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(54) **Title:** RECEIVER SECOND ORDER INTERMODULATION CORRECTION SYSTEM AND METHOD

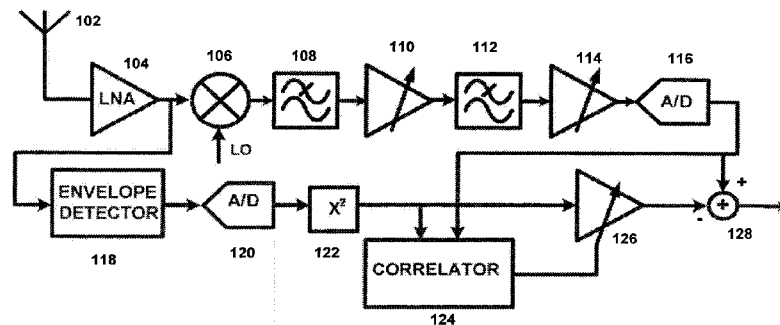


FIGURE 1 100 ↑

(57) **Abstract:** A system for correcting a second order intermodulation product in a direct conversion receiver is provided. The system includes a cross-covariance system receiving a data signal and a second order intermodulation estimate signal and generating a cross-covariance value. An auto-covariance system receives the second order intermodulation estimate signal and generates an auto covariance value. A buffer system stores a second order intermodulation product correction factor. A divider receives the cross-covariance value, the auto-covariance value and the second order intermodulation product correction factor and generates a running average second order intermodulation product correction factor.

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INTERNATIONAL SEARCH REPORT

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PCT/US2009/031108**A. CLASSIFICATION OF SUBJECT MATTER***H04B 1/10(2006.01)i, H04B 1/16(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC H04BDocumentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS (KIPO internal) & keywords : "intermodulation", "receiver", "correlat*", "covarian*"**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003-0021367 A1 (FRANCIS J. SMITH) 30 January 2003 See figures 2-4 and corresponding detailed description.	1-15
A	US 5749051 A (PAUL W. DENT) 05 May 1998 See the abstract and figure 1.	1-15
A	US 6408168 B1 (JOSEPHUS A. M. FRANCISCUS SESSINK) 18 June 2002 See figure 3 and corresponding detailed description.	1-15
A	JP 2001-044862 A (MANNESMANN VDO AG) 16 February 2001 See figure 3 and corresponding detailed description.	1-15

 Further documents are listed in the continuation of Box C. See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003-0021367 A1	30.01.2003	EP 1388229 A4	02.02.2005
		EP 1388229 A1	11.02.2004
		US 7346134 B2	18.03.2008
		WO 2002-093807 A1	21.11.2002
US 5749051 A	05.05.1998	CN 1230309 A	29.09.1999
		CN 1105424 C	09.04.2003
		EP 0913036 B1	04.10.2001
		EP 0913036 A1	06.05.1999
		JP 2000-515342 A	14.11.2000
		KR 10-0452079 B1	30.09.2004
WO 1998-004050 A1	29.01.1998		
US 6408168 B1	18.06.2002	EP 1067697 B1	11.05.2005
		EP 1067697 A1	10.01.2001
		JP 2001-044860 A	16.02.2001
JP 2001-044862 A	16.02.2001	EP 1067698 B1	30.11.2005
		EP 1067698 A1	10.01.2001