

# Exhibit 1

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
WASHINGTON, D.C. 20436**

**In the Matter of**

**CERTAIN NOISE CANCELLING  
HEADPHONES AND COMPONENTS  
THEREOF**

**Investigation No. 337-TA-\_\_\_\_\_**

**COMPLAINT OF BOSE CORPORATION  
UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED**

**COMPLAINANT**

Bose Corporation  
The Mountain Road  
Framingham, MA 01701  
Tel: (508) 879-7330

**COUNSEL FOR COMPLAINANT:**

Charles H. Sanders  
Suhrid A. Wadekar  
M. Frank Bednarz  
GOODWIN PROCTER LLP  
Exchange Place  
53 State Street  
Boston, MA 02109-2802  
Tel: (617) 570-1000  
Fax: (617) 523-1231

Kecia J. Reynolds  
GOODWIN PROCTER LLP  
901 New York Avenue, N.W.  
Washington, DC 20001-4332  
Tel: (202) 346-4000  
Fax: (202) 346-4444

**PROPOSED RESPONDENTS**

Beats Electronics, LLC  
8600 Hayden Place  
Culver City, CA 90232  
Tel: (424) 326-4679

Beats Electronics International Ltd.  
The Malt House South  
Grand Canal Quay  
Dublin 2  
Ireland  
Tel: +353 1800 946 531

Fugang Electronic (Dong Guan) Co., Ltd.  
Industry Street, Dong-Keng, Dong-Guan,  
Guang-Dong  
China  
Tel: +86 769 8388 2225

PCH International Ltd.  
Heritage Business Park  
Bessboro Road, Blackrock  
Cork  
Ireland  
Tel: +353 21 733 7400

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## LIST OF EXHIBITS

<b>Exhibit No.</b>	<b>Description</b>
1	Certified Copy of U.S. Patent No. 6,717,537 (“the ’537 patent”)
2	Certified Copy of U.S. Patent No. 8,073,150 (“the ’150 patent”)
3	Certified Copy of U.S. Patent No. 8,073,151 (“the ’151 patent”)
4	Certified Copy of U.S. Patent No. 8,054,992 (“the ’992 patent”)
5	Certified Copy of U.S. Patent No. 8,345,888 (“the ’888 patent”)
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22	Foxlink web page, China Locations – Fugang Electronic (Dong Guan) Co., Ltd
23	English-language version of Cheng Uei Consolidated, Co., Ltd. Financial Statement

<b>Exhibit No.</b>	<b>Description</b>
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<b>Exhibit No.</b>	<b>Description</b>
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53	Bose web page, “QuietComfort® 20i Acoustic Noise Cancelling® headphones”
54	Bose web page, “QuietComfort® 15 Acoustic Noise Cancelling® headphones”

**LIST OF PHYSICAL EXHIBITS**

<b>Physical Exhibit No.</b>	<b>Description</b>
P1	Beats Studio® headphones
P2	Beats Studio® Wireless headphones
P3	Bose® QuietComfort® 20 headphones
P4	Bose® QuietComfort® 20i headphones



## LIST OF APPENDICES

<b>Appendix</b>	<b>Description</b>
A	Prosecution History of U.S. Patent No. 6,717,537
B	Prosecution History of U.S. Patent No. 8,073,150
C	Prosecution History of U.S. Patent No. 8,073,151
D	Prosecution History of U.S. Patent No. 8,054,992
E	Prosecution History of U.S. Patent No. 8,345,888
F	Technical references cited in Prosecution History for U.S. Patent No. 6,717,537
G	Technical references cited in Prosecution History for U.S. Patent No. 8,073,150
H	Technical references cited in Prosecution History for U.S. Patent No. 8,073,151
I	Technical references cited in Prosecution History for U.S. Patent No. 8,054,992
J	Technical references cited in Prosecution History for U.S. Patent No. 8,345,888

## I. INTRODUCTION

1.1 Bose Corporation (“Bose” or “Complainant”) requests that the United States International Trade Commission commence an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 (“Section 337”), to remedy the unlawful importation into the United States, sale for importation into the United States, and/or sale within the United States after importation by the owner, importer, consignee, or entities having a nexus to importation, of certain noise cancelling headphones and components thereof (collectively referred to as the “Accused Products”), which include Beats Studio® and Beats Studio® Wireless headphones, that infringe one or more valid and enforceable United States patents owned by Bose.

1.2 Bose designs, develops, and sells a variety of high-quality audio products, including noise cancelling headphones that actively cancel out background noise to deliver excellent audio renditions of music and other recordings. As used herein, “headphones” may also be referred to as, for example, “earpieces,” “earphones,” “headsets,” “earbuds,” or “sport headphones.”

1.3 Bose’s noise cancelling headphones are protected by numerous patents. Bose’s latest noise cancelling headphones model, the QC20, is protected by at least 27 U.S. patents and applications (14 patents and 13 pending applications). Among the patents covering Bose’s QC20 headphones are U.S. Patent Nos. 6,717,537; 8,073,150; 8,073,151; 8,054,992; and 8,345,888 (respectively, the “537 patent,” “150 patent,” “151 patent,” “992 patent,” and “888 patent,” or collectively the “Asserted Patents”). *See Exhibits 1-5*. The Asserted Patents are valid and enforceable United States Patents and Bose owns by assignment the entire right, title, and interest in them.

1.4 Based on the facts set forth in the Declaration of Sean Garrett, an industry exists and/or is in the process of being established in the United States relating to articles protected by the Asserted Patents, as required by Section 337(a)(2) and defined by Section 337(a)(3). *See Exhibit 42C.*

1.5 This Complaint is based on the proposed Respondents’ unlawful and unauthorized importation into the United States, sale for importation, and/or sale within the United States after importation, of certain noise cancelling headphones and components thereof. Proposed Respondents’ products, specifically including Beats Studio® and Studio® Wireless headphones, infringe one or more claims of the Asserted Patents.

