



**ATSC**

ADVANCED TELEVISION  
SYSTEMS COMMITTEE

# **ATSC Standard: A/331:2023-10 Amendment No. 1, “MMT Signing”**

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13 December 2023

**Advanced Television Systems Committee**  
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### Revision History

Version	Date
Amendment approved	13 December 2023

## **ATSC Standard: A/331:2023-10 Amendment No. 1, “MMT Signing”**

### **1. OVERVIEW**

#### 1.1 Definition

An Amendment is generated to document an enhancement, an addition or a deletion of functionality to previously agreed technical provisions in an existing ATSC document. Amendments shall be published as attachments to the original ATSC document. Distribution by ATSC of existing documents shall include any approved Amendments.

#### 1.2 Scope

This document describes improvements related to signal signing for emissions using the MMT protocol. This amendment is in response to New Project Proposal N-065r0, “MMT Signing Improvements.”

#### 1.3 Rationale for Changes

The changes described in this document are being proposed in order to fix an error in an informative example and to add a constraint that significantly improves efficiency.

#### 1.4 Compatibility Considerations

The changes described in this document are backward-compatible relative to ATSC A/331:2023-08, which is the currently published version of the standard at the time that this amendment was drafted.

### **2. LIST OF CHANGES**

Change instructions are given below in *italics*. Unless otherwise noted, inserted text, tables, and drawings are shown in **blue**; deletions of existing text are shown in **red-strikeout**. The text “[ref]” indicates that a cross reference to a cited referenced document should be inserted.

#### 2.1 Normative References

*No changes proposed.*

#### 2.2 Informative References

*No changes proposed.*

#### 2.3 Acronyms and Abbreviations

*No changes proposed.*

#### 2.4 Terms

*No changes proposed.*

## 2.5 Change Instructions

Update Section 7.2.5 as follows:

### 7. [PLACEHOLDER]

#### 7.2 [Placeholder]

##### 7.2.5 SIGNED\_MMT\_MESSAGE

~~The broadcaster signature for any MMTP-specific message, including `mmt_atsc3_message()`, is carried in the `signed_mmt_message()` structure defined as follows.~~

All MMTP messages with MMTP packet type == 0x2, except those with a `message_id` of 0x8101 (`signed_mmt_message()`), shall be carried as a `message_instance()` within the `signed_mmt_message()` structure as specified in this section. When any MMTP-specific signaling message as specified in Clause 10 of 23008-1 [38] and when any MMT ATSC3 (MA3) messages as specified in Section 7.2.3.1 are transmitted, such messages shall be transmitted as a `message_instance()` in a `signed_mmt_message()`.

**Table 7.1** Bitstream Syntax for `signed_mmt_message()`

Syntax	No. of Bits	Format
<code>signed_mmt_message() {</code>		
<code>message_id</code>	16	uimbsf
<code>version</code>	8	uimbsf
<code>length</code>	32	uimbsf
<code>message_payload {</code>		
<code>message_instance()</code>		
<code>atsc3_signature_length</code>	16	uimbsf
for ( <code>i=0;i&lt;atsc3_signature_length;i++</code> ) {		
<code>atsc3_signature_byte</code>	8	uimbsf
}		
}		
}		

Signing only MMTP packets with a type field equal to 0x2 limits signing to MMTP packets carrying signaling messages and MA3 messages and excludes signing from MMTP packets carrying Assets.

**message\_id** – A 16-bit unsigned integer field that shall uniquely identify the `signed_mmt_message()`. The value of this field shall be 0x8101.

**version** – An 8-bit unsigned integer field that shall indicate the version of the `signed_mmt_message()`. When the `message_instance()` with a particular `message_id` attribute changes, the version of the `signed_mmt_message()` shall change. When there are two or more `message_instance()`s with different `message_id` attributes, the version of the `signed_mmt_message()` associated with those `message_id` attributes shall differ. The version attribute value shall not be reused until after a `signed_mmt_message()` with the associated `message_id` and an updated version attribute has been emitted.

**length** – A 32-bit unsigned integer field that shall provide the length of `signed_mmt_message()` in bytes, counting from the beginning of the next field to the last byte of the `signed_mmt_message()`.

**message\_payload** – The message payload includes the message\_instance() that is signed along with its signature.

**message\_instance()** – The signed MMT signaling message instance which shall be the mmt\_atsc3\_message() or a message specified in ISO/IEC 23008-1 [38] Clause 10.

**atsc3\_signature\_length** – A 16-bit unsigned integer field that shall provide the length of the signature data contained in this message.

**atsc3\_signature\_byte** – An 8-bit unsigned integer field that shall contain a byte of the signature of this message. ~~The atsc3\_signature\_compression shall be applied to the signature content. The signature content shall be based on the message\_instance() data only. the signature across the sequence of bytes contained in the signed\_mmt\_message up to but not including the first atsc3\_signature\_byte.~~ The signature shall be as described in A/360 [10] Section 5.2.2.5, “Signatures for MMT Messages”.

The following sequence is an example of the usage of the **version** attribute:

- 1) message\_id attribute of the message\_instance() = A; version attribute of the message\_instance() = 1; version attribute of the signed\_mmt\_message() = 1;
- 2) message\_id attribute of the message\_instance() = B; version attribute of the message\_instance() = 1; version attribute of the signed\_mmt\_message() = 2;
- 3) message\_id attribute of the message\_instance() = A; version attribute of the message\_instance() = 1; version attribute of the signed\_mmt\_message() = 1;
- ~~4) message\_id attribute of the message\_instance() = B; version attribute of the message\_instance() = 1; version attribute of the signed\_mmt\_message() = 3;~~
- 4) message\_id attribute of the message\_instance() = B; version attribute of the message\_instance() = 1; version attribute of the signed\_mmt\_message() = 2;
- 5) message\_id attribute of the message\_instance() = A; version attribute of the message\_instance() = 2; version attribute of the signed\_mmt\_message() = 3;
- 6) message\_id attribute of the message\_instance() = B; version attribute of the message\_instance() = 2; version attribute of the signed\_mmt\_message() = 4;

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