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(54) **Title:** ACCESS POINT WITH SIMULTANEOUS DOWNLINK TRANSMISSION OF INDEPENDENT DATA FOR MULTIPLE CLIENT STATIONS

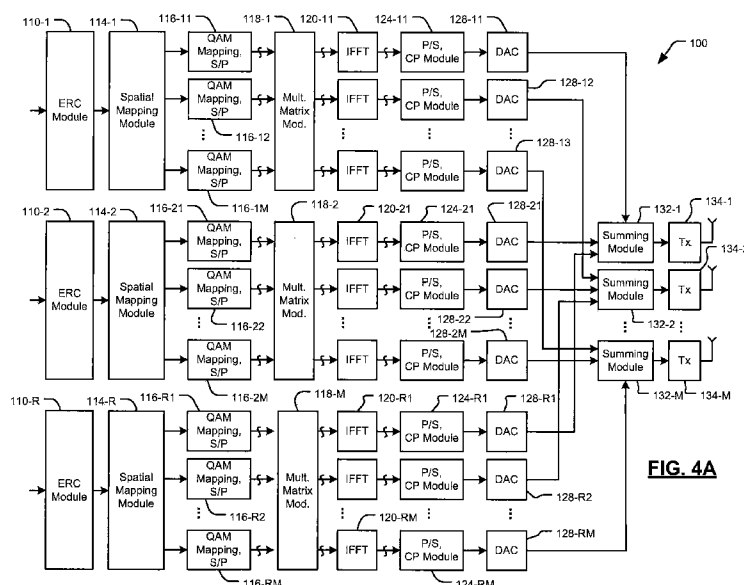


FIG. 4A

(57) **Abstract:** A wireless network device comprises R modulation modules that receive R independent data streams, that modulate the R independent data streams, and that apply a multiplexing matrix to generate M modulated and multiplexed data streams, respectively, where R and M are integers greater than one. M summing modules sum portions of each of the M modulated and multiplexed data streams to generate M transmit data streams. M transmitters simultaneously transmit the M transmit data streams during a simultaneous downlink transmission (SDT) period.



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B. FIELDS SEARCHED

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

EPO-Internal, WPI Data, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/041300 A (QUALCOMM INC [US]) 15 May 2003 (2003-05-15) paragraph [1052] - paragraph [1105]; figures 2B-3E	1-30
X	EP 1 598 975 A (SAMSUNG ELECTRONICS CO LTD [KR]; KOREA INST SCIENCE TECHNOLOGY [KR]) 23 November 2005 (2005-11-23) figures 1,2 page 2 - page 4 page 10 - page 19 ----- -/--	1,2,5,6, 16,17, 20,21

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

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/086400 A1 (SHIDA MASAOKI [JP] ET AL) 19 April 2007 (2007-04-19) page 2 - page 11; figures 1,3,13 page 17 page 46 - page 52 -----	1,2,4-6, 13,16, 17, 19-21,28
X	EP 1 357 693 A (IMEC INTER UNI MICRO ELECTR [BE]) 29 October 2003 (2003-10-29) page 55 - page 56; figure 4 page 62 -----	1,2,5,7, 11,13, 14,16, 17,20, 22,26, 28,29
A	US 2006/250938 A1 (KHAN FAROOQ [US] ET AL) 9 November 2006 (2006-11-09) page 2 - page 4; figure 2 page 20 - page 36 -----	1-30

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/070466

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03041300	A	15-05-2003	BR 0213913 A 26-04-2005
			CN 1613201 A 04-05-2005
			EP 1442538 A1 04-08-2004
			JP 2005509360 T 07-04-2005
			KR 20050043783 A 11-05-2005
			TW 269549 B 21-12-2006
			US 2006121946 A1 08-06-2006
			US 2003125040 A1 03-07-2003
EP 1598975	A	23-11-2005	KR 20050109863 A 22-11-2005
			US 2005254457 A1 17-11-2005
US 2007086400	A1	19-04-2007	CN 1949679 A 18-04-2007
			JP 2007110456 A 26-04-2007
			KR 20070041309 A 18-04-2007
EP 1357693	A	29-10-2003	NONE
US 2006250938	A1	09-11-2006	NONE