1.6 The proposed Respondents (hereinafter “Respondents”) are:

- (1) Beats Electronics, LLC (“BEL”) and Beats Electronics International Limited (“BEI”) (collectively “Beats”);
- (2) Fugang Electronic (Dong Guan) Co., Ltd. (“Fugang”); and
- (3) PCH International Ltd. (“PCH”).

1.7 Bose asserts that the Respondents directly infringe, contributorily infringe, and/or induce the infringement of at least the claims of the Asserted Patents identified below (collectively, “the Asserted Claims”):

<b>No.</b>	<b>U.S. Patent</b>	<b>Inventor(s)</b>	<b>Asserted Claims</b>
1	6,717,537	Xiaoling Fang, Keith L. Davis, and Martin R. Johnson	1-3, 5-7, 9-12, 14-16, and 18-19 (independent claims 1, 10, and 19)
2	8,073,150	Marcel Joho and Ricardo Carreras	14 and 22-23 (independent claim 14)
3	8,073,151	Marcel Joho and Ricardo Carreras	14, 18, 23, and 25 (independent claim 14)
4	8,054,992	Roman Sapiejewski	1, 4, 6, 15-16, and 18 (independent claims 1, 15, and 18)

5	8,345,888	Ricardo Carreras, Daniel Gauger, Jr., and Steven Isabelle	1-2, 5-9, 11-14, and 16 (independent claims 1, 7, and 13)
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Further discovery may reveal that the Respondents infringe additional claims.

1.8 Respondents Beats, Fugang, and PCH have engaged in unlawful activities in violation of Section 337(a)(1)(B)(i) through and in connection with the unfair importation into the United States, the sale for importation, and/or the sale within the United States after importation of certain noise cancelling headphones and components thereof, which infringe one or more claims of the valid and enforceable Asserted Patents.

1.9 Bose seeks relief from the Commission in the form of a permanent limited exclusion order, pursuant to Section 337(d), excluding from entry into the United States products of the Respondents that infringe one or more claims of the Asserted Patents. Bose also seeks permanent cease and desist orders, pursuant to Section 337(f), halting the importation, sale, offer for sale, marketing, advertising, or solicitation of customers of certain noise cancelling headphones and components thereof, and other products by the Respondents and their related companies that infringe one or more of the Asserted Patents.

## **II. THE PARTIES**

### **A. Complainant**

2.1 Complainant Bose is a corporation organized and existing under the laws of the State of Delaware with a principal place of business at The Mountain Road, Framingham, Massachusetts 01701.

2.2 Since Bose was founded in 1964, Bose has designed and developed unique sound solutions for a host of audio applications, including home entertainment and home audio, aviation and automotive industries, and the military. Bose also designs professional sound

systems for many applications, including stadiums and auditoriums, houses of worship, retail businesses, department stores, and restaurants.

2.3 Bose develops, manufactures, and supports a wide range of products including automotive sound systems, professional audio systems, and personal audio equipment, such as headphones, tabletop systems, speaker systems, and home theater systems. Bose's product offerings extend beyond audio products and now include products such as the Bose® Ride® active seat for the commercial trucking industry. Additional Information about Bose is available on its website: <http://www.bose.com>.

2.4 In addition to its corporate headquarters, research & development, and engineering facilities in Massachusetts, Bose has operations in Michigan, Minnesota, Arizona, South Carolina, as well as international locations, and retail locations throughout the United States.

2.5 For almost 50 years, Bose has made significant investment in the research, development, engineering, and design of proprietary technologies now implemented in its products, such as noise cancelling headphones. Bose's current line of noise cancelling headphones, for example, embodies inventions protected by at least 36 U.S. patents and applications (22 patents and 14 pending applications). Bose has also made significant investments in plant and equipment, and employment of labor and capital, in the manufacture of noise cancelling headphones. Bose continually invests in research and development, leading to numerous patents, to ensure the singular performance of Bose headphones.

2.6 During a 1978 flight to Boston returning from Zurich, Dr. Amar Bose was trying out a new set of airline-supplied headphones and found that the experience was a great disappointment to him, as the fidelity benefits of the new headphones, compared to the older

pneumatic tube phones, were masked by significant audible cabin noise and by the distortion that resulted from increasing the headphone volume to overcome this noise. On that flight, Dr. Bose formulated the basic concept and technology for a headphone that would not only reproduce speech and music with high fidelity, but also simultaneously act to significantly reduce unwanted cabin noise.

2.7 Upon his return, Dr. Bose initiated a research program to work on this problem. Early research centered on building models to validate the concept and to allow study of the materials and transducers needed to make the system work. As knowledge increased, Bose engineers began to consider applications for the technology.

2.8 Over the next several years, a series of prototypes were built for the U.S. Air Force, the U.S. Army and, in 1986, for the experimental Voyager aircraft, in a privately sponsored, non-stop around-the-world flight. In 1989, Bose Corporation introduced the first commercially available active noise reduction headset. This product was designed for the aviation industry for communication in light aircraft and helicopters.

