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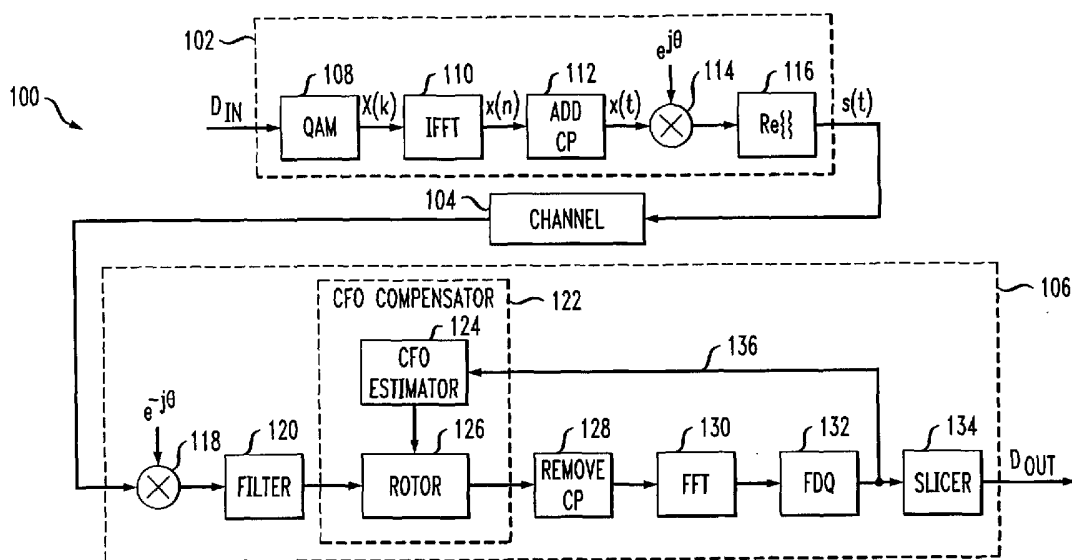
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- (51) International Patent Classification<sup>7</sup>: H04K 1/10, H04L 27/28, H04B 1/10 (72) Inventor: BANERJEA, Raja; 1 Berkeley Place, Eatontown, NJ 07724 (US).
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10/625,028 22 July 2003 (22.07.2003) US
- (71) Applicant: AGERE SYSTEMS INC. [US/US]; 1110 American Parkway NE, Allentown, PA 18109 (US). For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CARRIER FREQUENCY OFFSET ESTIMATION IN A WIRELESS COMMUNICATION SYSTEM



(57) Abstract: An OFDM receiver comprises a demodulator configurable for receiving a passband signal including a plurality of symbols, at least one of the symbols being a reference symbol, and for converting the passband signal to a baseband signal, a CFO compensation circuit configurable for receiving the baseband signal and modifying a phase of the baseband signal in response to a first control signal, a transformation circuit configurable for translating the baseband signal from the CFO compensation circuit into a frequency domain constellation, an equalizer configurable for receiving the frequency domain constellation and modifying the frequency domain constellation based at least in part on the reference symbol, and a CFO estimation circuit operatively coupled between an output of the equalizer and the CFO compensation circuit in a feedback configuration.

WO 2004/014008 A3

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US03/23799

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) : H04K 1/10; H04L 27/28; H04B 1/10		
US CL : 375/260, 350		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 375/260, 350, 229, 262, 232, 329, 334, 341, 346; 370/608, 210, 206		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,E	US 2004/0001427 A1 (BELOTSEKOVSKY et al) 01 January 2004, fig. 2 element 52; fig. 3, element 46 and 68.	1-3, 5-8, 11, 13-21
Y	KATAOKA, et al. "Adaptive Equalizer Including Frequency-Offset Compensator for Multi-Carrier Communication Systems" IEEE Symposium on PIMRC '98, September 1998, Vol. 3, pp. 1076-1080.	1-3, 5-8, 11, 13-21
Y	TERRY et al. "OFDM wireless LANs: A Theoretical and Practical Guide", Sams Publishing, 11 December 2001, ISBN 0-672-32157-2, pp. Chapter 2.	2, 7, 14, 17
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
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**Continuation of B. FIELDS SEARCHED Item 3:**  
USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM\_TDB  
carrier WITH offset AND equaliz\$ AND phase with baseband