(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 041 758 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
03.03.2004 Bulletin 2004/10

(43) Date of publication A2:
04.10.2000 Bulletin 2000/40

(21) Application number: **00105296.8**

(22) Date of filing: **14.03.2000**

(51) Int Cl.[7]: **H04H 3/00**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **31.03.1999 US 282652**

(71) Applicant: **HARRIS CORPORATION**
Melbourne Florida 32919 (US)

(72) Inventors:
- **Rollins, William**
  Wrentham MA 02093 (US)
- **Kim, Junius**
  Boxoborough, MA 01719 (US)

(74) Representative: **Fleuchaus, Leo, Dipl.-Ing. et al**
Fleuchaus & Gallo
Melchiorstrasse 42
81479 München (DE)

(54) Method and system for extending broadcast coverage on a single frequency network

(57) A system for aligning the phase characteristics of N identical digitized audio program signals distributed from a studio to N broadcasting stations via N time division multiplex (TDM) communication signals includes N TDM multiplexers, each of which (i) multiplexes a digitized audio program signal into at least one channel of a TDM communication link established between the studio and one of the N broadcasting stations, and (ii) multiplexes a timing signal into another channel of the TDM communication signal. A TDM de-multiplexer at each of the broadcasting stations extracts the digitized audio program signal and the timing signal from the corresponding TDM communication signal. A timing signal comparator compares the extracted timing signal to a local timing signal that is delayed by a precise and adjustable amount, and produces an offset time corresponding to the comparison result. The delay adjust circuit dynamically adjusts the delay of the TDM signal as a function of the offset time, preferably so as to drive the offset time to substantially zero. The timing signal at the studio and the timing signals at each of the broadcast stations are provided by an existing time distribution network.

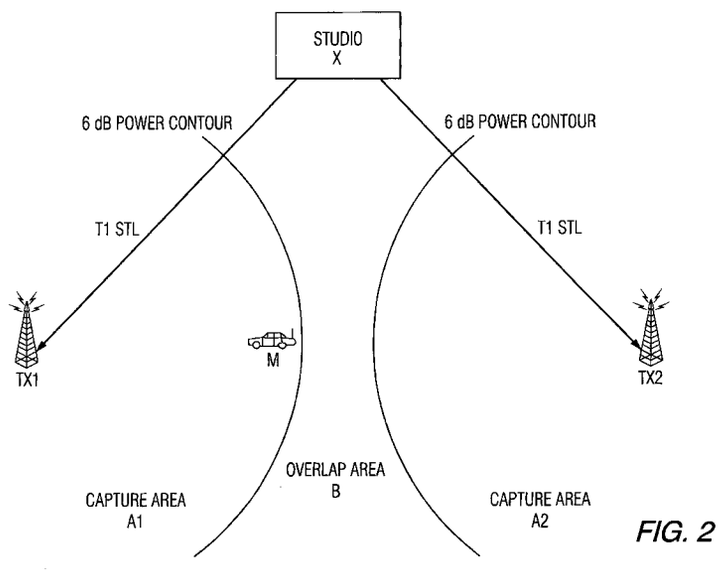

FIG. 2

EP 1 041 758 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 5296

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 97 20404 A (ERICSSON GE MOBILE INC) 5 June 1997 (1997-06-05) * page 1, line 1 - page 16, line 5; figures 1,2 *	1-10	H04H3/00
A	EP 0 515 214 A (BRITISH TELECOMM) 25 November 1992 (1992-11-25) * the whole document *	1-10	
A	US 5 822 324 A (KOSTRESTI BRUCE ET AL) 13 October 1998 (1998-10-13) * column 1, line 20 - column 7, line 25 * * column 18, line 31 - column 19, line 16 *	1-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 January 2004	van Hoorick, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 5296

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-01-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9720404 A	05-06-1997	US 6011977 A	04-01-2000
		AU 1086497 A	19-06-1997
		WO 9720404 A1	05-06-1997
EP 0515214 A	25-11-1992	AT 157824 T	15-09-1997
		AU 1791892 A	30-12-1992
		CA 2103442 A1	25-11-1992
		DE 69221938 D1	09-10-1997
		DE 69221938 T2	05-02-1998
		DK 515214 T3	14-04-1998
		EP 0515214 A1	25-11-1992
		EP 0586434 A1	16-03-1994
		ES 2107504 T3	01-12-1997
		WO 9221184 A1	26-11-1992
		HK 1002944 A1	25-09-1998
		IE 921666 A1	02-12-1992
		IN 182881 A1	31-07-1999
		JP 6508727 T	29-09-1994
		NZ 242860 A	25-11-1994
		SG 47685 A1	17-04-1998
		US 5483677 A	09-01-1996
		ZA 9203760 A	27-01-1993
US 5822324 A	13-10-1998	US 5729549 A	17-03-1998
		US 5651010 A	22-07-1997
		AU 5424696 A	02-10-1996
		WO 9628904 A1	19-09-1996
		AU 5424496 A	02-10-1996
		WO 9628903 A1	19-09-1996
		US 5751707 A	12-05-1998
		US 6130898 A	10-10-2000
		AU 5365496 A	02-10-1996
		AU 5424796 A	02-10-1996
		AU 5424896 A	02-10-1996
		AU 5424996 A	02-10-1996
		AU 5425096 A	02-10-1996
		AU 5425296 A	02-10-1996
		WO 9628905 A1	19-09-1996
		WO 9628906 A1	19-09-1996
		WO 9628902 A1	19-09-1996
		WO 9628908 A1	19-09-1996
		WO 9628909 A1	19-09-1996
		WO 9628910 A1	19-09-1996
		US 5646942 A	08-07-1997
		US 5559808 A	24-09-1996
		US 5610916 A	11-03-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 5296

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-01-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5822324 A		US 5666365 A	09-09-1997
		US 5852612 A	22-12-1998

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82