2.9 In 1991, the U.S. Air Force selected Bose Corporation to produce an Acoustic Noise Cancelling headset for flight helmets and, in 1993, the Combat Vehicle Crewman (CVC) headset went into production for the U.S. Army. The contract for the Performance Improved Combat Vehicle Crewman (PICVC) headset was renewed and these headsets are used by the U.S. Army on Abrams Tanks and Bradley Fighting Vehicles. U.S. Air Force pilots flying the C-130 and other aircraft also have been outfitted with Bose active noise reduction headsets. Product improvements were introduced in 1995 with the Acoustic Noise Cancelling® headset Series II, which was awarded “Product of the Year” by the Aircraft Owners and Pilots Association (AOPA). In 1998, the Bose Aviation Headset X™ was introduced, offering a

breakthrough in performance with Bose's proprietary TriPort® headphone structure. In 2004, Bose Corporation introduced the TriPort® Tactical Headset, which was employed by infantry soldiers operating military Humvees, cargo trucks, and other wheeled vehicles. In 2013, Bose Corporation introduced the T5 Tactical Headset, which allows dismounted soldiers to continue to have the benefits of Bose's technology while away from their vehicle, among other advances.

2.10 Bose Corporation has leveraged its research in military and commercial noise reduction for consumer applications. The QuietComfort® Acoustic Noise Cancelling headphones were first introduced in 2000. In 2003, Bose Corporation debuted the QuietComfort® 2 headphone to critical acclaim, offering an unprecedented combination of noise reduction, audio performance, and comfortable fit in a more convenient around-the-ear headphone. In 2006, the product line was extended with the invention of the QuietComfort® 3 headphones offering new technologies that deliver the same level of performance as its predecessor in a smaller, more portable on-ear design. In 2009, Bose introduced the QuietComfort® 15 headphones, which were widely considered to provide superior noise cancellation compared to any other consumer on-ear headphones currently available. In 2013, Bose introduced the QuietComfort® 20 and 20i headphones, which marked both the first in-ear Acoustic Noise Cancelling® headphone from Bose and the first mass-market use of digital technology in a Bose Acoustic Noise Cancelling® headphone.

2.11 The inventions covered by the Asserted Patents arose out of the inventors' recognition of the unique technical problems associated with constructing improved high-performance noise cancelling headphones.

2.12 To protect its investments, Bose has sought patent protection, and owns many patents and patent applications. Because Bose invests heavily in research and development, and

because Bose has built its reputation on producing superior products through innovative technology, Bose's continued success depends in substantial part on its ability to establish, maintain, and protect its proprietary technology through enforcement of its patent rights.

**B. Respondents**

**1. Beats Electronics, LLC and Beats Electronics International Limited (collectively "Beats")**

2.13 Upon information and belief, Beats Electronics, LLC ("BEL") is a Delaware company with its principal place of business at 8600 Hayden Place, Culver City, CA 90232.<sup>1</sup> See **Exhibits 12-13**. Upon information and belief, Respondent BEL directs manufacture and design of the Accused Products, which are imported into the United States by BEL, among others. See **Exhibit 17-18**. BEL further offers for sale and sells Accused Products in the United States after importation through its network of authorized dealers (*e.g.*, Best Buy, Staples, Fry's Electronics, Radio Shack, etc.), retail stores, its store in New York City, and through the company website. See **Exhibit 19-21**.

2.14 Beats Electronics International Limited ("BEI") is an Irish corporation with its registered office at The Malt House South, Grand Canal Quay, Dublin 2, Ireland. See **Exhibit 14** (BEI, Directors' report and financial statements). Upon information in belief, BEI is a subsidiary of BEL. See **Exhibit 15** (Directors' report and financial statements of BEI's direct parent corporation as of 2013). Upon information and belief, Respondent BEI imports the Accused Products into the United States and/or sells them for importation into the United States. See **Exhibit 16-18**. BEI and affiliated foreign entities "generate[] revenue principally through the wholesale distribution of headphones and audio products." **Exhibit 15**. BEI "commenced trading on 1 July 2012" and reported turnover of \$172,463,506 for the year ended December, 31

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<sup>1</sup> Beats appears to have recently re-located its principal place of business from 1601 Cloverfield Blvd., Suite 5000N Santa Monica, CA 90404, to the Culver City address.



2012. **Exhibit 14.** “Turnover recognised in the statement of comprehensive income consists solely of income from the wholesale distribution of headphones and other audio accessories.” *Id.*

2.15 Upon information and belief, together BEL and BEI (collectively “Beats”) are in the business of manufacturing, assembling, and/or packaging the Accused Products outside of the United States and/or importation of the Accused Products into the United States. Beats is engaged in the design and sale of consumer products including “premium consumer headphones, earphones, and speakers.” *See Exhibit 13* (Beats, About Us). Beats imports the Accused Products into the United States, sells them for importation into the United States, and/or sells them in the United States after importation. *See, e.g., Exhibit 16-18* (importation of Accused Products into the United States by Beats entities); **19-21** (sales and offers to sell after importation). Upon information and belief, Beats maintains commercially significant inventories of the Accused Products in the United States.

## **2. Fugang Electronic (Dong Guan) Co., Ltd. (“Fugang”)**

2.16 Upon information and belief, Fugang Electronic (Dong Guan) Co., Ltd. (“Fugang”) is a Chinese corporation with a principal place of business at Industry Street, Dong-Keng, Dong-Guan, Guang-Dong in China. *See Exhibit 22.* Fugang is indirectly and wholly owned by Cheng Uei Precision Industry Co., Ltd. (“Cheng Uei”), a publicly-traded Taiwanese corporation which conducts business under the name “Foxlink.” *See Exhibit 23* (English-language version of Cheng Uei Consolidated Financial Statement).

2.17 According to FCC filings, Fugang manufactures at least one of the Accused Products, the Beats Studio® Wireless, outside the United States. *See Exhibit 24.* The Beats Studio® Wireless manufactured by Fugang is a Beats-branded product and is intended for sale by Beats in the United States, as confirmed by the FCC report. On information and belief,

Fugang imports and/or sells for importation into the United States at least this Accused Product, which is then sold in the United States by Beats.

