INTERNATIONAL STANDARD

IEC 61880-2

First edition
2002-09

Video systems (525/60) – Video and accompanied data using the vertical blanking interval – Analogue interface –

Part 2: 525 progressive scan system

Reference number
IEC 61880-2:2002(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site (www.iec.ch)**

- **Catalogue of IEC publications**

  The on-line catalogue on the IEC web site (http://www.iec.ch/searchpub/cur_fut.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

  This summary of recently issued publications (http://www.iec.ch/online_news/justpub/jp_entry.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

  If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

  Email: custserv@iec.ch
  Tel: +41 22 919 02 11
  Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC 61880-2

First edition
2002-09

Video systems (525/60) – Video and accompanied data using the vertical blanking interval – Analogue interface –

Part 2: 525 progressive scan system

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE L

For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

VIDEO SYSTEMS (525/60) – VIDEO AND ACCOMPANIED DATA USING THE VERTICAL BLANKING INTERVAL – ANALOGUE INTERFACE

Part 2: 525 progressive scan system

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61880-2 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/444/CDV	100/502/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

VIDEO SYSTEMS (525/60) – VIDEO AND ACCOMPANIED DATA USING THE VERTICAL BLANKING INTERVAL – ANALOGUE INTERFACE –

Part 2: 525 progressive scan system

1 Scope

This part of IEC 61880 specifies the aspect ratio code and the copy control information code and the method of transfer of these codes in the vertical blanking interval of the luminance signal. It is applicable to the transfer of video related information with the video signal through the baseband analogue signal of the 525-line/60-frame progressive scan video system.

This standard is applicable to analogue video signal interfaces between digital and analogue video equipment as follows:

– digital video equipment to digital video equipment;
– digital video equipment to analogue video equipment;
– analogue video equipment to digital video equipment;
– analogue video equipment to analogue video equipment.

2 Definitions and abbreviations

For the purposes of this document the following definitions and abbreviations apply.

2.1
CRCC
cyclic redundancy check code for error detection

2.2
CGMS-A
copy generation management system on analogue video interface, for use in digital video recorders and players

2.3
APS
analogue protection system, to control analogue copying from digital transmission or from digital copies of a video signal

2.4
IRE
linear scale for measuring the relative amplitude of the video signal with a reference at the blanking level, in which pure white is defined as 100 IRE and the blanking level is 0 IRE.

NOTE IRE is the abbreviation for the Institute of Radio Engineers.

3 Construction of identification signal

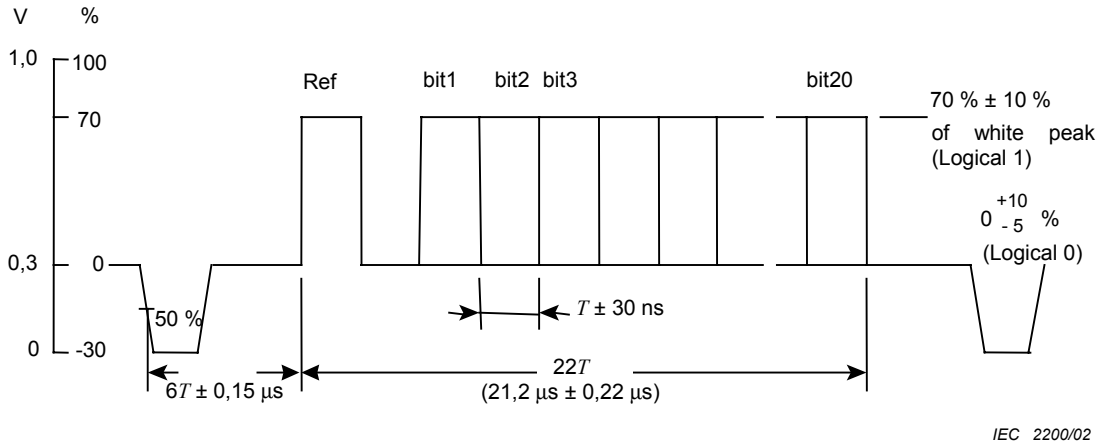
The identification signal consists of a reference signal of 70 % (70-IRE) and a 20-bit digital data signal indicated by 0 % (0-IRE) or 70 % (70-IRE) in the effective video signal period of one horizontal line. The signal waveform is shown in Figure 1. The 20-bit digital data signal is coded as an identification signal for video related information.

The identification signal is inserted in the horizontal line 41 of luminance signal (Y signal) for the 525-line/60-frame progressive scan video system. The signal inserted line is shown in Figure 2.

