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(21) International Application Number: PCT/US99/20277 (22) International Filing Date: 2 September 1999 (02.09.99) (30) Priority Data: 09/207,894 2 October 1998 (02.10.98) US (71) Applicant: USA DIGITAL RADIO, INC. [US/US]; Suite 202, 8865 Stanford Boulevard, Columbia, MD 21045 (US). (72) Inventors: GOLDSTON, Don, R.; 9888 Whippoorwill Drive, Mason, OH 45040 (US). HARTUP, David, Carl; 8851 Tim- berchase Court, West Chester, OH 45069 (US). MATH- ERNE, Marcus, M.; 7866 Kristen Drive, West Chester, OH 45069 (US). (74) Agent: LENART, Robert, P.; Eckert Seamans Cherin & Mellott, LLC, 44th floor, 600 Grant Street, Pittsburgh, PA 15219 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: METHOD FOR EQUALIZATION OF COMPLEMENTARY CARRIERS IN AN AM COMPATIBLE DIGITAL AUDIO BROADCAST SYSTEM

(57) Abstract

A method is provided for equalizing an amplitude modulated compatible digital broadcasting signal which includes an amplitude modulated radio frequency signal having a first frequency spectrum, the amplitude modulated radio frequency signal having a first carrier modulated by an analog program signal, 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 signals and lying within the first frequency spectrum, and second and third groups of the digitally modulated carrier signals including non-complementary signals and lying outside of the first frequency spectrum. The method includes the steps of producing a first signal representative of in-phase components of the amplitude modulated compatible digital broadcasting signal; producing a second signal representative of quadrature-phase components of the amplitude modulated compatible digital broadcasting signal; using the first and second signals as the real and imaginary inputs to take the Fast Fourier Transform of the first and second signals to produce a plurality of transformed signals representative of frequency domain data; processing the transformed signals by multiplying the transformed signals by an equalization vector, with the equalization vector comprising a plurality of equalizer coefficients; and updating the equalizer coefficients used for the complementary signals by interpolating coefficients of the vector for the non-complementary signals. 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.

