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(21) International Application Number: PCT/US99/05695 (22) International Filing Date: 16 March 1999 (16.03.99) (30) Priority Data: 09/040,496 17 March 1998 (17.03.98) US (71) Applicant: SONIC INNOVATIONS, INC. [US/US]; Suite 240, 5330 South 900 East, Salt Lake City, UT 84117 (US). (72) Inventors: NISE, Benjamin, E.; 9746 South Winterwood Drive, Sandy, UT 84092 (US). MEAD, Carver, A.; Suite B, 10131 Bubb Road, Cupertino, CA 95014 (US). FANG, Xiaoling; 11537 South Berryknoll Circle, Draper, UT 84020 (US). (74) Agents: D'ALESSANDRO, Kenneth et al.; D'Alessandro & Ritchie, P.O. Box 640640, San Jose, CA 95164-0640 (US).		(81) Designated States: JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> (88) Date of publication of the international search report: 3 August 2000 (03.08.00)
(54) Title: CONVERTER WITH PROGRAMMABLE GAIN CONTROL <pre> graph LR Input((~)) --> 12[MODULATOR] 12 --> 14[DECIMATOR] 14 --> 16[NORMALIZER] 16 --> Output(()) 16 --> 18[PGC] 18 --> 12 18 --> 14 </pre>		
(57) Abstract An analog-to-digital converter (10) comprises a modulator (12) connected to an analog input signal, a decimator (14) connected to the output of the modulator, a normalizer (16) connected to the output of the decimator and forming a digital output signal, and a programmable gain control circuit (18) connected to the output of the normalizer and providing feedback gain control to the modulator and the decimator.		

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/05695

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H03M 1/12

US CL :341/155, 172

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. : 341/120, 155, 156, 159, 165, 168, 172

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,241,310 A (TIEMANN) 31 August 1993 (31-08-1993), see entire document.	1-2
A	US 5,126,743 A (HOBBS) 30 June 1992 (30-06-1992), see entire document.	1-2

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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