

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

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| To:<br><br><p style="text-align: center;">see form PCT/ISA/220</p>  | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">                     REC'D 22 MAY 2006 PCT                 </div> <p style="text-align: center; font-weight: bold;">WRITTEN OPINION OF THE<br/>INTERNATIONAL SEARCHING AUTHORITY<br/>(PCT Rule 43bis.1)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                     Date of mailing<br/>(day/month/year) see form PCT/ISA/210 (second sheet)                 </div> |  |
| Applicant's or agent's file reference<br>see form PCT/ISA/220   | <b>FOR FURTHER ACTION</b><br>See paragraph 2 below  |  |
| International application No.<br>PCT/US2006/003853  | International filing date (day/month/year)<br>02.02.2006  | Priority date (day/month/year)<br>29.06.2005                             |
| International Patent Classification (IPC) or both national classification and IPC<br>INV. H04L25/493  |   |  |
| Applicant<br>APPLE COMPUTER, INC.   |   |  |
| <p>1. This opinion contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul> <p>2. <b>FURTHER ACTION</b></p> <p>If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.</p> <p>If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.</p> <p>For further options, see Form PCT/ISA/220.</p> <p>3. For further details, see notes to Form PCT/ISA/220.</p> |   |  |
| Name and mailing address of the ISA:<br><br>European Patent Office - P.B. 5818 Patentlaan 2<br>NL-2280 HV Rijswijk - Pays Bas<br>Tel. +31 70 340 - 2040 Tx: 31 651 epo nl<br>Fax: +31 70 340 - 3016   | Date of completion of<br>this opinion<br><br>see form<br>PCT/ISA/210  | Authorized Officer<br><br>Litton, R<br><br>Telephone No. +31 70 340-4516 |



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2006/003853

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:

- the international application in the language in which it was filed
- a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material:

- a sequence listing
- table(s) related to the sequence listing

b. format of material:

- on paper
- in electronic form

c. time of filing/furnishing:

- contained in the international application as filed.
- filed together with the international application in electronic form.
- furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

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|-------------------------------|-------------|------------------------|
| Novelty (N)                   | Yes: Claims | 2,5-7,9,12-14,16,19-21 |
|                               | No: Claims  | 1,3,4,8,10,11,15,17,18 |
| Inventive step (IS)           | Yes: Claims |                        |
|                               | No: Claims  | 1-21                   |
| Industrial applicability (IA) | Yes: Claims | 1-21                   |
|                               | No: Claims  |                        |

2. Citations and explanations

**see separate sheet**

1. The following documents, D1 and D2, are referred to in this opinion; the numbering will be adhered to in the rest of the procedure:

D1: US-A-3 883 687 (STENSTROM ET AL) 13 May 1975

D2: US-A-6 047 026 (CHAO ET AL) 4 April 2000

D3: US 2005/117668 A1 (TANG CHENG-MING ET AL) 2 June 2005

### **Re Item V.**

2. Independant claims 1, 8 and 15 do not meet the requirements of Article 33(1) PCT, because the subject matter is not new in the sense of Article 33(2) PCT and Rule 64(1) PCT.

2.1 Document D1 discloses (*references in parentheses apply to D1*), "A method for receiving data on a channel (col. 1, lines 29&30), comprising: examining a state of a bit that was previously received on the channel; if the state of the previously received bit was high, looking for a falling edge while receiving a subsequent bit on the channel; and otherwise, looking for a rising edge while receiving the subsequent bit on the channel (col. 1, lines 31-35)"

As D1 discloses a method of determining the order of the transitions, it is implicit that the method would comprise looking for a rising edge if the current state is low and vice versa. Thus, the subject-matter of claim 1 is not novel with respect to D1.

2.2 Same arguments apply, *mutatis mutandis*, to independent claims 8 and 15.

3. Dependant claims 3, 4, 10, 11, 17 and 18 do not meet the requirements of Article 33(1) PCT, because the subject matter is not new in the sense of Article 33(2) PCT and Rule 64(1) PCT.

3.1 Claim 3 contains the additional feature that the received signal is sampled at a plurality of discrete time steps, the receiver detects at which time step the transition occurs, if at all, and decodes the received information for the received signal based on whether or not there was a transition, and during which time step that transition occurred. This feature is disclosed in D1, col. 1, lines 3-28 and fig. 1a&1b.

Thus, the subject-matter of claim 3 is not novel with respect to D1.

3.2 Same arguments apply, mutatis mutandis, to claims 10 and 17.

3.3 Claim 4 contains the additional feature that the output symbol is a bit pattern. This feature is disclosed in D1, col. 2, lines 37-43.

Thus, the subject-matter of claim 4 is not novel with respect to D1.

3.4 Same arguments apply, mutatis mutandis, to claims 11 and 18.

4. Dependant claims 2, 5-7, 9, 12-14, 16 and 19-21 do not meet the requirements of Article 33(1) PCT, because the subject matter is not inventive in the sense of Article 33(3) PCT and Rule 64(1) PCT.

4.1 Claim 2 contains the additional feature that the rising edge and falling edges are detected using different reference voltages.

The objective problem can be phrased as "How to provide a more accurate indication of a transition?"

The technique of hysteresis is well-known in the area of data communications and in particular in the area of decision-making. This technique is disclosed in D2, col. 2.

As both D1 and D2 are in the same technical field, that of bit detection, the person skilled in the art would have been aware of the technique of using different reference levels to accurately detect transitions.

The person skilled in the art would have been motivated to combine the teachings from the two documents to achieve a result which would solve the objective problem posed.

Thus, the subject-matter of claim 2 is not inventive with respect to D1 and D2.

4.2 Same arguments apply, mutatis mutandis, to claims 9 and 16.

4.3 Claim 5 contains the additional feature that the signal which is received using the method of claim 3 is encoded by using the state of a previously transmitted bit and the current information to be encoded. Based on a previous bit state (high or low) a "high" look up table or a "low" look up table is used to determine at which time step the transition should occur, if at all, to represent the information to be encoded.

The objective problem may be posed as "How to ensure the correct transition (i.e. positive-going or negative-going) during the encoding of a bit sequence?"

D2 discloses using a "high" or "low" look up table to encode a bit sequence dependent on the collective previous bit states in paragraph 7 and paragraphs 17&18.

Again, both D1 and D3 are in the same technical fields, and the person skilled in the art would have been aware of the teachings of D3.

The person skilled in the art would have considered the obvious design option of amending the teachings of D3 so that the choice of using either the "high" or "low" look-up table is made based on just the last bit value (as would occur at the encoding of the 2nd bit).

Motivated by the objective problem, the person skilled in the art would have considered employing the amended teachings of D3 to D1 to arrive at the desired solution.

Thus, the subject-matter of claim 5 is not inventive with respect to D1 and D3.

4.4 Same arguments apply, mutatis mutandis, to claims 12 and 19.

4.5 Claim 6 contains the additional feature that there is a minimum period between transitions. This is considered as a mere design feature which would be obvious to the person skilled in the art when constructing the method.

Thus, the subject-matter of claim 6 is not inventive with respect to D1 and D3.

4.6 Same arguments apply, mutatis mutandis, to claims 13 and 20.

4.7 Claim 7 contains the additional feature that the method uses a variable-delay circuit. This is merely a straight-forward design option open to the person skilled in the art. Thus, the subject-matter of claim 7 is not inventive with respect to D1 and D3.

4.8 Same arguments apply, mutatis mutandis, to claims 14 and 21.