### **3. PCH International Limited (“PCH”)**

2.18 Upon information and belief, PCH International Limited (“PCH”) is a privately held Irish company with a head office at Heritage Business Park, Bessboro Road, Blackrock, Cork, Ireland. As of 2011, PCH was wholly owned by Amekab Limited, another privately held Irish corporation. *See Exhibit 27* (2011 consolidated financial statements of Amekab Limited). PCH “specialises in the supply of integrated supply chain services serving the consumer electronics, PC, medical, telecoms and other industries from its base of operations, belonging to an affiliate, in Shenzhen, China.” *Id.*

2.19 Upon information and belief, Respondent PCH imports Accused Products into the United States and/or sells them for importation into the United States. *See Exhibit 16-17* (showing shipment by PCH of Beats Studio® headphones and over 100 containers of “headphone” products to Beats).

### **III. THE TECHNOLOGY AND PRODUCTS AT ISSUE**

3.1 The technology at issue is active noise reduction (“ANR”), also known as active noise control. ANR is a technique to reduce unwanted noise by introducing a second sound source that destructively interferes with the unwanted noise. ANR headphones typically use at least one microphone to detect unwanted ambient noise, and the headphone speaker produces sound waves of reverse phase to destructively interfere with the unwanted sound.

3.2 Bose uses the ANR technologies at issue in its QuietComfort® 20 and QuietComfort® 20i Acoustic Noise Cancelling® headphones.

3.3 The Accused Products include, for example, Beats Studio® headphones, and Beats Studio® Wireless headphones, both of which employ a form of ANR. *See Exhibit 11.*

The Accused Products are imported into and sold within the United States by or on behalf of the Respondents. Through the discovery process, it may be revealed that additional products of Respondents also use ANR technology and should be included in this investigation.

**IV. THE ASSERTED PATENTS**

4.1 Bose asserts infringement of United States Patent Nos. 6,717,537; 8,073,150; 8,073,151; 8,054,992; and 8,345,888. The Asserted Claims are identified in the table below:

<b>No.</b>	<b>U.S. Patent</b>	<b>Inventor(s)</b>	<b>Asserted Claims</b>
1	6,717,537	Xiaoling Fang, Keith L. Davis, and Martin R. Johnson	1-3, 5-7, 9-12, 14-16, and 18-19 (independent claims 1, 10, and 19)
2	8,073,150	Marcel Joho and Ricardo Carreras	14 and 22-23 (independent claim 14)
3	8,073,151	Marcel Joho and Ricardo Carreras	14, 18, 23 and 25 (independent claim 14)
4	8,054,992	Roman Sapiejewski	1, 4, 6, 15-16, and 18 (independent claims 1, 15, and 18)
5	8,345,888	Ricardo Carreras, Daniel Gauger, Jr., and Steven Isabelle	1-2, 5-9, 11-14, and 16 (independent claims 1, 7, and 13)

**A. The '537 Patent**

**1. Identification of the Patent and Ownership by Bose**

4.2 Bose owns by assignment the entire right, title, and interest in the '537 patent entitled "Method and Apparatus for Minimizing Latency in Digital Signal Processing Systems," which issued on April 6, 2004. The '537 patent issued from U.S. Patent Application Serial No. 10/179,930, filed on June 24, 2002. This patent application claims priority to a provisional application, Serial No. 60/301,308, filed on June 26, 2001. The inventors of the '537 patent, Xiaoling Fang, Keith L. Davis, and Martin R. Johnson assigned to Sonic Innovations, Inc. ("Sonic"), all right, title, and interest in the invention disclosed and claimed in the '537 patent.

See **Exhibit 6**. Sonic subsequently assigned the '537 patent to Bose. *Id.* The '537 patent is valid, enforceable, and in full force and effect. A certified copy of the '537 patent is attached as **Exhibit 1**.

4.3 Pursuant to Commission Rule 210.12(c), this Complaint is accompanied by a copy of the prosecution history for the '537 patent and three additional copies of the prosecution history (**Appendix A**).<sup>2</sup> Four copies of each reference document mentioned in the prosecution history accompany this Complaint. See **Appendix F**.

## **2. Non-Technical Description of the Patented Invention<sup>3</sup>**

4.4 The '537 patent generally relates to apparatuses and methods for minimizing latency in a device which implements ANR using digital signal processing. This patented digital ANR technology minimizes latency, which permits the anti-noise signal to arrive very close in time to the ambient noise, and thereby achieves effective noise cancellation. This technology is discussed in more detail below.

4.5 An input signal, *e.g.*, a signal representing music from a portable music player, is processed into a digital input signal having an intermediate sampling rate. This input signal is transmitted along a forward path that includes at least a digital-to-analog converter and an output transducer, such as a speaker in an ear cup of a headphone for delivering audio to a user.

4.6 The system also has a feedback path including at least an input transducer (such as a microphone in an ear cup of a headphone for detecting ambient noise), a delta-sigma modulator (which is a component for converting the analog signal from the input transducer to a

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<sup>2</sup> Bose has ordered certified copies of the prosecution histories for the Asserted Patents pursuant to Commission Rules 210.8(a)(1)(i) and 210.12(c)(1), but has not yet received them. Uncertified prosecutions histories have been provided to the Commission. Bose will supplement its filing with certified copies of the prosecution histories upon receipt.

<sup>3</sup> All non-technical descriptions of the inventions herein are presented for general background purposes only. These descriptions are not intended to, and do not, construe either the specification or claims of any Asserted Patent.

digital signal), and a sampling-rate converter for down-converting the digital signal to the intermediate sampling rate. In either the forward path or the feedback path, there is a compensation filter for processing the digital signal representing the ambient noise into an anti-noise signal. This anti-noise signal and the processed digital input signal are converted to analog signals by the digital-to-analog converter and emitted as acoustic signals by the output transducer. The anti-noise and ambient noise signals cancel in the airspace in front of the output transducer, such as in the ear canal of a user.

