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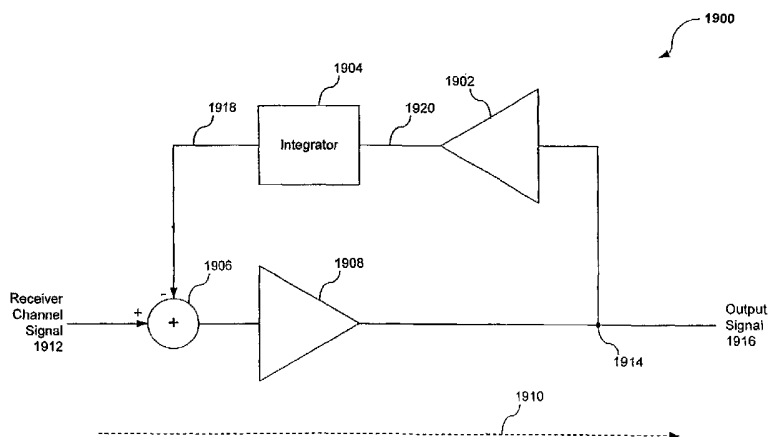
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR REDUCING DC OFFSETS IN A COMMUNICATION SYSTEM



(57) Abstract: Methods and apparatuses for reducing DC offsets in a communication system are described. In a first aspect, a feedback loop circuit reduces DC offset in a wireless local area network (WLAN) receiver channel (1912). The frequency response of the feedback loop circuit can be variable. In a second aspect, a circuit provides gain control in a WLAN receiver channel. The stored DC offset (1904) is subtracted (1906) from the receiver channel. First and second automatic gain control (AGC) amplifiers (1908, 1902) are coupled in respective portions of the receiver channel. In a third aspect, a feedback loop circuit reduces DC offset in a WLAN receiver channel. The feedback loop circuit includes a storage element (1904) that samples and stores receiver channel DC offset. The loop is opened, and the DC offset stored in the storage element is subtracted from the receiver channel. Circuits for monitoring DC offset, and for providing control signals for controlling the frequency response of the DC offset reducing circuits are also provided.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/35861

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(7) : H04B 1/10 US CL : 375/346		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 375/285, 346, 349, 351; 327/307, 341		
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)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,898,912 A (HECK et al) 27 April 1999 (27.04.1999), figs. 2-5 and column 2, line 13 to column 5, line 10.	1-58, 67-81 and 90-93
X	US 5,793,817 A (WILSON) 11 August 1998 (11.08.1998), figs. 1, 3 and 4 and column 4, line 38 to column 7, line 13.	1-58, 67-81 and 90-93
X	US 5,389,839 A (HECK) 14 February 1995 (14.02.1995), figs. 1 and 4 and column 2, line 4 to column 4, line 6.	1-58, 67-81 and 90-93
A	US 6,313,685 B1 (RABII) 06 November 2001 (06.11.2001), abstract and figs. 2-4.	1-58, 67-81 and 90-93
A	US 6,225,848 B1 (TILLEY et al) 01 May 2001 (01.05.2001), abstract and figs. 2-5.	1-58, 67-81 and 90-93
A	US 5,751,154 A (TSUGAI) 12 May 1998 (12.05.1998), abstract and figs. 1-3 and 7.	1-58, 67-81 and 90-93
<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
"E"	earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"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	
Date of the actual completion of the international search 29 January 2003 (29.01.2003)		Date of mailing of the international search report 08 MAY 2003
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230		Authorized officer <i>Chi Pham</i> CHI PHAM Telephone No. (703) 305-3800

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/35861

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-58, 67-81 and 90-93

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US02/35861

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-58, 67-81, and 90-93, drawn to a method and apparatus for reducing a DC offset voltage in a communication channel, classified in class H04B 1/10.

Group II, claim(s) 59-66 and 82-89, drawn to a method and apparatus for gain control in a communication channel, classified in class H04L 27/08.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I directs to reducing a DC offset voltage comprising summing node, storage element and switch, whereas Group II directs to gain control comprising multiplier and AGC amplifiers.