The clock frequency (f_c) of the 525-line/60-frame system shall be:

$$f_c = f_h \cdot 33 = 1{,}0385 \text{ MHz}$$

where f_h = 31,468 kHz (horizontal scan frequency)



$$T = \frac{1}{(f_h \times 33)} = 963 \text{ ns}$$

NOTE The cumulative timing error for each bit number 1 to bit number 20, measured from the 50 % amplitude point of the rising edge of the reference bit, should be within 0,22 µs.

Figure 1 – Identification signal waveform

Logical 1 to be transmitted is represented by 70 % (70-IRE) and logical 0 to be transmitted is represented by 0 % (0-IRE) in the effective video signal.

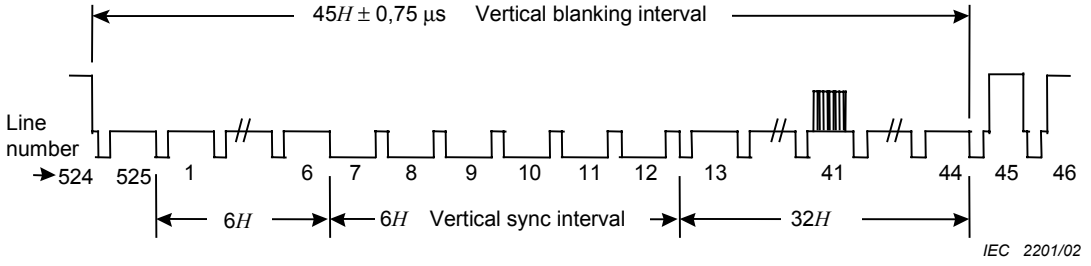


Figure 2 – Signal inserted line in vertical blanking interval

4 Bit and code assignment of the identification signal

4.1 General

The 20-bit digital data signal consists of WORD-0 (2 bits), WORD-1 (4 bits), WORD-2 (8 bits) and CRCC (6 bits), as illustrated in Figure 3.

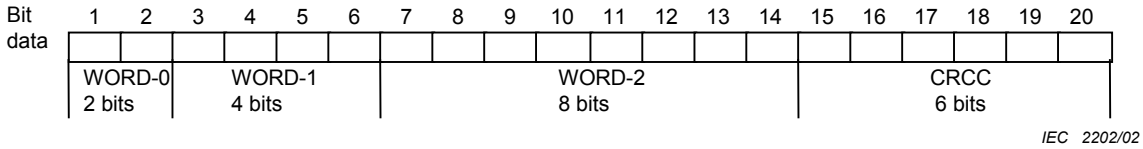


Figure 3 – Identification data format

4.2 WORD-0: Identification data for the video information signal

The WORD-0 code assignments that identify the picture aspect ratio and display format are specified in Table 1.

Table 1 – Aspect ratio and display format

Bit number 1	Bit number 2	Applications		Remarks
		Aspect ratio	Picture display format	
0	0	4:3	Normal	See Annex A
1	0	16:9	Normal	
0	1	4:3	Letter box	
1	1	Reserved		

If the aspect ratio information is not indicated, bit assignments of WORD-0 shall be 00.

Bit assignment 11 is reserved for a future application.

4.3 WORD-1 and WORD-2

Code assignments for WORD-1 and WORD-2 are specified in Annex B. WORD-1 is the header code which indicates the meaning of the data in WORD-2.

Non-specified code assignments in WORD-2 shall be set to 0.

Non-specified bit combinations shall be ignored by the receiving equipment, and the receiving equipment shall interpret only the bit combinations which can be handled by the receiving equipment.

4.4 CRCC

CRCC is the error check code. The generator polynomial $G(X)$ of the CRCC is as shown in the following formula (see Figure 4):

$$G(X) = X^6 + X + 1$$

Preset of CRCC in Figure 4 shall be all 1.

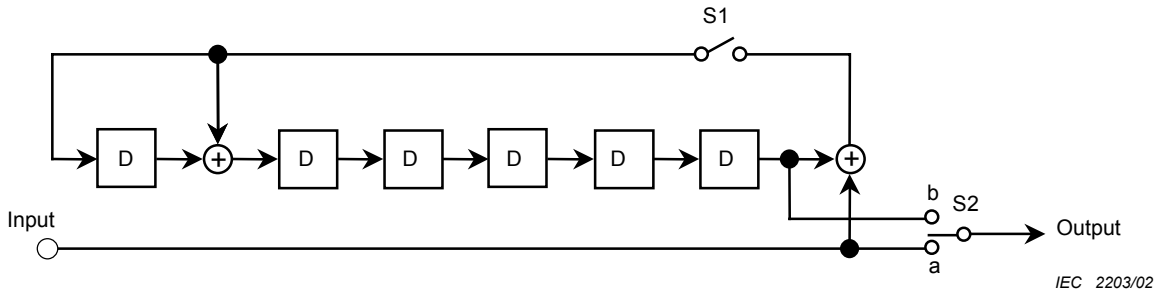


Figure 4 – CRCC generator

The CRCC is generated in successive steps as follows:

1) S1 is closed, and S2 is set to position a;
2) 14 bits data are input from the beginning;
3) S1 is opened, S2 set to position b, and CRCC is output from bit number 15.

