UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SIRIUS XM RADIO INC.,
Petitioner,

v.

FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER
ANGEWANDTEN FORSCHUNG E.V.,
Patent Owner.

_____

Case IPR2018-00690
Patent No. 6,314,289

_____

DECLARATION OF WAYNE E. STARK, PH.D.

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P.O. Box 1450

Alexandria, VA 22313-1450

I, Wayne E. Stark, hereby declare as follows:

1.   I have personal knowledge of the facts stated in this Declaration and, if called upon to do so, could and would attest to these facts under oath.

I.   SCOPE OF ENGAGEMENT

2.   I have been retained as a consultant on behalf of Fraunhofer-Gesellschaft Zur Förderung Der Angewandten Forschung E.V. ("Fraunhofer" or "Patent Owner") to explain the technologies involved in U.S. Patent No. 6,314,289 ("the '289 patent"), the technologies described in the cited prior art references, the knowledge of a person of ordinary skill in the art at the time of the invention, and other pertinent facts and opinions regarding IPR2018-00690. My qualifications are summarized below and are addressed more fully in my CV attached as APPENDIX A.

3.   I am being compensated at my usual hourly rate of $600 per hour. My compensation is not dependent on the outcome of this proceeding or on the content of my opinions, including any opinions provided herein. I do not have a financial interest in this matter.

4.   The opinions I have formed as explained in this declaration are informed by and based on my consideration of the '289 patent and its examination file history, the documents cited by Sirius XM Radio Inc. ("SXM"

or "Petitioner") in its petition, the Board's institution decision, the references cited in SXM's petition and Dr. Lyon's declaration [Ex. 1002], the references cited herein, as well as my own knowledge and experience based on my work and research in the relevant field of technology, as discussed below.

5.   For my analysis, I am instructed to assume a priority date of December 3, 1998, the same date applied by Petitioner's expert Dr. Lyon. *See* Ex. 1001 ['289 patent]; Ex. 1002 at ¶¶ 60, 62. I am familiar with the state of the art in digital communications, error correcting codes, and satellite technologies on and before December 3, 1998.

6.   As my CV indicates, I had more than the qualifications of a person of ordinary skill in the art as of December 3, 1998. But I provide my analyses and opinions from the perspective of a person of ordinary skill in the art as of December 3, 1998, unless stated otherwise. I am familiar with the knowledge and experience of a person of ordinary skill in the art because of my background and years of experience working with people of such a skill level and through my research, teaching and consulting.

II.   BACKGROUND

7.   I am currently Professor of Electrical Engineering and Computer Science at the University of Michigan, Ann Arbor.

8.   Prior academic positions I have held include Associate Professor of Electrical Engineering and Computer Science and Assistant Professor of Electrical Engineering and Computer Science, both at the University of Michigan, Ann Arbor, where I have held faculty positions since 1982.

9.   I have been a Fellow of the Institute of Electrical and Electronics Engineers ("IEEE") since 1997 and have been the recipient of various honors, awards, and grants related to my research on communication technologies, as detailed in my CV at Appendix A.

10.   I obtained my Ph.D. (1982), M.S. (1979), and B.S. (1978, with highest honors) in electrical engineering from the University of Illinois.

11.   In addition to my employment experience, my CV details my service activities, consulting work, patents and publications, and other relevant professional activities.

III.   BACKGROUND OF THE '289 PATENT

12.   The '289 Patent has a priority date of December 3, 1998 and is entitled, "Apparatus and Method for Transmitting Information and Apparatus and Method for Receiving Information." By way of example, the systems disclosed in the '289 patent can be a satellite system that provides information to a moving vehicle such as a car (e.g., satellite radio). As described in the '289 patent satellite systems are primarily effective in rural areas because

urban areas may contain buildings such as skyscrapers that at least partially

block the signal thus decreasing the received signal power relative to the power

corresponding to a line of sight propagation. Ex. 1001 ['289 Patent] at 1:13-

26. Figure 7 of the '289 patent shows "a transmitter receiver system

implementing time and space diversity, in which the output of the transmitter

encoder is duplicated and a channel selection is performed in the receiver." *Id*
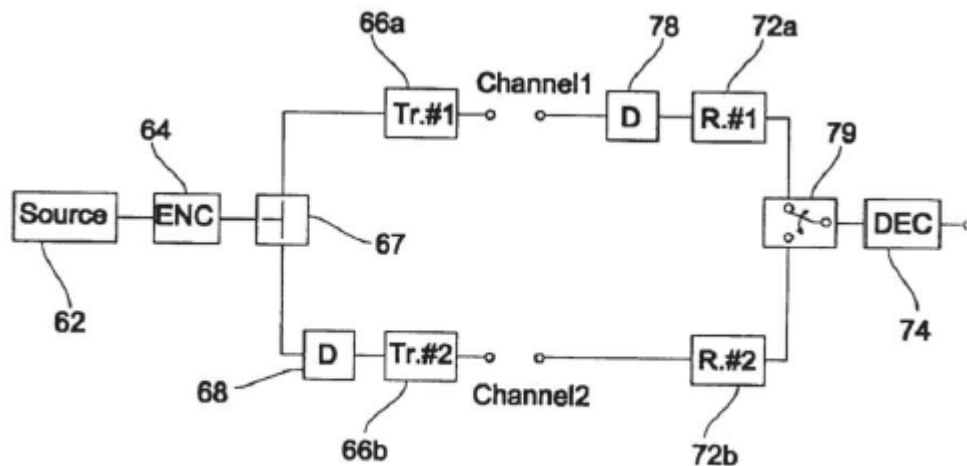
at 7:8-11.

Fig. 7

13.   The system includes two transmitters, 66a and 66b, that can be

two satellites transmitting information on two different, spatially separate

channels. *Id.* at 2:23-36. The satellites receive information from the same

source 62. *Id.* at 2:28-39. The satellites are located at different positions so

that, if a car is in an urban area, the possibility of the vehicle receiving

information from at least one satellite is increased. *Id.* at 2:37-44. The system

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