

ATSC Standard: A/344:2023-03 Amendment No. 1, “RF Signal Change API”

Doc. A/344:2023-03 Amend. No. 1
19 May-2023

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Revision History

Version	Date
Amendment approved	19 May 2023

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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 amendment is in response to [New Project Proposal N-046](#). This is an addition of an API to return RF signal strength.

1.3 Rationale for Changes

This would allow a Broadcaster Application to collect RF reception data in order to compare with RF propagation maps to display as 'heat map' for comparative analysis. Data collected by the broadcaster could be used to optimize broadcast emission. There is no such API today.

1.4 Compatibility Considerations

Since this is an additional API and no changes to existing APIs, this is backwards compatible.

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. **Yellow highlighted references** indicate the document editor should insert the appropriate internal document references.

2.1 Change Instructions

Add the following normative references:

- [a]** ATSC: “ATSC Standard: System Discovery and Signaling,” Doc. A/321:2023-03, Advanced Television Systems Committee, Washington, DC, 28 March 2023.
- [b]** ATSC: “ATSC Standard: Link Layer Protocol,” Doc. A/330:2023-03, Advanced Television Systems Committee, Washington, DC, 28 March 2023.

Add an informative reference:

- [c]** Android Media TV onSignalStrengthUpdated
[https://developer.android.com/reference/android/media/tv/TvView.TvInputCallback#onSignalStrengthUpdated\(java.lang.String,%20int\)](https://developer.android.com/reference/android/media/tv/TvView.TvInputCallback#onSignalStrengthUpdated(java.lang.String,%20int))

Extend Table 9.25 as follows:

Table 9.1 Asynchronous Notifications

msgType	Event Description	Reference
ratingBlock	Content Advisory Rating Block Change – a notification that is provided whenever the user changes the content advisory rating settings in the Receiver such that the current content being decoded goes from blocked to unblocked or unblocked to blocked.	Sec. 9.3.2
serviceChange	Service Change – a notification that is provided if a different service is acquired due to user action, and the new service signals the URL of the same application.	Sec. 9.3.3
captionState	Caption State – a notification that is provided whenever the user changes the state of closed caption display (either off to on, or on to off).	Sec. 9.3.4
langPref	Language Preference – a notification that is provided whenever the user changes the preferred language.	Sec. 9.3.5
captionDisplayPrefs	Closed Caption display properties preferences.	Sec. 9.3.6
audioAccessibilityPref	Audio Accessibilities preferences.	Sec. 9.3.7
alertingChange	Alerting Change – a notification that a new version of either the AEAT or OSN messages has been received or if alert filtering preferences have been changed resulting in events becoming unfiltered.	Sec. 9.3.8
contentChange	Content Change – a notification that new content has been placed in the Application Context Cache and may be accessed by the Broadcaster Application.	Sec. 9.3.9
serviceGuideChange	Service Guide Change – a notification that is provided when new ESG fragments have been received.	Sec. 9.3.10
signalingData	Signaling Data Change – a notification that some new signaling data has been received.	Sec. 9.3.11
dialogEnhancementPrefChange	Dialog Enhancement Preference Change – a notification that is provided whenever the user changes the state or amount of dialog enhancement processing in the user's preferences.	Sec. 9.3.12
dialogEnhancementLimitChange	Dialog Enhancement Limit Change – a notification that is provided whenever the incoming audio stream signals a changed limit for dialog enhancement processing.	Sec. 9.3.13
rfSignalChange	RF Signal Change – a notification that is provided whenever some aspect of the received RF signal changes.	Sec. 9.3.14
contentRecoveryStateChange	Content Recovery State Change – a notification that is provided whenever use of audio watermark, video watermark, audio fingerprint, and/or video fingerprint for content recovery changes.	Sec. 9.9.4
displayOverrideChange	Display Override Change – a notification that is provided if the display override state or the state of blocked application access to certain resources changes.	Sec. 9.9.5
recoveredComponentInfoChange	Recovered Component Info Change – a notification that is provided if a component of the service being received by the Receiver changes at the upstream.	Sec. 9.9.6
rmpMediaTimeChange	RMP Media Time Change – a notification that is provided periodically during playback.	Sec. 9.13.5
rmpPlaybackStateChange	RMP Playback State Change – a notification that is provided if the playback state changes.	Sec. 9.13.6
rmpPlaybackRateChange	RMP Playback Rate Change – a notification that is provided if playback speed changes.	Sec. 9.13.7

DRM	DRM Notification – a notification that provides messages from the content protection system to the Broadcaster Application.	Sec. 9.14.1
xlinkResolution	XLink Resolution – a notification that is provided when the RMP encounters a period with an XLink attribute.	Sec. 9.15.1

