



## **REPG01: Technical Specification**

v0.6.1 (2009-06-15)

All contributions and comments  
should be sent to [feedback@radiodns.org](mailto:feedback@radiodns.org)

**This document is still a work in progress and is regularly  
being updated. Please ensure you have the latest revision  
available from <http://radiodns.org/>**

## Table of Contents

Table of Contents.....	2
Introduction.....	3
Concept.....	4
Implementation.....	5
Request.....	6
VHF/FM.....	6
DAB Digital Radio.....	7
DRM (Digital Radio Mondiale) / AMSS (AM Signalling System).....	7
HD Radio (iBiquity Digital Corporation's HD Radio).....	8
IP-delivered Audio.....	8
Response.....	9
Considerations.....	10
Existing EPG delivery methodology.....	10
Contributors.....	11
Document Revisions.....	12

## **Introduction**

An Electronic Programme Guide can be utilised by a radio device to provide information on both current and future shows. This information includes timing, contact details, synopsis etc. and can provide a wealth of extra functionality to a radio device.

Whilst methods already exist for DAB Digital Radio (DAB) and Digital Radio Mondial (DRM) there is no common multi-protocol specification for the delivery of EPG data for audio protocols such as VHF/FM, IP-delivered audio, HD Radio etc.

## Concept

By making a specified request to the application, an XML EPG document is returned which the device can then process and provide a range of EPG-related functionality.

A successful transaction would involve the following stages:

1. **Service Selection**

The user selects a service on the device and begins listening.

2. **Application Lookup**

The process described in the previous RadioDNS document takes place and provides a location where the EPG application resides and can be queried. The SRV record for this application will be `_radioepg`.

3. **EPG Request**

A request is made to the location obtained in stage 2.

4. **EPG Response**

The response received will contain an XML EPG document.

# Implementation

This document specifies the implementation for EPG for the following audio delivery protocols:

- VHF/FM
- DAB Digital Radio
- DRM (Digital Radio Mondiale)
- HD Radio (iBiquity Digital Corporation's HD Radio)
- IP-delivered Audio
- Other bearers may be supported, and will require subsequent definition.

## Request

The document is requested through a standard HTTP request. The FQDN would be that obtained from the initial RadioDNS service resolution. The specific path includes a query string which identifies the specific service the EPG data is required for and the structure is dependent on bearer (as detailed below).

It is important to remember that all values should be URL-encoded to ensure compatibility with HTTP.

## VHF/FM

To request an EPG document for a VHF/FM service, the path to request would be:

**`/epg?b=vhf-fm&(ecc|country)=<ecc|country>&pi=<pi>&freq=<freq>`**

The parameters are populated as follows:

Parameters	Description	Value	Status
<b>ecc</b>	<b>Extended Country Code (ECC) and country code</b> The broadcast RDS ECC code concatenated with the first character of the broadcast RDS PI code (country code) must be supplied if available	<i>3-char hexadecimal</i>	<i>mutually exclusive</i>
<b>country</b>	<b>ISO 3166 two-letter country code</b> In the event that a broadcast ECC is unavailable, an ISO 2-letter country code must be provided	<i>2-char string</i>	
<b>pi</b>	<b>Programme Identification (PI)</b> The broadcast RDS PI code	<i>4-char hexadecimal</i>	<i>mandatory</i>
<b>freq</b>	<b>Frequency</b> The frequency on which the service is received in units of 10KHz	<i>float (5, 3)</i>	<i>mandatory</i>

For a detailed explanation on these parameters and their values, please refer to the VHF/FM section of the RadioDNS Specification ("*FQDN construction for Broadcast Protocols*", "*RDNS01: Technical Specification*" [RadioDNS.org](http://RadioDNS.org)).

## DAB Digital Radio

To request an EPG document for a DAB Digital Radio service, the path to request would be:

```
/epg?b=dab&ecc=<ecc>&eid=<eid>&sid=<sid>&scids=<scids>  
[&appty-ua type=<appty-ua type>]
```

The parameters are populated as follows:

Parameters	Description	Value	Status
<b>ecc</b>	<b>Extended Country Code (ECC)</b> The service's broadcast multiplex ECC code	<i>3-char hexadecimal</i>	<i>mandatory</i>
<b>eid</b>	<b>Ensemble Identifier (EId)</b> The service's broadcast multiplex ensemble ID	<i>4-char hexadecimal</i>	<i>mandatory</i>
<b>sid</b>	<b>Service Identifier (SIId)</b> The service's broadcast identifier	<i>4 or 8-char hexadecimal</i>	<i>mandatory</i>
<b>scids</b>	<b>Service Component Identifier within the Service (SCIdS)</b> The service's broadcast component identifier	<i>1 or 3-char hexadecimal</i>	<i>mandatory</i>