## **B. The '150 Patent**

### **1. Identification of the Patent and Ownership by Bose**

4.7 Bose owns by assignment the entire right, title, and interest in the '150 patent entitled "Dynamically Configurable ANR Signal Processing Topology," which issued on December 6, 2011. The '150 patent issued from U.S. Patent Application Serial No. 12/430,990, filed on April 28, 2009. The inventors of the '150 patent, Marcel Joho and Ricardo Carreras, assigned to Bose all right, title, and interest in the invention disclosed and claimed in the '150 patent. *See Exhibit 7.* The '150 patent is valid, enforceable, and in full force and effect. A certified copy of the '150 patent is attached as **Exhibit 2**.

4.8 Pursuant to Commission Rule 210.12(c), this Complaint is accompanied by a copy of the prosecution history for the '150 patent and three additional copies of the prosecution history (**Appendix B**). Four copies of each reference document mentioned in the prosecution history accompany this Complaint. *See Appendix G.*

### **2. Non-Technical Description of the Patented Invention**

4.9 The '150 patent generally relates to a configurable ANR apparatus that can have different ANR settings. For example, one ANR setting may be used where a user of headphones

is simply seeking noise reduction, but is not listening to input audio, and another ANR setting may be used where a user is listening to input audio.

4.10 The circuit in this apparatus includes at least two pathways, for example a pathway for an input audio signal and a feedback ANR pathway. One pathway, for example the pathway for an input audio signal (*e.g.*, a signal representing music from a portable music player), includes an analog-to-digital converter, digital filters, and a digital-to-analog converter. The second pathway (*e.g.*, a pathway for detecting ambient noise such as the feedback ANR pathway) includes another digital-to-analog converter, digital filters, and the digital-to-analog converter. These pathways, and the digital filters, are configured using a program stored in memory as specified for a particular ANR setting. This ANR setting can be changed to a different ANR setting.

### **C. The '151 Patent**

#### **1. Identification of the Patent and Ownership by Bose**

4.11 Bose owns by assignment the entire right, title, and interest in the '151 patent entitled "Dynamically Configurable ANR Filter Block Technology," which issued on December 6, 2011. The '151 patent issued from U.S. Patent Application Serial No. 12/430,994, filed on April 28, 2009. The inventors of the '151 patent, Marcel Joho and Ricardo Carreras, assigned to Bose all right, title, and interest in the invention disclosed and claimed in the '151 patent. *See Exhibit 8.* The '151 patent is valid, enforceable, and in full force and effect. A certified copy of the '151 patent is attached as **Exhibit 3**.

4.12 Pursuant to Commission Rule 210.12(c), this Complaint is accompanied by a copy of the prosecution history for the '151 patent and three additional copies of the prosecution history (**Appendix C**). Four copies of each reference document mentioned in the prosecution history accompany this Complaint. *See Appendix H.*

## **2. Non-Technical Description of the Patented Invention**

4.13 The application for the '151 patent was filed the same day as the application for the '150 patent, and shares the same inventors. The disclosures of the two patents are substantially similar, describing an ANR circuitry for a configurable ANR apparatus that can have different ANR settings. For example, one ANR setting may be used where a user of headphones is simply seeking noise reduction, but is not listening to input audio, and another ANR setting may be used where a user is listening to input audio.

4.14 The circuit in this apparatus includes an analog-to-digital converter, a digital-to-analog converter, a processing device (*e.g.*, a digital signal processor), and a program stored in memory. The program instructs the processor to process a digital signal in a pathway between the analog-to-digital converter and the digital-to-analog converter using a set of digital filters. This digital signal processing pathway is used to provide analog anti-noise sounds at the output of the digital-to-analog converter designed to cancel the noise represented by the signal received through the analog-to-digital converter.

4.15 The circuitry used to implement the ANR supports various types of digital filters, and the program instructs the processor to select particular digital filters and to connect them together in accordance with a particular ANR setting (*e.g.*, where no input audio is present). The digital filters are configured with coefficients for the particular ANR setting. The particular ANR setting (*e.g.*, where no input audio is present) can be changed to a different ANR setting (*e.g.*, where input audio is present).

### **D. The '992 Patent**

#### **1. Identification of the Patent and Ownership by Bose**

4.16 Bose owns by assignment the entire right, title, and interest in the '992 patent entitled "High Frequency Compensating," which issued on December 6, 2011. The '992 patent

issued from U.S. Patent Application Serial No. 12/409,894, filed on April 24, 2006. The inventor of the '992 patent, Roman Sapiejewski, assigned to Bose all right, title, and interest in the invention disclosed and claimed in the '992 patent. *See Exhibit 9*. The '992 patent is valid, enforceable, and in full force and effect. A certified copy of the '992 patent is attached as **Exhibit 4**.

4.17 Pursuant to Commission Rule 210.12(c), this Complaint is accompanied by a copy of the prosecution history for the '992 patent and three additional copies of the prosecution history (**Appendix D**). Four copies of each reference document mentioned in the prosecution history accompany this Complaint. *See Appendix I*.

## **2. Non-Technical Description of the Patented Invention**

4.18 The '992 patent generally relates to methods and apparatuses for increasing phase margin, *i.e.*, reducing time delay, in a feedback circuit of an ANR headphone. This is desirable because a longer time delay between the noise and the noise cancelling signal results in less effective noise reduction. The '992 patent increases phase margin by using a compensation pattern, which is used to derive the noise cancelling signal, that has a positive slope for a range of frequencies above 10 kHz. One example of this novel approach is shown graphically as line 72 in Figure 5 of the '992 patent, where there is a positive slope for a range of frequencies above 10 kHz. This is distinguished from a conventional approach, which is shown as line 70 in Figure 5, which does not have a positive slope for a range of frequencies above 10 kHz. Using the novel compensation pattern reduces the time delay (also known as phase shift) between the noise and noise canceling signals in the range of frequencies which is audible to a user, as compared to using a conventional approach.



