

DECLARATION OF GERARD P. GRENIER

I, Gerard P. Grenier, am over twenty-one (21) years of age. I have never been convicted of a felony, and I am fully competent to make this declaration. I declare the following to be true to the best of my knowledge, information and belief:

1. I am Senior Director of Publishing Technologies of the Institute of Electrical and Electronics Engineers, Inc. ("IEEE").
2. IEEE is a neutral third party in this dispute.
3. Neither I nor IEEE itself is being compensated for this declaration.
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7. It is the regular practice of IEEE to publish articles and other writings including article abstracts and make them available to the public through IEEE Xplore. IEEE maintains copies of publications in the ordinary course of its regularly conducted activities.
8. The article below has been attached as Exhibits A to this declaration:

A.	J.C. Rault, et al. "The coded orthogonal frequency division multiplexing (COFDM) technique, and its application to digital radio broadcasting towards mobile receivers" IEEE Global Telecommunications Conference and Exhibition 'Communications Technology for the 1990s and Beyond (GLOBECOM), November 27-30, 1989.
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9. I obtained a copy of Exhibit A through IEEE Xplore, where it is maintained in the ordinary course of IEEE's business. Exhibit A is a true and correct copy of the Exhibit as it existed on or about December 10, 2016.
10. The article abstracts from IEEE Xplore shows the date of publication. IEEE Xplore populates this information using the metadata associated with the publication

11. J.C. Rault, et al. "The coded orthogonal frequency division multiplexing (COFDM) technique, and its application to digital radio broadcasting towards mobile receivers" was published in IEEE Global Telecommunications Conference and Exhibition 'Communications Technology for the 1990s and Beyond (GLOBECOM). IEEE Global Telecommunications Conference and Exhibition 'Communications Technology for the 1990s and Beyond (GLOBECOM) was held from November 27-30, 1989. Attendees of the conference were provided copies of the publication no later than the last day of the conference. The article is currently available for public download from the IEEE digital library, IEEE Xplore.

12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

I declare under penalty of perjury that the foregoing statements are true and correct.

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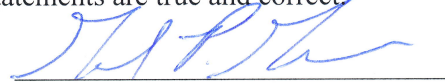


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J.C. Rault ; D. Castelain ; B.L. Le Floch

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Abstract:

A system which is able to broadcast at high data rates in a selective Rayleigh channel is presented. This technique combines an orthogonal frequency division multiplexing technique and a convolutional coding scheme associated with a Viterbi decoding algorithm. This system is able to benefit from wideband transmission by employing the information contained in all the echoes of the multipath channel while having a very good spectral efficiency and a low computational complexity. The authors present the theoretical principles of the system. They describe the realization of a complete COFDM (coded orthogonal frequency division multiplexing) system, designed within the framework of the DAB (digital audio broadcasting) EUREKA 147 project, which is able to broadcast at 5.6 Mb/s in a bandwidth of 7 MHz. At present, this rate corresponds to 16 high-quality stereophonic programs. Network aspects are pointed out as far as the introduction of a new radio broadcasting service is concerned.

Published in: Global Telecommunications Conference and Exhibition 'Communications Technology for the 1990s and Beyond' (GLOBECOM), 1989.
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Date of Conference: 27-30 Nov, 1989**INSPEC Accession Number:** 3719102**Date Added to IEEE Xplore:** 06 August 2002**DOI:** 10.1109/GLOCOM.1989.64008**Publisher:** IEEE

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7 MHz, coded orthogonal frequency division multiplexing, digital radio broadcasting, mobile receivers,

12/10/2016 The coded orthogonal frequency division multiplexing (COFDM) technique, and its application to digital radio broadcasting towards mobile receivers - I...
selective Rayleigh channel, convolutional coding scheme, wideband transmission, EUREKA 147
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Authors

J.C. Rault
CCETT, Cesson Sevigne, France

D. Castelain
CCETT, Cesson Sevigne, France

B.L. Le Floch
CCETT, Cesson Sevigne, France

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