**Title**: A METHOD AND SYSTEM FOR FREE-SPACE COMMUNICATION

---

**Abstract**: Optical signals emanating from the tip of an optical communication fiber can be converted, using a non-linear crystal, to signals (carrier waves) whose wavelength fall in the range of far infra-red to RF. These longer wavelength converted signals maintain the modulation of the original data. Dense fog is inherently opaque to near infra-red waves used in fiber optics communications and relatively transparent to these longer wavelengths. The modulated long wave radiation can, therefore, serve to transmit data from a fiber tip through free space under foggy (and possibly other) prevailing weather conditions. The original optical wave may be recovered by reconverts the received long wave radiation in a heterodyning process taken place in a non-linear crystal with continuous wave laser radiation of an appropriate wave length. Consequently, fiber optics communications networks can be inter-connected seamlessly through a far infra-red/RF free space link.
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

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B7/10

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 H04B

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)

EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>WO 01 52450 A (LIGHTPOINTE COMMUNICATIONS INC) 19 July 2001 (2001-07-19) cited in the application page 6, line 3 - page 8, line 28</td>
<td>1-27, 34</td>
</tr>
<tr>
<td>P, X</td>
<td>EP 1 237 303 A (CIT ALCATEL) 4 September 2002 (2002-09-04) column 5, line 4 - line 56 figure 3</td>
<td>10, 34</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of box C.

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.

**A** document member of the same patent family

Date of the actual completion of the international search: 14 April 2003

Date of mailing of the international search report: 23/04/2003

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HJ Pufftijk Tel. (+31-70) 340-2040, Tx 31 651 epi nl, Fax (+31-70) 340-3016

Authorized officer

Larcinese, A

Form PCT/ISA/210 (second sheet) (July 1992)
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BR 0016964 A</td>
<td>15-10-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1249084 A2</td>
<td>16-10-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0152450 A2</td>
<td>19-07-2001</td>
</tr>
<tr>
<td>EP 1237303</td>
<td>04-09-2002</td>
<td>IT MI20010414 A1</td>
<td>02-09-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1237303 A2</td>
<td>04-09-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2002122231 A1</td>
<td>05-09-2002</td>
</tr>
</tbody>
</table>