

CEA Standard

Standard Definition TV Analog Component Video Interface

CEA-770.2-D R-2012

April 2007



CEA[®]
Consumer Electronics Association

www.CE.org

NOTICE

Consumer Electronics Association (CEA[®]) Standards, Bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Bulletins and other technical publications shall not in any respect preclude any member or nonmember of CEA from manufacturing or selling products not conforming to such Standards, Bulletins or other technical publications, nor shall the existence of such Standards, Bulletins and other technical publications preclude their voluntary use by those other than CEA members, whether the standard is to be used either domestically or internationally.

Standards, Bulletins and other technical publications are adopted by CEA in accordance with the American National Standards Institute (ANSI) patent policy. By such action, CEA does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard, Bulletin or other technical publication.

This document does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

This document is copyrighted by the Consumer Electronics Association (CEA[®]) and may not be reproduced, in whole or part, without written permission. Federal copyright law prohibits unauthorized reproduction of this document by any means. Organizations may obtain permission to reproduce a limited number of copies by entering into a license agreement. Requests to reproduce text, data, charts, figures or other material should be made to CEA.

(Formulated under the cognizance of the CEA **R4.8 DTV Interface Subcommittee**.)

Published by
©CONSUMER ELECTRONICS ASSOCIATION 2012
Technology & Standards Department
www.CE.org

All rights reserved

CONTENTS

| | |
|--|----------|
| 1 Scope..... | 1 |
| 2 References..... | 1 |
| 2.1 Normative References..... | 1 |
| 2.1.1 Normative Reference List | 1 |
| 2.1.2 Normative Reference Acquisition | 2 |
| 2.2 Informative References..... | 2 |
| 2.2.1 Informative Reference Acquisition | 2 |
| 3 Video Components | 2 |
| 3.1 Black Level and Blanking Level | 2 |
| 3.2 Signals | 2 |
| 3.3 Y, P_B, P_R Component Set | 3 |
| 3.3.1 Luminance Y..... | 3 |
| 3.3.2 Color Difference Signal P_B..... | 3 |
| 3.3.3 Color Difference Signal P_R..... | 3 |
| 4 Impedance | 3 |
| 5 Clamping and Signal DC Content..... | 3 |
| 6 Component Timing | 4 |
| 7 Horizontal Blanking and Synchronization..... | 4 |
| 8 Vertical Blanking and Synchronization | 4 |
| 8.1 480i Video Format..... | 4 |
| 8.2 480p Video Format..... | 5 |
| 9 Interface Characteristics | 6 |
| 9.1 Cable Impedance and Channel Numbering | 6 |
| 9.2 Signal Source and Termination Impedance..... | 6 |
| 9.3 Signal Amplitude | 6 |
| 9.4 Time Coincidence | 6 |
| 10 Connector and Cable..... | 6 |
| 10.1 Connector | 6 |
| 10.2 Cables | 7 |

TABLES

| | |
|---|----------|
| Table 1 Scanning Systems..... | 1 |
| Table 2 Channel Specification | 3 |
| Table 3 480i Video Signal Horizontal Timing..... | 4 |
| Table 4 480p Video Signal Horizontal Timing | 4 |
| Table 5 480i Video Signal Vertical Timing | 5 |
| Table 6 480p Video Signal Vertical Timing | 6 |
| Table 7 Other 480p Vertical Timing Parameters (See Figure 3) | 6 |
| Table 8 Connector Color Code | 7 |

CEA-770.2-D R-2012

FIGURES

Figure 1 Y, P_B, P_R Component Set (100/0/100/0 Color Bar Example) 7

Figure 2 480i Vertical Blanking Interval 8

Figure 3 480p Vertical Blanking Interval 9

Figure 4 Horizontal Blanking Interval, Y Luminance Signal 10

FOREWORD

This standard was developed under the auspices of the Consumer Electronics Association (CEA) Technology & Standards R4.8 DTV Interface Subcommittee.

Other scanning structures for analog component interfaces are set forth in separate standards, identified by CEA-770.X notation.

Users of this standard should note that, at some future time, copy protection parameters, methods and/or standards are expected to be established with which copy-protected content traversing the component video interface will be required to comply.

For consumer video products, an optional multi-pin connector may be specified at a later date for inclusion of audio and control signals. At that time, this standard may be revised and given a new revision number and issue date.

CEA-770.2-D R-2012

(This page intentionally left blank.)

STANDARD DEFINITION TV ANALOG COMPONENT VIDEO INTERFACE

1 Scope

CEA-770.2-D defines the physical characteristics of an interface and the parameters of the signals carried across that interface, using three parallel channels for the interconnection of equipment operating with analog component video signals. CEA-770.2-D includes specifications for: (1) 480i video format defined by 480 active lines, 525 total lines, 2:1 interlaced at 59.94 or 60 fields/second; and, (2) 480p video format defined by 480 active lines, 525 total lines, progressively scanned at 59.94 or 60 frames/second. Both video formats shall be capable of either 4:3 or 16:9 aspect ratios.

Table 1 presents all the permissible scanning systems of CEA-770.2-D. A compliant interface shall implement one or more of these permissible scanning systems. Other scanning structures such as HDTV video formats are outside the scope of CEA-770.2-D (see CEA-770.3-C for HDTV scanning formats).

The signal characteristics are defined by a gamma-corrected component set: a luminance video and two accompanying color-difference signals, see SMPTE Standard 170M Section 5.

The intended uses of this interface should be:

- a) For interconnection between Digital Television (DTV) Set top boxes and compatible television receivers or monitors; or
- b) For interconnection between DTV compatible Cable TV Set top boxes or Satellite DBS Receiver Decoders, and television receivers or monitors; or
- c) To interconnect equipment into complete, self-contained analog component systems of relatively small size.

CEA-770.2-D applies to signals carried on the connectors described in Section 10 and may or may not apply to component signals carried on other types of connectors.

Table 1 Scanning Systems

| | Pixels per active line | Active lines per frame | Frame Rate (Hz) | Scanning Format | Total samples per line | Total lines per frame |
|---|------------------------|------------------------|-----------------|-----------------|------------------------|-----------------------|
| 1 | 704 | 480 | 30 | Interlaced | 858 | 525 |
| 2 | 704 | 480 | 30/1.001 | Interlaced | 858 | 525 |
| 3 | 720 | 480 | 30 | Interlaced | 858 | 525 |
| 4 | 720 | 480 | 30/1.001 | Interlaced | 858 | 525 |
| 5 | 704 | 480 | 60 | Progressive | 858 | 525 |
| 6 | 704 | 480 | 60/1.001 | Progressive | 858 | 525 |
| 7 | 720 | 480 | 60 | Progressive | 858 | 525 |
| 8 | 720 | 480 | 60/1.001 | Progressive | 858 | 525 |

2 References

2.1 Normative References

The following references contain provisions, which, through reference in this text, constitute normative provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated in Section 2.1.1.

2.1.1 Normative Reference List

ANSI/SMPTE Standard 170M (2004), Standard for Television – Composite Analog Video Signal – NTSC for Studio Applications