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(54) **SYSTEM AND METHOD FOR COMMUNICATING DIGITAL INFORMATION USING TIME-AND-FREQUENCY-BOUNDED BASE FUNCTIONS**

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(57) **ABSTRACT**

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Systems and methods for efficiently conveying one or more broadband communication channels over a transmission medium. Communication is effected by transforming an incoming digital bit stream into a Time-and-Frequency-Bounded (TFB) information stream that includes a plurality of TFB packets. This transformation is accomplished through the use of a plurality of TFB basis functions. More particularly, digital bit streams carried on one or more incoming channels are in the form of binary "on" and "off" bits. These digital bits are converted into a plurality of TFB waveform components which together comprise a TFB packet. The conversion process maps each of respective incoming digital bits to a corresponding one of a group of TFB functions, such that a first group of n bits is mapped to a first TFB function, a second group is mapped to a second TFB function etc. in a cyclical fashion.

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Related U.S. Application Data

(63) Continuation of application No. 10/922,754, filed on Aug. 20, 2004, now Pat. No. 6,944,118, which is a continuation-in-part of application No. 10/326,318, filed on Dec. 20, 2002, now Pat. No. 6,898,207, which is a continuation-in-part of application No. 10/215,806, filed on Aug. 8, 2002, which is a continuation-in-part of application No. 10/022,333, filed on Dec. 20, 2001, which is a continuation of application No. 09/120,448, filed on Jul. 22, 1998, now Pat. No. 6,404,779.

