



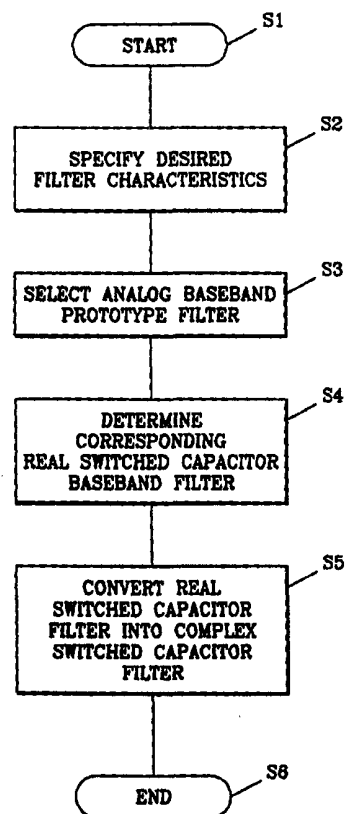
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H03H 19/80</p>	<p>A3</p>	<p>(11) International Publication Number: WO 99/00899 (43) International Publication Date: 7 January 1999 (07.01.99)</p>
<p>(21) International Application Number: PCT/SE98/01263 (22) International Filing Date: 26 June 1998 (26.06.98) (30) Priority Data: 9702492-1 27 June 1997 (27.06.97) SE (71) Applicant: TELEFONAKTIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stockholm (SE). (72) Inventors: SCHIER, Thorsten; Valkyriavägen 13 b.v., S-174 55 Sundbyberg (SE). SIGNELL, Svante; Ångsullsvägen 170, S-162 46 Vällingby (SE). (74) Agents: HEDMAN, Anders et al.; Dr. Ludwig Brann Patentbyrå AB, P.O. Box 1344, S-751 43 Uppsala (SE).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 18 March 1999 (18.03.99)</p>	

(54) Title: COMPLEX SWITCHED CAPACITOR FILTER AND DESIGNING METHOD FOR SUCH A FILTER

(57) Abstract

A complex switched capacitor filter is formed by selecting (S3) an analog baseband prototype filter with the desired filter characteristics (S2). This prototype is converted (S4) into a corresponding real switched capacitor filter, and finally the real switched capacitor filter is converted (S5) into a complex switched capacitor filter by replacing each element of real filter by a frequency shifted complex counterpart.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/01263

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H03H 19/80

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)

IPC6: H03H

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

SE,DK,FI,NO classes as above

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

CLAIMS, WPI, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	1986 IEEE International Symposium on Circuits and Systems, Volume 3, No 3, May 1986, QINGLI LIU. ET AL, "Switched-Capacitor Implementation of Complex Filters" page 1121 - page 1124	1,2,4,6-9
A	--	3,5
X	1997 IEEE International Solid-State Circuits Conference, Volume 40, February 1997, STEPHEN JANTZI ET AL, "A Quadrature Bandpass $\Sigma\Delta$ Modulator for Digital Radio" page 216 - page 217; page 460	7,8
Y	--	1-6,9

 Further documents are listed in the continuation of Box C. 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

"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

23 December 1998

Date of mailing of the international search report

11-01-1999

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Bo Gustavsson

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/01263

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	IEICE Transactions., Volume E 74, No 12, December 1991, HIROSHI IWAKURA ET AL, "Design of Complex Digital Filters Using Frequency Transformation" page 3930 - page 3934 --	1-6,9
A	US 4210872 A (ROUBIK GREGORIAN), 1 July 1980 (01.07.80), column 2, line 5 - line 48; column 5, line 55 - column 7, line 11 --	1,2,7
A	US 4924189 A (PATRICE SENN ET AL), 8 May 1990 (08.05.90), see the whole document -- -----	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/12/98

International application No.

PCT/SE 98/01263

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4210872 A	01/07/80	CA 1113553 A	01/12/81
		DE 2926900 A,C	20/03/80
		FR 2435856 A,B	04/04/80
		GB 2030409 A,B	02/04/80
		JP 1491589 C	07/04/89
		JP 55038796 A	18/03/80
		JP 63036580 B	20/07/88
		NL 184498 B,C	01/03/89
		NL 7904161 A	11/03/80
US 4924189 A	08/05/90	DE 3866483 A	09/01/92
		EP 0307275 A,B	15/03/89
		FR 2619974 A,B	03/03/89
		JP 1144717 A	07/06/89