple beams that reuse the same spectrum without interfering with each other. (*Id*. ¶ 84-85.) And the unlicensed spectrum opens up 60 MHz of bandwidth, which is *20 times larger* than Gogo's current operating bandwidth, as Gogo's own marketing documents explain. (Cook Decl. ¶¶ 19, 33.)

Moreover, the use of seamless handoffs between beams of different base stations allows consumers to maintain their videoconference regardless of which beam or base station is enabling the communication link. (Goldberg Decl. ¶ 83.) Gogo again cites the "uninterrupted

connectivity" of its 5G network in its marketing materials. (Cook Decl. ¶¶ 31-32; Goldberg Decl. ¶¶ 102-103.)

C. The Balance of Equities Strongly Weighs in Favor of Protecting SmartSky's Breakthrough Technology

In considering the balance of equities, the Court must weigh the harm to the moving party without an injunction against the harm to the non-moving party with an injunction. *See Winter*, 555 U.S. at 20. Without an injunction, SmartSky will be forced "to compete against its own patented invention, with the resultant harms described above, [which] places a substantial hardship on [SmartSky]." *Robert Bosch*, 659 F.3d at 1156. SmartSky's business is based on its ability to exclusively provide to business aviation an "office in the sky" in-flight connectivity using its patented technology. In its launch phase, with customers deciding between SmartSky's network and Gogo's infringing 5G network, SmartSky cannot afford to lose the exclusivity of its patented technology, particularly to its only competitor, whose infringement is preventing SmartSky from effectively penetrating its only market and eroding prices. (Stone Decl. ¶ 61.) *See Celsis*, F.3d at 931; *TEK*, 2019 WL 1312538, at *12 (affirming finding of harm as patentee's "lack of diversification exposes it to a particular risk of lowered market share"); *Nevro*, 2019 WL 3322368 at *13-14 (finding irreparable harm where patentee's only products related to its patented system). In stark contrast, Gogo has enjoyed a monopoly position and is in a far superior financial position, having operated its exclusive nationwide ATG network for about two decades, and recently posting record quarterly revenue of over [redacted] and record quarterly profit of nearly [redacted] in 3Q 2021. Further, Gogo recently received $400 million in cash for the sale of its commercial aviation business. SmartSky is not seeking to prevent Gogo from generating revenue by offering and operating its current 3G/4G ATG network. Rather, SmartSky is simply seeking to maintain the status quo.

Also, to the extent Gogo argues it will experience any harm from a preliminary injunction, such harm is of its own making. Gogo has been well aware of SmartSky's patents and breakthrough technology for years. Indeed, two years ago, Gogo voluntarily filed an IPR Petition with the PTAB challenging – unsuccessfully – the validity of SmartSky's '947 patent asserted in this case. Rather than innovating on its own, Gogo made the decision to willfully infringe SmartSky's patented technology. So any hardship for Gogo would be "the result of its own calculated risk in selling a product with knowledge of [SmartSky's] patent[s]." *Celsis*, 664 F.3d at 931; *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1003 n.12 (Fed. Cir. 1986) ("One who elects to build a business on a product found to infringe cannot be heard to complain if an injunction against continuing infringement destroys the business so elected."); *Technical Sols. Holdings, Inc. v. Laird Techs., Inc.*, C.A. No. 14-181-LPS, 2014 WL 2727198, at *7 (D. Del. June 13, 2014) (granting preliminary injunction and indicating willfulness might be "an important factor" in balancing harms).

D. The Public Interest Will Be Served by a Preliminary Injunction

Federal courts "have long acknowledged the importance of the patent system in encouraging innovation." *Sanofi-Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1383 (Fed. Cir. 2006). Over eleven years, SmartSky has spent over [redacted] in R&D and development costs in inventing its technology, and another [redacted] building out and bringing to market its vastly superior nationwide ATG Network. (Stone Decl. ¶ 54.) SmartSky's significant investment was incentivized by the exclusive patent rights, and SmartSky should be able to rely on that exclusivity to recoup its investment. SmartSky is just now entering the market and has not yet turned a profit. So the next two years will be critical to SmartSky's ability to penetrate the market and reap the fruits of its investment. (Stone Decl. ¶¶ 32-35.) As the Federal Circuit has recognized, SmartSky's investment "must be encouraged and protected by the exclusionary rights conveyed in valid

patents." *Celsis*, 664 F.3d at 931. Simply put, companies will be significantly discouraged from making investments in ATG networks and IFC technologies, or many other critical technologies, if the patent system fails to protect investments like SmartSky's. *Id*.

Moreover, there will be no disservice to the public interest by enjoining Gogo's willful infringement. Gogo only recently began offering to sell its 5G network, and SmartSky's vastly improved technology will soon be available nationwide. (Stone Decl. ¶ 30.) SmartSky's request for injunctive relief is narrowly tailored to Gogo's infringing 5G system. The injunction would not prevent Gogo from continuing to operate and sell its current 3G/4G offering or investing in non-infringing technologies. *See Nevro*, 2019 WL 3322368 at *16. For those customers who desire higher performance for IFC, they will have access to SmartSky's ATG system. *See Celsis*, F.3d at 932.

V. CONCLUSION

For the reasons explained above, SmartSky requests that Gogo be preliminarily enjoined from making, using, offering to sell, or selling its infringing 5G system.

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