## **E. The '888 Patent**

### **1. Identification of the Patent and Ownership by Bose**

4.19 Bose owns by assignment the entire right, title, and interest in the '888 patent entitled "Digital High Frequency Phase Compensation," which issued on January 1, 2013. The '888 patent issued from U.S. Patent Application Serial No. 12/750,309, which was filed on March 30, 2010, as a continuation-in-part of U.S. Patent Application Serial No. 12/431,003, filed on April 28, 2009. The inventors of the '888 patent, Ricardo Carreras, Daniel Gauger, Jr., and Steven Isabelle, assigned to Bose all right, title, and interest in the invention disclosed and claimed in the '888 patent. *See Exhibit 10.* The '888 patent is valid, enforceable, and in full force and effect. A certified copy of the '888 patent is attached as **Exhibit 5**.

4.20 Pursuant to Commission Rule 210.12(c), this Complaint is accompanied by a copy of the prosecution history for the '888 patent and three additional copies of the prosecution history (**Appendix E**). Four copies of each reference document mentioned in the prosecution history accompany this Complaint. *See Appendix J.*

### **2. Non-Technical Description of the Patented Invention**

4.21 The '888 patent generally relates to methods and apparatuses for implementing ANR using a digital filter that introduces one or more zeroes to add gain, which is done to introduce positive phase in a signal pathway used for ANR. The gain follows a frequency-dependent "ski slope" curve with increasing gain at higher frequencies, and flattening at even higher frequencies.

4.22 The bottom graph in Figure 11b of the '888 patent shows an example of a "ski slope" curve, which can be achieved through the introduction of zeroes to the digital filters used in the ANR circuitry. Employing this frequency-dependent positive phase shift counteracts the negative phase shift that is present. An example of the result is shown in the bottom graph in

Figure 11c, where there is a flattening of the curve for a range of frequencies starting at about 15 kHz. This is an improvement over the pre-existing shape of the curve, shown in the bottom graph in Figure 11a, which more quickly drops off to more negative phase shift.

**F. Foreign Counterparts to the Asserted Patents**

4.23 The foreign patents or patent applications corresponding to the Asserted Patents are listed in **Exhibit 30**. No other corresponding foreign patents or patent applications are known to Bose.

**V. UNLAWFUL AND UNFAIR ACTS – PATENT INFRINGEMENT**

5.1 The infringement allegations contained in this Complaint include direct and indirect infringement. All Respondents infringe directly and infringe indirectly through contributory infringement and/or inducement to infringe (either literally or under the doctrine of equivalents) all of the Asserted Patents. All Respondents have actual notice of their infringement of the Asserted Patents at least by service of this Complaint and other prior notice.

**A. Direct Infringement**

5.2 At least some of the Accused Products are manufactured, assembled and/or packaged overseas in at least China and/or Hong Kong by at least Respondent Fugang. *See Exhibits 24, 28 & 29*. Upon information and belief, Fugang imports and/or sells for importation into the United States these Beats-branded Accused Products. The Accused Products are imported into the United States, sold for importation into the United States, and/or sold after importation into the United States by at least Respondents BEL, BEI, and PCH. *See Exhibits 16-18*. Thus, upon information and belief, the Respondents directly infringe the Asserted Patents.

5.3 BEL also directly infringes the Asserted Patents through the offer for sale and sale of its products in the United States after importation. Upon information and belief, BEL further

directly infringes Asserted Patents through the use of its products in the United States after importation, for example at its store in New York City.

5.4 In each Asserted Patent, Bose asserts at least one device or apparatus claim that Respondents directly infringe as set forth above. Bose also asserts method claims including independent claim 19 of the '537 patent, independent claim 18 of the '992 patent, and independent claim 1 of the '888 patent. Those method claims are directly infringed at least by operation of the Accused Products, and may also be infringed through manufacture and/or testing.

5.5 The Accused Products are designed to use the infringing noise cancelling functionality when operated by an end user. For example, when used to listen to music, the Beats Studio® and Studio® Wireless use noise cancellation to “*automatically strike[] the perfect blend between your music and the world outside.*” See **Exhibits 38-39** (emphasis added). The Accused Products can also be used for noise cancellation when no music is played, a feature that Beats also advertises. See *id.* Beats advertises no method to turn off features that cause end users to directly infringe claims of the Asserted Patents. Accordingly, the Accused Products are not suitable for any substantial noninfringing use, and are specially adapted for infringing use at the time of their importation into the United States.

## **B. Indirect Infringement**

5.6 Beats knowingly induces end users in the United States to use the Accused Products in an infringing manner. See **Exhibits 36 & 37** (instructions for consumers of Accused Products). Beats' inducement of infringement includes, but is not limited to: (i) its knowledge of the Asserted Patent; (ii) its intent to induce end users to directly infringe the Asserted Patent; (iii) its knowingly aiding and abetting infringement, by providing instructions and other directions that teach end users of the Accused Products to use the products in a manner that infringes

certain claims of the Asserted Patents; and (iv) its actual or constructive knowledge that their actions induce infringement.

5.7 Beats has designed the infringing ANR functionality to be used automatically when a user is listening to music, and instructs a user on how to implement ANR functionality when a user simply desires noise reduction. *See Exhibits 36 & 37.* Thus, Beats specifically encourages users to use the infringing functionality.

