(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 September 2001 (27.09.2001)

PCT

(10) International Publication Number
WO 01/071906 A3

(51) International Patent Classification[7]: H03D 7/00

(21) International Application Number: PCT/US01/08969

(22) International Filing Date: 22 March 2001 (22.03.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/191,110 22 March 2000 (22.03.2000) US
09/566,188 5 May 2000 (05.05.2000) US

(71) Applicant: **PARKERVISION, INC.** [US/US]; 8493 Baymeadows Way, Jacksonville, FL 32256 (US).

(72) Inventors: **COOK, Robert, W.**; 1432 Roberts Road, Switzerland, FL 32259 (US). **BULTMAN, Michael, J.**; 2244 Aztec Drive West, Jacksonville, FL 32246 (US). **LOOKE, Richard, C.**; 3170 Ricky Drive, Jacksonville, FL 32223 (US). **MOSES, Charley, D., Jr.**; 4314 Naranja Drive, Jacksonville, FL 32217 (US). **SORRELLS, David, F.**; 3129 Rideout Lane, Middleburg, FL 32068 (US).

(74) Agents: **LEE, Michael, Q.** et al.; Sterne, Kessler, Goldstein & Fox P.L.L.C., 1100 New York Avenue, N.W., Suite 600, Washington, DC 20005-3934 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

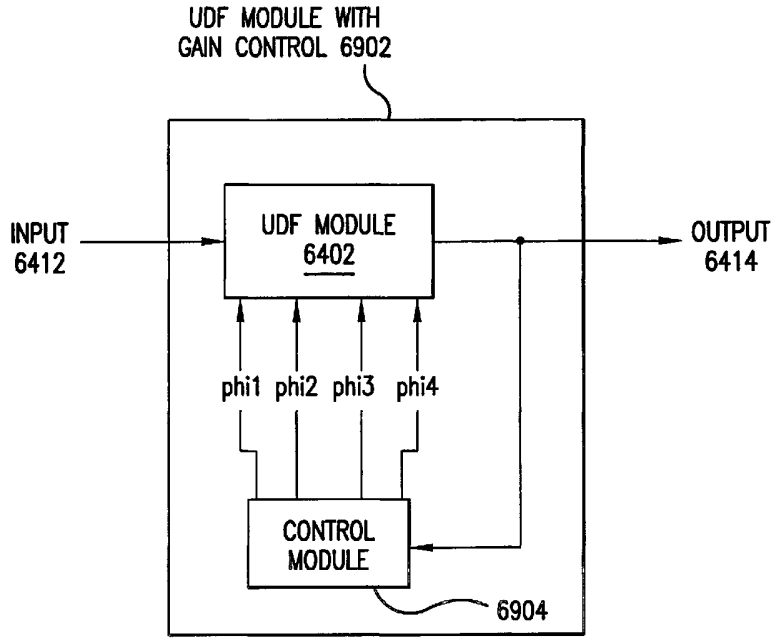
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
16 October 2003

[Continued on next page]

(54) Title: INTEGRATED FREQUENCY TRANSLATION AND SELECTIVITY WITH GAIN CONTROL FUNCTIONALITY, AND APPLICATIONS THEREOF



(57) Abstract: Methods and apparatuses for frequency selectivity and frequency translation, and applications for such methods and apparatuses, are described herein. The method includes steps of filtering an input signal, and down-converting the filtered input signal. The filtering and the down-conversion operations are performed in an integrated, unified manner. The apparatus described herein can be implemented as an integrated circuit (IC). The apparatus may include a module or modules for gain control.

WO 01/071906 A3

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.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/08969

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H03D7/00

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)
IPC 7 H03D

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 practical, 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	EP 0 632 577 A (FORD CO) 4 January 1995 (1995-01-04) column 3, line 45 -column 5, line 23; figures 1,2,5	1-5
X	EP 0 254 844 A (TEKTRONIX INC) 3 February 1988 (1988-02-03) column 2, line 46 -column 4, line 8 column 4, line 45 - line 51; figure 1	1-5
X	US 5 633 815 A (W. YOUNG) 27 May 1997 (1997-05-27) column 3, line 13 -column 5, line 34; figures 3,4	1-5

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 July 2002	06/08/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Butler, N

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 39750 A (LELAND STANFORD UNIV.) 12 December 1996 (1996-12-12) page 7, line 12 -page 13, line 18; figures 4,5	6-18
X	US 5 801 654 A (K. TRAYLOR) 1 September 1998 (1998-09-01) column 2, line 49 -column 7, line 10; figures 1-7	6-18
X	US 4 888 557 A (C. PUCKETTE) 19 December 1989 (1989-12-19) column 3, line 50 -column 6, line 65; figure 1	6
X	WO 96 02977 A (STANFORD COMMUNICATIONS INC) 1 February 1996 (1996-02-01) page 7, line 8 -page 8, line 3; figure 3 figures 4-6	6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/08969

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 632577 A	04-01-1995	US 5490173 A	06-02-1996
		DE 69421761 D1	30-12-1999
		DE 69421761 T2	21-06-2000
		EP 0632577 A1	04-01-1995
		JP 7154152 A	16-06-1995
EP 254844 A	03-02-1988	US 4791600 A	13-12-1988
		DE 3766179 D1	20-12-1990
		EP 0254844 A2	03-02-1988
		JP 63037741 A	18-02-1988
US 5633815 A	27-05-1997	US 5493581 A	20-02-1996
		US 5570392 A	29-10-1996
		US 5617344 A	01-04-1997
		US 5757794 A	26-05-1998
WO 9639750 A	12-12-1996	US 5640698 A	17-06-1997
		AT 192000 T	15-05-2000
		AU 700076 B2	17-12-1998
		AU 6096196 A	24-12-1996
		DE 69607836 D1	25-05-2000
		DE 69607836 T2	19-10-2000
		DK 813770 T3	31-07-2000
		EP 0813770 A1	29-12-1997
		ES 2148767 T3	16-10-2000
		WO 9639750 A1	12-12-1996
US 5801654 A	01-09-1998	CA 2140437 A1	05-01-1995
		EP 0656161 A1	07-06-1995
		GB 2284955 A	21-06-1995
		JP 8501428 T	13-02-1996
		KR 174781 B1	01-04-1999
		WO 9501006 A1	05-01-1995
US 4888557 A	19-12-1989	GB 2230394 A	17-10-1990
		JP 2288641 A	28-11-1990
WO 9602977 A	01-02-1996	AU 3000295 A	16-02-1996
		WO 9602977 A1	01-02-1996