

United States Patent [19]
McGibney

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[54] **OFDM TIMING AND FREQUENCY RECOVERY SYSTEM**

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Related U.S. Application Data

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[58] **Field of Search** 370/208, 210, 370/207, 203, 206, 18, 19, 20; 375/326, 344, 260, 97, 98, 118, 119, 80, 84

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[57] **ABSTRACT**

A synchronizing apparatus for a differential OFDM receiver that simultaneously adjust the radio frequency and sample clock frequency using a voltage controlled crystal oscillator to generate a common reference frequency. Timing errors are found by constellation rotation. Subcarrier signals are weighted by using complex multiplication to find the phase differentials and then the timing errors. The reference oscillator is adjusted using the timing errors. Slow frequency drift may be compensated using an integral of the timing error. Frequency offset is found using the time required for the timing offset to drift from one value to another.

10 Claims, 5 Drawing Sheets