5.8 As a result of at least the service of this Complaint and other prior notice upon Respondents at the addresses referenced herein, upon information and belief Respondents know or are willfully blind to the fact that the Accused Products are especially made or especially adapted for a use that infringes the Asserted Patents, and that the Accused Products are not a staple article or commodity of commerce suitable for a substantial non-infringing use.

### **C. Examples of Infringement by Respondents**

5.9 The identification of specific models below is not intended to limit the scope of the investigation; the Accused Products are noise cancelling devices and products containing the same sold for importation, imported, or sold after importation by the Respondents.

#### **1. Infringement of the '537 Patent**

5.10 Both Beats Studio® and Beats Studio® Wireless, infringe at least claims 1-3, 5-7, 9-12, 14-16, and 18-19 of the '537 patent. A claim chart showing infringement of independent claims 1, 10, and 19 of the '537 patent by the Accused Products is attached as **Exhibit 31**.

#### **2. Infringement of the '150 Patent**

5.11 Both Beats Studio® and Beats Studio® Wireless, infringe at least claims 14 and 22-23 of the '150 patent. A claim chart showing infringement of independent claim 14 of the '150 patent by the Accused Products is attached as **Exhibit 32**.

### **3. Infringement of the '151 Patent**

5.12 Both Beats Studio® and Beats Studio® Wireless, infringe at least claims 14, 18, 23, and 25 of the '151 patent. A claim chart showing infringement of independent claim 14 of the '151 patent by the Accused Products is attached as **Exhibit 33**.

### **4. Infringement of the '992 Patent**

5.13 Both Beats Studio® and Beats Studio® Wireless, infringe at least claims 1, 4, 6, 15-16, and 18 of the '992 patent. A claim chart showing infringement of independent claims 1, 15, and 18 of the '992 patent by the Accused Products is attached as **Exhibit 34**.

### **5. Infringement of the '888 Patent**

5.14 Both Beats Studio® and Beats Studio® Wireless, infringe at least claims 1-2, 5-9, 11-14, and 16 of the '888 patent. A claim chart showing infringement of independent claims 1, 7, and 13 of the '888 patent by the Accused Products is attached as **Exhibit 35**.

## **VI. SPECIFIC INSTANCES OF UNFAIR IMPORTATION AND SALE**

6.1 Beats offers the Accused Products for sale in the United States. For example, attached **Exhibit 21** includes a description of an offer for sale of the Beats Studio® and Beats Studio® Wireless products on Beats' United States website. *See also Exhibits 38-39*.

6.2 On or about June 20, 2014, two samples of each of Beats Studio® and Beats Studio® Wireless headphones, which infringe the Asserted Claims of the Asserted Patents as set forth above, were purchased from Best Buy in the United States. *See Exhibit 19*. Best Buy is an authorized retailer for Beats products. *See Exhibit 21*. Each Beats Studio® and Studio® Wireless product purchased on or about June 20, 2014 was contained in a box with a "Made in China" marking on the bottom. **Exhibits 28-29**. Additionally, the Beats Studio® Wireless headphones contained within the box were imprinted with "FCC ID:COWB0501" on its headband. *See Exhibit 29*. Upon information and belief, this "FCC ID" indicates that the

product was manufactured in accord with the compliance report submitted to the FCC, which report specifies that the marked product was manufactured by Respondent Fugang in Shenzhen, China. *See Exhibit 24.*

## **VII. DOMESTIC INDUSTRY**

7.1 A domestic industry exists and/or is in the process of being established as defined by 19 U.S.C. §§ 1337(a)(2)-(3)(A), (B), and/or (C) based on significant investment in plant and equipment; significant employment of labor or capital; and substantial investment in exploitation of the patent, including engineering and research and development relating to Bose's noise cancelling headphones. At least two current Bose headphone models practice one or more claims of each of the Asserted Patents: QuietComfort® 20 Acoustic Noise Cancelling® headphones ("QC20") and QuietComfort® 20i Acoustic Noise Cancelling® headphones ("QC20i"). *See Confidential Exhibits 42C, 43C, 46C, and 47C.* Bose's domestic industry products that practice one or more claims of each of the Asserted Patents, which include at least the QC20 and QC20i, are collectively referenced herein as the "Domestic Industry Products." Photographs of the Bose® QC20 and QC20i are attached as **Exhibits 50-51**, respectively.

### **B. Technical Prong**

7.2 Bose has developed and continues to develop and sell the Domestic Industry Products in the United States. The Domestic Industry Products practice at least one claim of each of the Asserted Patents.

7.3 A claim chart demonstrating how the Bose® QC20 and QC20i practice an exemplary claim of the '537 patent is attached as **Confidential Exhibit 43C**.

7.4 A claim chart demonstrating how the Bose® QC20 and QC20i practice an exemplary claim of the '150 patent is attached as **Confidential Exhibit 44C**.

7.5 A claim chart demonstrating how the Bose® QC20 and QC20i practice an exemplary claim of the '151 patent is attached as **Confidential Exhibit 45C**.

7.6 A claim chart demonstrating how the Bose® QC20 and QC20i practice an exemplary claim of the '992 patent is attached as **Confidential Exhibit 46C**. Additional Bose consumer and military products also practice the '992 patent. Bose has focused this complaint on those products common to the Asserted Patents for convenience only, and reserves the right to rely on additional products.

7.7 A claim chart demonstrating how the Bose® QC20 and QC20i practice an exemplary claim of the '888 patent is attached as **Confidential Exhibit 47C**.

**C. Economic Prong**

7.8 Bose conducts significant and substantial domestic industry activities in the United States relating to products which practice at least one claim of each Asserted Patent. These activities include Bose's significant investment in plant and equipment, significant employment of labor and capital, and substantial investment in the exploitation of the Asserted Patents through engineering and research and development that relate to products that practice at least one claim of each of the Asserted Patents. *See Confidential Exhibit 42C*.

