

**METHOD AND SYSTEM FOR SYNCHRONIZING  
TIME-DIVISION-DUPLEX TRANSCEIVERS**

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**ABSTRACT OF THE DISCLOSURE**

Improved techniques for synchronizing transmissions and receptions of a data transmission system utilizing time division duplexing is disclosed. The improved synchronization techniques utilize the time-varying nature of the energy of the received data to obtain synchronization. In one embodiment, an improved synchronization processing (500) measures energy (502) in  $n$  consecutive frames of received data. An alignment error estimate is then computed (504) based on the measured energy values for the  $n$  consecutive frames. In another embodiment, the improved synchronization technique uses the output signals from a multicarrier modulation unit (FFT unit) and thus provides the ability to avoid frequency tones that are susceptible to RF interference. The improved synchronization techniques can also utilize crosstalk interference levels to obtain synchronization. Remote receivers in the data transmission system are able to synchronize to central transmitters, central receivers in the data transmission system are able to synchronize to remote transmitters, and central transmitters are able to synchronize with one another.

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