Extend Table 9.26 as follows:

Table 9.2 Subscription Parameter List

Notification APIs	Reference	msgType
All Notification APIs	-	All
Rating Block Change Notification API	9.3.2	ratingBlock
Service Change Notification API	9.3.3	serviceChange
Caption State Change Notification API	9.3.4	captionState
Language Preference Change Notification API	9.3.5	languagePref
Caption Display Preferences Change Notification API	9.3.6	captionDisplayPrefs
Audio Accessibility Preference Change Notification API	9.3.7	audioAccessibilityPref
Alerting Change Notification API	9.3.8	alertingChange
Content Change Notification API	9.3.9	contentChange
Service Guide Change Notification API	9.3.10	serviceGuideChange
Signaling Data Change Notification API	9.3.11	signalingData
Dialog Enhancement Preference Change Notification API	9.3.12	dialogEnhancementPrefChange
Dialog Enhancement Limit Change Notification API	9.3.13	dialogEnhancementLimitChange
RF Signal Change Notification API	9.3.14	rfSignalChange
Content Recovery State Change Notification API	9.9.4	contentRecoveryStateChange
Display Override Change Notification API	9.9.5	displayOverrideChange
Recovered Component Info Change Notification API	9.9.6	recoveredComponentInfoChange
RMP Media Time Change Notification API	9.13.5	rmpMediaTimeChange
RMP Playback State Change Notification API	9.13.6	rmpPlaybackStateChange
RMP Playback Rate Change Notification API	9.13.7	rmpPlaybackRateChange
DRM Notification API	9.14.1	DRM
XLink Resolution Notification API	9.15.1	xlinkResolution

Add a new section 9.3.14:

9.3.14 RF Signal Change Notification API

The RF Signal Change Notification shall be issued by the Receiver to the currently executing Broadcaster Application if any of the properties listed in [Table 9.43](#) change in the currently tuned RF channel and the Broadcaster Application has subscribed to receive such notifications via the API specified in Section [9.3.1](#).

The RF Signal Change Notification semantics shall be as defined in [Table 9.43](#) and the syntax defined in the schema file `org.atsc.notify-rfSignalChange.json`. Additional semantic definitions of the parameters follow the table.

Upon subscription, the Receiver shall promptly issue an initial notification. There should not be notifications more than once per second. The calculation of the field values is Receiver dependent.

Table 9.43 RF Signal Change Notification Semantics

Property Name	Use	Data Type	Short Description
jsonrpc	1	string	"2.0"
method	1	string	"org.atsc.notify"
msgType	1	enum	"rfSignalChange"
rfChannel	1	integer	The RF channel number
frequency	1	integer	The frequency in Hertz
signalQuality	1	enum	"lost", "weak" or "strong"
signalStrength	0..1	integer (0 ... 100)	Signal strength represented as a percentage 0 to 100
gainLevel	0..1	integer (0 ... 100)	Gain level represented as a percentage 0 to 100
bootstrapLock	0..1	boolean	Indicates successful bootstrap symbol acquisition
alpLock	0..1	boolean	Indicates successful ALP data acquisition

`rfChannel` – This required property shall contain the RF channel number of the currently tuned RF channel.

`frequency` – This required property shall contain the center frequency in Hz of the currently tuned RF channel.

`signalQuality` – This required property shall provide a simplified overall RF quality aligned with the Android Media TV `onSignalStrengthUpdated` API [c]. The available values are "lost", "weak" or "strong".

`signalStrength` – This optional property shall provide the received signal strength reported as a percentage. The available values are in the range zero to 100, inclusive.

`gainLevel` – This optional property shall provide the average signal gain level of the tuner reported as a percentage. The available values are in the range zero to 100, inclusive.

`bootstrapLock` – This optional Boolean property shall confirm, if "true", the A/321 defined symbol acquisition [a]. A "false" value shall indicate that bootstrap symbol acquisition cannot be confirmed.

`alpLock` – This optional Boolean property shall confirm, if "true", the A/330 ATSC Link-Layer Protocol (ALP) data acquisition [b]. A "false" value shall indicate that ALP data acquisition cannot be confirmed.

For example, the Receiver might provide the following notification:

```
<-- {  
  "jsonrpc": "2.0",  
  "method": "org.atsc.notify",  
  "params": {  
    "msgType": "RFSignalChange",  
    "rfChannel": 15,  
    "frequency": 479000000,  
    "signalQuality": "strong",  
    "signalStrength": 75,  
    "gainLevel": 50,  
    "bootstrapLock": true,  
    "alpLock": true  
  }  
}
```

– End of Document –