

CEA Standard

DTV Remodulator Specification with
Enhanced OSD Capability

CEA-761-B



CEA[®]
Consumer Electronics Association

www.CE.org

May 2007

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.

Note: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. The patent holder has, however, filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. Details may be obtained from the publisher.

This CEA Standard is considered to have International Standardization implication, but the International Electrotechnical Commission activity has not progressed to the point where a valid comparison between the CEA Standard and the IEC document can be made.

This Standard 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 Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

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

Published by
©CONSUMER ELECTRONICS ASSOCIATION 2007
Technology & Standards Department
1919 S. Eads Street
Arlington, Virginia 22202

**PRICE: Please call Information Handling Services, USA and Canada (1-800-854-7179)
International (303-397-7956), or**

<http://global.ihs.com>

All rights reserved

Printed in U.S.A.

PLEASE!

DON'T VIOLATE
THE
LAW!

This document is copyrighted by the Consumer Electronics Association (CEA[®])
and may not be reproduced without permission.

Organizations may obtain permission to reproduce a limited number of copies by
entering into a license agreement. For information contact:

Information Handling Services
15 Inverness Way East
Englewood, Colorado 80112-5704
or call U.S.A. and Canada 1-800-854-7179, International (303) 397-7956
See <http://global.ihs.com> or email global@ihs.com

FOREWORD

Users of CEA-761-B should note that, at some future point, it is expected that copy protection parameters, methods and/or standards with which copy-protected content traversing the DTV RF interface will be required to comply will be established.

Control of OSD applications may require a return path from the receiving device.

This standard was developed under the auspices of the CEA Technology & Standards R4.8 DTV Interface Subcommittee.

(This page intentionally left blank.)

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	1
2.2 Informative References	2
2.2.1 Informative References List.....	2
2.2.2 Informative References Acquisition	2
3 DTV Remodulator RF Output Specifications	2
3.1 Selectable Output Channel Frequency	2
3.2 Nominal RMS Output Level.....	3
3.3 Pilot Phase Noise	3
3.3.1 Pilot Phase Noise--8 VSB Trellis	3
3.3.2 Pilot Phase Noise--16 VSB	3
3.4 Error Vector Magnitude (EVM).....	3
3.4.1 EVM--8 VSB Trellis	3
3.4.2 EVM--16 VSB	3
3.5 Connector	4
3.6 Side-band Output.....	4
3.6.1 Double Sideband Specification	4
3.6.2 Vestigial Sideband Specification.....	4
3.7 Data and Clock Rates	5
4 On-Screen Display (OSD) Support.....	5
4.1 OSD Encapsulation.....	6
4.1.1 PES Encapsulation	6
4.1.2 Syntax and Semantics for PES Packets carrying OSD Information.....	6
4.1.3 Maximum Transmission Rate for OSD Data.....	8
4.1.4 Retransmission Recommendation.....	8
5 OSD Data.....	8
5.1 Alignment of OSD with Video	9
5.2 OSD Capability Profiles	9
6 DTV RF Remodulator Recommended Input Specifications	10
6.1 Input Overview	10
6.2 Input Recommendations from Remodulator to Source.....	11
6.3 Input Recommendations from Source to Remodulator	11
7 Measurement	12

TABLES

Table 1 Data and Clock Rates.....	5
Table 2 PES Packet Definition for Carrying OSD Information.....	7
Table 3 Capability Profiles	9
Table 4 OSD Capability Profiles	10

FIGURES

Figure 1 Double Sideband Transmission	4
Figure 2 VSB Channel Occupancy	5
Figure 3 Typical OSD System Illustration.....	6
Figure 4 OSD Data Packet Illustration	6

Figure 5 Remodulator System 11
Figure 6 Data_Valid Timing 12

DTV Remodulator Specification with Enhanced OSD Capability

1 Scope

CEA-761-B defines minimum specifications for a one-way data path utilizing an 8 VSB trellis or a 16 VSB remodulator in compliance with ATSC A/53E Annex D. CEA-761-B references CEA-799-A for on-screen display (OSD) capabilities.

The 8 VSB portion of CEA-761-B applies to devices capable of receiving 8 VSB signals and supporting "monitor mode." The 16 VSB portion of CEA-761-B applies to devices capable of receiving 16 VSB signals and supporting "monitor mode." For information concerning monitor mode recommendations, refer to CEA-CEB5-B.

CEA-761-B addresses required RF output specifications, on-screen display (OSD) capabilities, and capability profiles for a DTV remodulator and recommendations concerning input to the remodulator. This standard does not address 8 VSB without OSD. For information concerning 8 VSB without OSD, see CEA-762.

2 References

2.1 Normative References

The following standards contain provisions that, through reference in this text, constitute normative provisions of this standard. At the time of publication, the editions indicated were 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 editions of the standards listed in 2.1.

2.1.1 Normative Reference List

ANSI/SCTE 02 2006, *Specification for "F" Port, Female, Indoor*

ATSC A/53E, *ATSC Digital Television Standard*, with Amendment 1, April 18, 2006

ATSC A/64A, *Transmission Measurement and Compliance for Digital Television*, May 30, 2000

CEA-542-B, *Cable Television Channel Identification Plan*, July 2003

CEA-762, *DTV Remodulator Specification*, October, 2002

CEA-799-A, *On-Screen Display (OSD) Specification*, July, 2006

IEC 60169-24, *Radio-frequency connectors - Part 24: Radio-frequency coaxial connectors with screw coupling, typically for use in 75 ohm cable distribution systems (Type F)*, (1991-11)

2.1.2 Normative Reference Acquisition

ANSI/SCTE Standards:

- Society of Cable Telecommunications Engineers Inc. (SCTE), 140 Philips Road, Exton, PA 19341-1318; Phone 800-542-5040; Fax 610-363-5898; Internet <http://www.scte.org>; Email info@scte.org ; OR
- Global Engineering Documents, World Headquarters, 15 Inverness Way East, Englewood, CO USA 80112-5776; Phone 800-854-7179; Fax 303-397-2740; Internet <http://global.ihs.com>; Email global@ihs.com