

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| (51) International Patent Classification <sup>6</sup> :<br><b>H04N 11/04, 7/32</b>                                                                                |  | <b>A2</b>                                                                                                                                                                                                                                                                                                                                                                                                                    | (11) International Publication Number: <b>WO 96/25010</b>             |
|                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                              | (43) International Publication Date: <b>15 August 1996 (15.08.96)</b> |
| (21) International Application Number: <b>PCT/IB96/00062</b>                                                                                                      |  | (81) Designated States: AL, AM, AU, BB, BG, BR, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KP, KR, LK, LR, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AZ, BY, KG, KZ, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, 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). |                                                                       |
| (22) International Filing Date: <b>26 January 1996 (26.01.96)</b>                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |
| (30) Priority Data:<br>9502172.1 ✓ 3 February 1995 (03.02.95) GB<br>9503063.1 ✓ 16 February 1995 (16.02.95) GB                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |
| (71) Applicant: PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).                                                                   |  | <b>Published</b><br><i>Without international search report and to be republished upon receipt of that report.</i><br><i>549611564-4</i>                                                                                                                                                                                                                                                                                      |                                                                       |
| (71) Applicant (for SE only): PHILIPS NORDEN AB [SE/SE]; Kottbygatan 5, Kista, S-164 85 Stockholm (SE).                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |
| (72) Inventors: PENNA, David, Edward; 129 Carlton Road, Redhill, Surrey RH1 2DE (GB). HOSKINS, Asher, John; 27 Furzefield Crescent, Reigate, Surrey RH2 7HQ (GB). |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |
| (74) Agent: WHITE, Andrew, Gordon; Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                       |

(54) Title: VIDEO IMAGE COLOUR ENCODING

## (57) Abstract

A method is described of encoding pixel colour values for a digital video image frame in which each different colour within the image is assigned a colour value. A predominant colour is identified for the image frame and, in a first embodiment, each pixel having a colour other than the predominant colour is separately coded as its respective colour value (0010 to 1111), with runs of three or more successive pixels of the predominant colour being run-length encoded. A further code (0000 0011 cccc), similar in arrangement to that indicating a run, is provided to allow a change in the specified predominant colour during the course of a frame. In a further embodiment, runs of all colours are run-length encoded but with a shorter coding scheme for runs of the predominant colour or, in a still further embodiment, a small range of predominant colours. A principle use for these coding schemes is to improve efficiency of coding for certain classes of image material.

| CODE              | NIBBLE 1 | NIBBLE 2 | NIBBLE 3 | NIBBLE 4 | RUN LENGTH       |
|-------------------|----------|----------|----------|----------|------------------|
| SINGLE            | 0001     | -        | -        | -        | 1 PIXEL          |
| SINGLE +          | 0001     | 0001     | -        | -        | 2 PIXELS         |
| SHORT             | 0000     | 0100     | -        | -        | 3 PIXELS TO      |
|                   | 0000     | 1111     | -        | -        | 14 PIXELS        |
| SHORT +           | 0000     | 1111     | 0001     | -        | 15 PIXELS        |
| MEDIUM            | 0000     | 0000     | 0001     | -        | 16 PIXELS TO     |
|                   | 0000     | 0000     | 1111     | -        | 30 PIXELS        |
| LONG              | 0000     | 0001     | 0000     | -        | 31 PIXELS TO     |
|                   | 0000     | 0001     | 1111     | -        | 46 PIXELS        |
| LONGER            | 0000     | 0010     | 0000     | 0000     | 47 PIXELS TO 302 |
|                   | 0000     | 0010     | 1111     | 1111     | PIXELS           |
| CHANGE BACKGROUND | 0000     | 0011     | cccc     | -        | -                |

cccc = 0010 to 1111

**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.

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