7.9 Bose has made and continues to make significant investment in plant and equipment in the United States dedicated to the research, development, engineering, design, product support, and warranty service for the Domestic Industry Products. Bose has also made and continues to make investment in plant and equipment in the United States related to research and development, engineering, and design. Bose's investment in domestic plant and equipment is described in **Confidential Exhibit 42C**.

7.10 Bose has employed and continues to employ a significant number of employees in the United States who work on the research, development, engineering, design, product support,

and warranty service associated with the Domestic Industry Products. In addition, Bose has invested and continues to invest significant domestic capital toward research, development, engineering, and design for the Domestic Industry Products. Bose has also invested and continues to invest significant domestic capital toward product support and warranty services for the Domestic Industry Products. Bose plans to continue to invest significant domestic capital toward product support and warranty services. **Confidential Exhibit 42C** describes some of Bose's domestic investments in labor and capital Bose for these activities.

7.11 Bose has made and continues to make substantial investments in the exploitation of its rights in the Asserted Patents in the United States. Bose has invested, continues to invest in domestic research and development, design, and engineering of the Domestic Industry Products. **Confidential Exhibit 42C** sets forth some of Bose's substantial domestic investments in the exploitation of the Asserted Patents.

### **VIII. HARMONIZED TARIFF SCHEDULE NUMBER**

8.1 Upon information and belief, the Harmonized Tariff Schedule of the United States item numbers under which the infringing products have been imported into the United States are HTUS 8518 and subsections thereof, including 8518.30.20, "Headphones, earphones and combined microphone/speaker sets, other than telephone handsets." This classification is intended for illustrative purposes only and is not intended to restrict the scope or type of accused product.

### **IX. LICENSES**

9.1 A list of the licensees of the Asserted Patents is provided in **Confidential Exhibit 41C**.



## **X. RELATED LITIGATION**

10.1 Shortly after filing this complaint, Bose plans to file a complaint asserting infringement of the Asserted Patents by Beats in the U.S. District Court for the District of Delaware. There has not been any other related litigation or administrative proceeding involving the Asserted Patents or the subject matter thereof.

## **XI. REQUESTED RELIEF**

11.1 WHEREFORE, by reason of the foregoing, Bose respectfully requests that the United States International Trade Commission:

(a) Institute an immediate investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, with respect to violations of Section 337 based on the Respondents' unlawful importation into the United States, sale for importation into the United States, and/or sale within the United States after importation of certain noise cancelling headphones and components thereof, which infringe one or more claims of United States Patent Nos. 6,717,537; 8,073,150; 8,073,151; 8,054,992; and 8,345,888;

(b) Set a target date of no more than fifteen months;

(c) Schedule and conduct a hearing on the unlawful acts and, following the hearing, determine that there has been a violation of Section 337;

(d) Issue a permanent limited exclusion order pursuant to Section 337(d) of the Tariff Act of 1930, as amended, excluding from entry into and sale within the United States all Respondents' certain noise cancelling headphones and components thereof, which infringe one or more claims of United States Patent Nos. 6,717,537; 8,073,150; 8,073,151; 8,054,992; and 8,345,888;

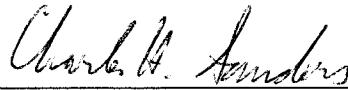
(e) Issue permanent cease and desist orders, pursuant to Section 337(f) of the Tariff Act of 1930, as amended, directing the Respondents, their affiliates, subsidiaries,

successors, or assigns, to cease and desist from importing, marketing, advertising, testing, demonstrating, installing, servicing, repairing, selling, offering for sale, or moving, shipping, or warehousing inventory of certain noise cancelling headphones and components thereof, which infringe one or more claims of United States Patent Nos. 6,717,537; 8,073,150; 8,073,151; 8,054,992; and 8,345,888;

(f) Impose a bond upon Respondents who continue to import infringing articles during the 60-day Presidential Review period per 19 U.S.C. § 1337(j); and

(f) Grant such other and further relief as the Commission deems just and proper based on the facts determined in the investigation and the authority of the Commission.

Respectfully submitted,



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Charles H. Sanders  
Suhrid A. Wadekar  
M. Frank Bednarz  
GOODWIN PROCTER LLP

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Exchange Place  
53 State Street  
Boston, MA 02109-2802  
Tel: (617) 570-1000  
Fax: (617) 523-1231

Kecia J. Reynolds  
GOODWIN PROCTER LLP  
901 New York Avenue, N.W.  
Washington, DC 20001-4332  
Tel: (202) 346-4000  
Fax: (202) 346-4444

*Attorneys for Complainant Bose Corporation*

Dated: July 24, 2014

## VERIFICATION OF COMPLAINT

I, Sean Garrett, declare in accordance with 19 C.F.R. §§ 210.4 and 210.12(a)(1) that the following statements are true:

1. I am currently Vice President of the Noise Reduction Technology Group for Bose Corporation and I am duly authorized to verify this COMPLAINT OF BOSE CORPORATION UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED (“Complaint”);

2. I have read the foregoing Complaint and am aware of its contents;

3. To the best of my knowledge, information, and belief, formed after an inquiry reasonable under the circumstances, the claims and other legal contentions in the Complaint are warranted by existing law or by a non-frivolous argument for the extension, modification, or reversal of existing law or the establishment of new law;

4. To the best of my knowledge, information, and belief, formed after an inquiry reasonable under the circumstances, the allegations and other factual contentions in the Complaint have evidentiary support or, if specifically so identified, are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and

5. The Complaint is not being presented for any improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of the investigation or related proceeding.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed this 24 day of July 2014.

  
Sean Garrett  
Bose Corporation