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(71) Applicant: USA DIGITAL RADIO, INC. [US/US]; Suite 202, 8865 Stanford Boulevard, Columbia, MD 21045 (US).

(72) Inventors: HARTUP, David, Carl; 8851 Timberchase Court, West Chester, OH 45069 (US). GOLDSTON, Don, R.; 9888 Whippoorwill Drive, Mason, OH 45040 (US).

(74) Agent: LENART, Robert, P.; Eckert Seamans Cherin & Mellott, LLC, 44th floor, 600 Grant Street, Pittsburgh, PA 15219 (US).

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(54) Title: METHOD AND APPARATUS FOR DEMODULATING AND EQUALIZING AN AM COMPATIBLE DIGITAL AUDIO BROADCAST SIGNAL

(57) Abstract

A method of demodulation and equalization is used to process an amplitude modulated compatible digital broadcasting signal including an amplitude modulated radio frequency signal having a first carrier modulated by an analog program signal in a first frequency spectrum, a plurality of digitally modulated carrier signals positioned within a bandwidth which encompasses the first frequency spectrum, a first group of the digitally modulated carrier signals including complementary carrier signals and lying within the first frequency spectrum, and second and third groups of the digitally modulated carrier signals including non-complementary carrier signals and lying outside of the first frequency spectrum. The method includes the steps of: taking a first Fast Fourier Transform of the amplitude modulated compatible digital signal to produce a first transformed signal representative of the non-complementary carriers; processing the first transformed signal to produce a first equalized signal by multiplying the first transformed signal by a first equalization vector, wherein the first equalization vector includes a first plurality of equalizer coefficients; updating the first plurality of equalizer coefficients; taking a second Fast Fourier Transform of the amplitude modulated compatible digital signal to produce a second transformed signal representative of the complementary carriers; determining a second equalization vector comprising a second plurality of equalizer coefficients, wherein the second plurality of equalizer coefficients is determined by interpolating coefficients of the first plurality of equalizer coefficients; and processing the second transformed signal to produce a second equalized signal by multiplying the second transformed signal by the second equalization vector. The invention also encompasses the operation of radio frequency receivers which utilize the above method, as well as apparatus that performs the above method and radio frequency receivers which utilize the above equalization method.