If the audio service is delivered as data via X-PAD, the following parameter is also mandatory:

<b>appty-ua type</b>	<b>X-PAD Application Type (AppTy) and User Application type (UAType)</b> The X-PAD Application Type number and User Application Type, concatenated with a hyphen (only for applications broadcast in X-PAD). Where Application Types are allocated in pairs, the lower value (indicating the start of the application data group) must be used.	<i>2-char hexadecimal, hyphen, 3- char hexadecimal</i>	<i>mandatory when referring to an X-PAD component, omitted otherwise</i>
----------------------	--	--	--

If the audio service is delivered as data in an independent Service Component, the following parameter is mandatory:

<b>pa</b>	<b>Packet Address</b> The packet address of the data service delivering the audio service	<i>integer between 0 and 1023</i>	<i>mandatory when referring to a data service component, omitted otherwise</i>
-----------	--	-----------------------------------	--

For a detailed explanation on these parameters and their values, please refer to the DAB Digital Radio section of the RadioDNS Specification ("*FQDN construction for Broadcast Protocols*", "*RDNS01: Technical Specification*" [RadioDNS.org](http://RadioDNS.org)).

## **DRM (Digital Radio Mondiale) / AMSS (AM Signalling System)**

To request an EPG document for a DRM / AMSS service, the path to request would be:

**`/epg?b=(drm|amss) &sid=<sid>`**

The parameters are populated as follows:

<b>Parameters</b>	<b>Description</b>	<b>Value</b>	<b>Status</b>
<b>sid</b>	<b>Service Identifier (Sid)</b> The service's broadcast identifier	<i>6-char hexadecimal</i>	<i>mandatory</i>

For a detailed explanation on these parameters and their values, please refer to the DRM / AMSS section of the RadioDNS Specification ("*FQDN construction for Broadcast Protocols*", "*RDNS01: Technical Specification*" [RadioDNS.org](http://RadioDNS.org)).



## HD Radio (iBiquity Digital Corporation's HD Radio)

To request an EPG document for a DRM / AMSS service, the path to request would be:

`/epg?b=hd&tx=<tx>&cc=<cc>`

The parameters are populated as follows:

Parameters	Description	Value	Status
<b>tx</b>	<b>Transmitter Identifier</b> The service's broadcast transmitter identifier	<i>5-char hexadecimal</i>	<i>mandatory</i>
<b>cc</b>	<b>Country Code</b> The service's broadcast country code	<i>3-char hexadecimal</i>	<i>mandatory</i>

For a detailed explanation on these parameters and their values, please refer to the HD Radio section of the RadioDNS Specification (*"FQDN construction for Broadcast Protocols", "RDNS01: Technical Specification" RadioDNS.org*).

## IP-delivered Audio

To request an EPG document for a DRM / AMSS service, the path to request would be:

`/epg?url=<url>`

The parameters are populated as follows:

Parameters	Description	Value	Status
<b>url</b>	<b>Uniform Resource Locator (URL)</b> The URL from which the audio is being served, including the path including additional parameters that must uniquely identify the audio	<i>string</i>	<i>mandatory</i>

## **Response**

When sending an EPG XML document request, the HTTP status code of the returned response indicates the success or failure of the request.

A status code 200 implies that the document was retrieved successfully, any other status implies some form of error. Please see the official HTTP status code definitions (*Section 10, "RFC2616: Hypertext Transfer Protocol – HTTP/1.1", Fielding et al.*) for detailed information.

The payload itself will be an XML document which adheres to the ETSI TS 102 818 XML Specification for DAB Electronic Programme Guide (EPG). Details on parsing this document fall outside this specification and you should consult the ETSI specification for detailed information.

## **Considerations**

### **Existing EPG delivery methodology**

It is acknowledged that DAB and DRM have existing methods in place for the delivery of EPG data over the broadcast platform. This specification is not designed to replace these. However, due to multiplex restrictions, for example, it may only be possible for a service provider to offer EPG data over IP through a system such as RadioEPG. The aim of this specification is to provide a common method for multiple audio delivery protocols for radio.

On certain radio services it is possible that EPG data may be available both “over-the-air” and also via RadioEPG over IP. In these situations it is at the devices discretion which data to use, but it is important to consider the absence of an IP connection on disconnected devices whereby DAB reception would always be preferential. It is also an important consideration for audio service providers to ensure the EPG data transmitted over the air on platforms such as DAB and DRM is the data offered via their IP-based RadioEPG system.

### **Updating the DAB EPG specification**

It may be that the additional platforms capable of surfacing DAB EPG XML content through RadioEPG creates opportunities to extend and enrich the DAB EPG specification. Any changes made should be fed back through the correct channels back to the DAB EPG XML working group of ETSI.