CGMS-A Plus RC

Response to CPTWG-ARDG CFI
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Multicompany Submission
(Matsushita, Mitsubishi, Hitachi, Intel, JVC,
Samsung, Thomson, Toshiba)

CGMS-A Plus RC History

- **CGMS-A Plus RC**
  - CGMS-A = Copy Generation Management System Analog
  - RC = Redistribution Control

- **CGMS-A conveys basic copy protection information over an analog video interface through vertical blanking interval data**
  - CGMS-A has been in existence for a long time (circa 1995)
  - Standardized by various organizations including IEC and EIA/CEA

- **RC conveys information relating to control over unauthorized consumer redistribution**
  - Standardized by CEA as Redistribution Control Information, RCI, using the same analog video interface through VBI data as CGMS-A (Aug. 2003)
  - Allows translation of different forms of RC such as RCI and ATSC Redistribution Control Descriptor, "Broadcast Flag" (Oct. 2001)
Where CGMS-A Is Used

- **DVD-Video**
  - CSS licensed CE players
- **D-VHS**
- **DVD Recorders**
  - CPRM CE licensed recorders
  - +R/+RW
- **Blu-ray Recorders**
- **Japan Digital Broadcast**
  - Receivers STB, TV, Tuner integrated recorders for Satellite and in near future Terrestrial broadcasting (mandated by conditional access system adopter agreement)

Primary Standards

- **CGMS-A and RC**
  - CEA-805A for analog component video interfaces
    - 480p on line 41; 720p on line 24; 1080i on line 19
- **CGMS-A only**
  - IEC 61880 for 525i (480i) on line 20
  - IEC 61880-2 for 525p (480p) on line 41
  - EIA/CEA-608-B for 525i (480i) on line 21
  - Japan
    - Technical Reference C 0011 used for D-VHS and DV formats
    - ARIB Standards TR-B14 and -B15 used for Digital Broadcasting both Terrestrial (B14) and Satellite (B15)
  - Just like CEA-805 was recently amended, it might be possible to update the above standards to include RC
    - CEA has already started such process for CEA-608B
Payload Data Packet CEA-805A

<table>
<thead>
<tr>
<th>Payload Bit, RCI</th>
<th>CGMS-A and RC Bit Definitions in CEA-805A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Payload Bits</strong></td>
<td><strong>CGMS-A Definition</strong></td>
</tr>
<tr>
<td>G0, G1</td>
<td>Copying is permitted without restriction</td>
</tr>
<tr>
<td>0, 0</td>
<td>No more copies (one generation copy has been made)*</td>
</tr>
<tr>
<td>0, 1</td>
<td>One generation of copies may be made</td>
</tr>
<tr>
<td>1, 0</td>
<td>No copying is permitted</td>
</tr>
<tr>
<td>1, 1</td>
<td>* This definition differs from CEA-608-B, IEC61880, and IEC 61880-2 where it is presently a Reserved state</td>
</tr>
</tbody>
</table>

**MSB**

<table>
<thead>
<tr>
<th>Version Number Byte</th>
<th>0x01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Packet Payload in Bytes</td>
<td>Length of Packet Payload = 0x10</td>
</tr>
<tr>
<td>Data Byte 1</td>
<td>AR1</td>
</tr>
<tr>
<td>Data Byte 2</td>
<td>C3</td>
</tr>
<tr>
<td>Data Byte 3</td>
<td>RCI</td>
</tr>
<tr>
<td>Data Byte 4</td>
<td>Reserved for Future Use (shall be 0)</td>
</tr>
<tr>
<td>Data Byte 5</td>
<td>Reserved for Future Use (shall be 0)</td>
</tr>
<tr>
<td>Data Bytes 6-13</td>
<td>Other Data</td>
</tr>
<tr>
<td>Data Byte 14</td>
<td>CRC</td>
</tr>
</tbody>
</table>

**Byte-3: CGMS-A bits are G0 and G1; RC bit is RCI**
CGMS-A Plus RC Attributes

- **CGMS-A is a simple and mature technology already implemented on a voluntary basis in many CE devices**
  - 2-bits for CGMS-A and 1-bit for RC
  - Although RC has been only recently standardized (CEA 805A), it is conveyed in the same data packet as CGMS-A
- **CGMS-A Plus RC leverages VBI capability and protection**
  - Requires minimal additional resources for devices that already process the packet structure of the VBI
    - Redesign of components that already support CGMS-A will be needed to also include support for RC
  - Although CGMS-A and RCI as specified in CEA-805A can be removed relatively easily by analog filtering or stripping of the VBI, changing the individual bit states is much more difficult