5 Transmission frame

The same data shall be carried on every frame.

6 Designation

The equipment which deals with the data of this standard shall use the designation ID-2. The name of this information system is defined as VIDEO ID.

Annex A
(normative)

Aspect ratio and picture display format

A.1 Aspect ratio

The meaning of aspect ratio as specified in 4.2 is as follows (see Figure A.1):

– aspect ratio 4:3 means that pictures are captured at an aspect ratio 4:3, and converted into a video signal;

– aspect ratio 16:9 means that pictures are captured at an aspect ratio of 16:9, and compressed to a ratio of 4:3. Then the compressed pictures are converted into a video signal.

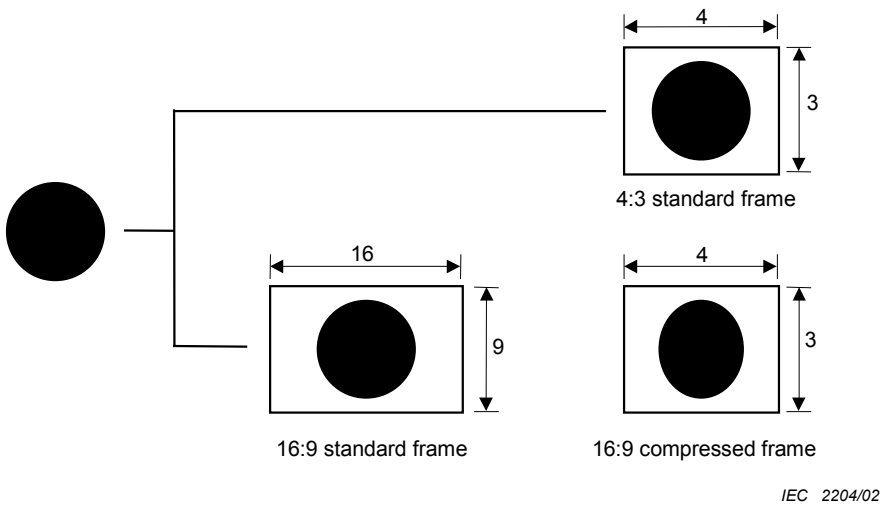


Figure A.1 - Aspect ratio

A.2 Picture display format

The meaning of picture display format as specified in 4.2 is illustrated in Figure A.2.

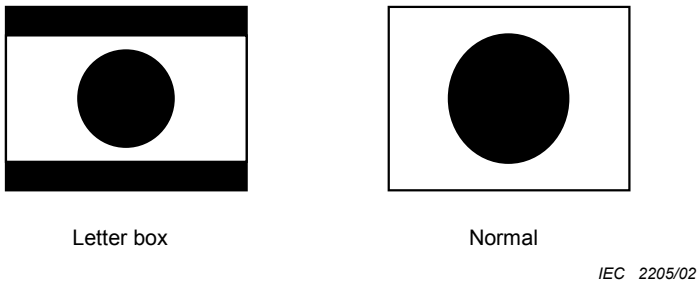


Figure A.2 - Picture display format

Annex B
(normative)

Copy control information system

B.1 Copy control information

The copy control information signal is transmitted between video recorders and/or video players in the data of WORD- 2 when WORD-1 in the 20-bit identification data format is set to 0000 (see Table B.1).

When the code 0000 is present in WORD-1, the data of WORD-2 shall be transferred by the rate of two or more frames per 2 s.

Table B.1 – Bit assignment of WORD-1

Bit number of WORD-1 3 4 5 6	Application of WORD-2	Data form
0000	Copy control information	Flags (see Table B.2)

The copy control information is specified as follows:

a) CGMS-A: copy generation management system in an analogue signal for use in video recorders and players.

   CGMS-A consists of two bits of digital information;

b) APS trigger bits: identification bits for triggering generation of a pseudo-sync (PSP) and an inverted split colour burst element;

c) analogue source bit: copy control information to indicate whether the source of the incoming video signal originated from an analogue pre-recorded medium

When copyright information is not to be transferred, WORD-1 shall be set to the default value 1111.

B.2 CGMS-A

The CGMS-A signal consists of bit number 7 and bit number 8 of WORD-2 in the 20-bit identification data format.

