

# ANSI/CEA Standard

Intermediate Frequencies for  
Entertainment Receivers

ANSI/CEA-109-D R-2015

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**CEA**  
Consumer Electronics Association®  
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(Formulated under the cognizance of the CEA **R4 Video Systems Committee.**)

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## FOREWORD

This standard was developed under the auspices of the Consumer Electronics Association (CEA) R4 Video Systems Committee.

CEA-109-D supersedes EIA-REC109-C and CEA-REC109-C.

NOTE—In 2003, CEA redesignated EIA/CEA standards and bulletins, and those EIA standards under CEA auspices, as CEA standards or bulletins, respectively. Please see <http://global.ihs.com> for the most recent designation.

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## Intermediate Frequencies for Entertainment Receivers

### 1 Scope

CEA-109-D specifies Intermediate Frequencies (IFs) to be used in Standard Broadcast (AM), FM, and TV broadcast receivers.

In CEA-109-D, the term Intermediate Frequency (IF) refers to the dominant interference-rejecting and passband-shaping circuits in receiver front-ends.

### 2 References

#### 2.1 Informative References

##### 2.1.1 Informative Reference List

47 C.F.R. §73.207(b), Minimum Distance Separation Between Stations

47 C.F.R. §73.682(a)(3), TV Transmission Standards

47 C.F.R. §73.698, Tables

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

##### 2.1.2 Informative Reference Acquisition

CEA Standards and Bulletins:

- 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](mailto:global@ihs.com)

Federal Communications Commission (FCC) Regulations:

- U.S. Code of Federal Regulations (C.F.R.), U.S. Government Printing Office, Washington, D.C. 20401; <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

### 3 IFs for Analog FM Broadcast Receivers

FM broadcast receivers typically use 10.7 MHz as the IF.

NOTE—This is consistent with the FCC channel spacing requirements in 47 C.F.R. §73.207(b).

### 4 IFs for Analog AM Broadcast Receivers

AM broadcast receivers typically use 455 kHz or 450 kHz as the IF.

### 5 Television Receivers

For single-conversion analog or digital television receivers, the (one) filter performing the IF function is typically centered on 44 MHz.

In the case of double-conversion analog or digital television receivers, a translation of the input signal to a higher first IF may occur, and this may be associated with some rejection of interference (e.g., image frequencies). Such double-conversion receivers typically have a second IF, typically with much narrower bandwidth, and typically centered on 44 MHz. Further translation of the 44 MHz IF output to lower frequencies may occur at the discretion of the receiver designer (e.g., to facilitate analog-to-digital conversion), but such lower frequencies are not considered IFs as CEA-109-D defines IF.

By using 44 MHz as the first IF, analog television receiver designs benefit from associated protections built into the FCC channel assignments. In addition, both analog and digital television receiver designs benefit from the identification of TV-IF spectrum that could be vulnerable to interference from any new services that might seek to use this band.