Table B.2 – CGMS-A

Bit number of WORD 2	Applications	Contents
7	Copyright	See Table B.3
8	Copy generation bit	

Bit number 7 of CGMS-A information identifies whether copyright is being asserted via CGMS-A. Bit number 8 of CGMS-A information identifies whether, in the light of the status of the bit number 7, copying of the video signal is to be permitted.

The bit assignment of bit number 7 and bit number 8 shall be as specified in Table B.3.

Table B.3 – Bit assignment of CGMS-A

Bit number	State	Applications
7	1	Copyright subsists and copyright is being asserted via CGMS-A
	0	No copyright subsists or copying is not being restricted via CGMS-A, or status unknown
8	1	Not to be time shifted or status unknown If bit number 7 is 1 then no copying is permitted
	0	To be time-shifted or copying is permitted

The specifications of the conditions under which copying of the video signal is permitted or inhibited, as determined by the status of the bit number 7 and the bit number 8 of CGMS-A information are given below:

Bit number: 7, 8

0, 0 Copying is permitted without restriction

0, 1 Condition not be used

1, 0 One generation of copies may be made

1, 1 No copying is permitted

B.3 APS trigger bit

The APS consists of two basic elements, i.e. a pseudo-sync pulse (PSP) element and an inverted split colour burst element.

The APS trigger bits consist of bits 9 and 10 of WORD-2 in the 20-bit identification data format.

The bit assignment of APS trigger bits is specified in the Table B.4

Table B.4 – Bit assignment of APS trigger bits

Bit number 9, 10 of WORD 2	Applications
0, 0	PSP off
0, 1	PSP on, split burst off
1, 0	PSP on, 2-line split burst on
1, 1	PSP on, 4-line split burst on

B.4 Analogue source bit

The analogue source bit consists of bit number 11 of WORD-2 in the 20-bit identification data format.

The purpose of the analogue source bit is to indicate whether the source of the incoming video signal originated from an analogue pre-recorded medium. The bit assignment of the analogue source bit is specified in Table B.5.

Table B.5 – Bit assignment of analogue source bit

Bit number 11 of WORD-2	Source material
1	Analogue pre-recorded package medium
0	Non-analogue pre-recorded package medium

Standards Survey

The IEC would like to offer you the best quality standards possible. To make sure that we continue to meet your needs, your feedback is essential. Would you please take a minute to answer the questions overleaf and fax them to us at +41 22 919 03 00 or mail them to the address below. Thank you!

Customer Service Centre (CSC)

International Electrotechnical Commission
3, rue de Varembé
1211 Genève 20
Switzerland

or

Fax to: **IEC**/CSC at +41 22 919 03 00

Thank you for your contribution to the standards-making process.

Nicht frankieren
Ne pas affranchir

Non affrancare
No stamp required

A Prioritaire

RÉPONSE PAYÉE

SUISSE

Customer Service Centre (CSC)
International Electrotechnical Commission
3, rue de Varembé
1211 GENEVA 20
Switzerland

Q1 Please report on **ONE STANDARD** and **ONE STANDARD ONLY**. Enter the exact number of the standard: *(e.g. 60601-1-1)*

.....

Q2 Please tell us in what capacity(ies) you bought the standard *(tick all that apply).* I am the/a:

purchasing agent ❑
librarian ❑
researcher ❑
design engineer ❑
safety engineer ❑
testing engineer ❑
marketing specialist ❑
other.....

Q3 I work for/in/as a: *(tick all that apply)*

manufacturing ❑
consultant ❑
government ❑
test/certification facility ❑
public utility ❑
education ❑
military ❑
other.....

Q4 This standard will be used for: *(tick all that apply)*

general reference ❑
product research ❑
product design/development ❑
specifications ❑
tenders ❑
quality assessment ❑
certification ❑
technical documentation ❑
thesis ❑
manufacturing ❑
other.....

Q5 This standard meets my needs: *(tick one)*

not at all ❑
nearly ❑
fairly well ❑
exactly ❑

Q6 If you ticked NOT AT ALL in Question 5 the reason is: *(tick all that apply)*

standard is out of date ❑
standard is incomplete ❑
standard is too academic ❑
standard is too superficial ❑
title is misleading ❑
I made the wrong choice ❑
other .....

Q7 Please assess the standard in the following categories, using the numbers:
(1) unacceptable,
(2) below average,
(3) average,
(4) above average,
(5) exceptional,
(6) not applicable

timeliness.....
quality of writing.....
technical contents.....
logic of arrangement of contents .....
tables, charts, graphs, figures.....
other .....

Q8 I read/use the: *(tick one)*

French text only ❑
English text only ❑
both English and French texts ❑

Q9 Please share any comment on any aspect of the IEC that you would like us to know:

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

ISBN 2-8318-6583-2

ICS 33.160.40

Typeset and printed by the IEC Central Office
GENEVA, SWITZERLAND