

RadioText Plus

— a new enhancement to the RDS RadioText service

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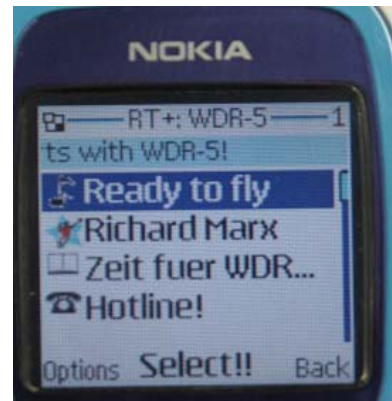
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This article is an excerpt from the RadioText Plus (RT+) Specification. It sets out to explain in brief the basic principles of RT+, which has been developed jointly by Westdeutscher Rundfunk (WDR), Nokia and the Institut für Rundfunktechnik (IRT). The purpose of RT+ is to enable analogue FM RDS radios to display information such as Artist and Track details for songs, scrolling news headlines, information about the radio station, etc.

RadioText Plus or RT+ is “semantic analogue radio”. It allows the RDS feature *RadioText* (RT) to be understood by FM RDS receiving terminals. RT+ is based on RDS RT messages and is completely backwards compatible with RT.

RT+ has been designed to let the listener (or user) derive additional benefits from the RDS RadioText service. It enables FM RDS receivers to “understand” the RadioText – to recognize designated objects, to make those objects manageable by the user and thus offer the user direct access to specific elements of RadioText messages. Such an element can, for example, be programme-associated metadata such as the *Title* and the *Artist* of the currently playing song, or it can be news headlines. This provides the listener with an “mp3-player feeling” while listening to analogue FM radio. The elements can also carry additional service messages or information about the Radio Station such as the telephone number or the web address of the Radio Station’s hotline. A full list of the RT Content types can be found at [1].



These objects, or more accurately *RT+ information elements* carried in the RDS RadioText (RT) messages, are identified by their location within the RT messages and by the class code of their content type.

Once an information element is received and understood, a receiver is able to, for example, store the different RT+ information elements and the listener may then select and request a specific content type from the radio’s memory at an instant in time that suits the listener’s needs. Thus the listener is no longer forced to watch the RT information passing (scrolling) by. Moreover, RT+ offers selected RT message elements to car drivers on a static display, without risk of distracting the attention of the driver. Furthermore, RT+ is well suited for mobile phones with built-in FM receivers: telephone numbers can be directly used to initiate calls, and web addresses can be used to start browsing the web content offered by the radio programme provider. Last but not least, RT+ is also used for satellite radio broadcasting via DVB-S. It may be adopted by DRM and DAB in the future, too.

All additional information necessary for implementing the RT+ service is carried in the RDS group 3A and in an appropriate RDS ODA group, as shown in the table below.

RT+ information elements		
RT Message	RT+ identification	RT+ Tag
RDS group 2A/B	RDS group 3A	RDS ODA group xA

RT+ Tags

When an RT message such as “You are listening to ‘House of the Rising Sun’ by Eric Burdon” is sent out, the RT+ information elements **title** and **artist** are marked by two RT+ Tags.

An RT+ Tag consists of three elements:

- RT Content Type;
- Start Marker, pointing to the position (inside the RT message) of the first character of that RT+ information element;
- Length Marker, indicating the additional length (in addition to the character at the start position) of that RT+ information element.

For the example given above the two tags are as follows:

RT Content Type	ITEM. TITLE	ITEM. ARTIST
Start Marker	22	50
Length Marker	22	10

Start Marker and Length Marker can be derived from the scheme shown below.

```

You are listening to „House of the rising sun“ by Eric Burdon
0----0----1----1----2----2----3----3----4----4----5----5----6---
0----5----0----5----0----5----0----5----0----5----0----5----0---
```

List of RT content types

The full list of defined content types is given in [1]. There are 64 classes of content types available. The classes are grouped in the following categories:

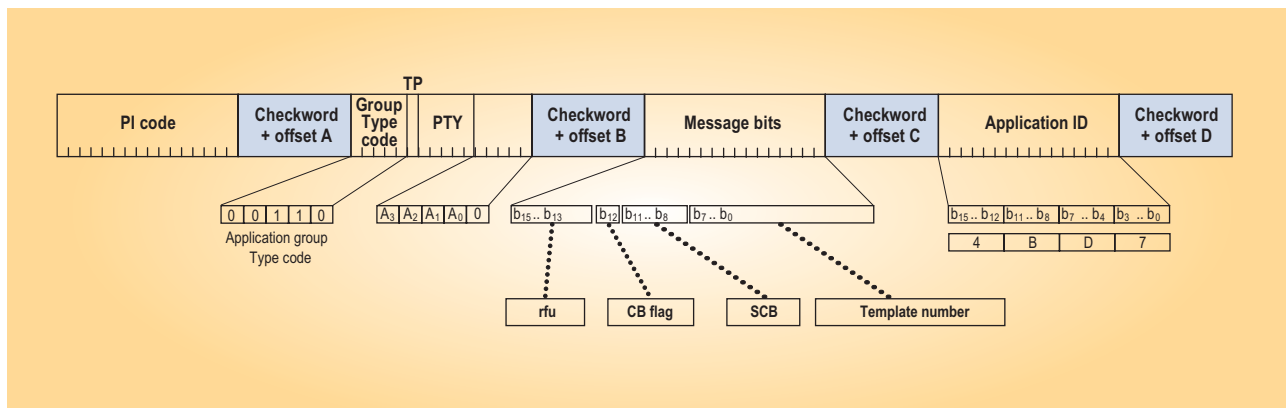
- **Item:** In popular music an “item” is a song. In classical music it may be a complete symphony. A speech-based programme may be assembled from different items.
- **Info:** Information and service.
- **Programme:** Content types describing the programme service.
- **Interactivity:** Telephone or SMS numbers, e-mail or web addresses.
- **Private classes:** Whereas all other classes describe precisely the content type, so that their interpretation by automatic routines within the terminal or by a human user is obvious, the *open classes* can be defined just according to the needs of a specific programme service provider. The interpretation is dependent on the programme service and may require appropriate clients on the receiver terminal.

Coding RT+ in RDS groups

To transmit the RT+ Tags, an Open Data Application [2] is used.

The Application Identification (AID) assigned for RT+ is 4BD7 (hex.). The message bits of group 3A bear control data for the application. The tag information to identify the RT+ information elements within the RT is conveyed in the application group. Only type "A" groups are used.

The coding of the message bits of group 3A (AI for the ODA RT+) is as follows:



Application group Type code:

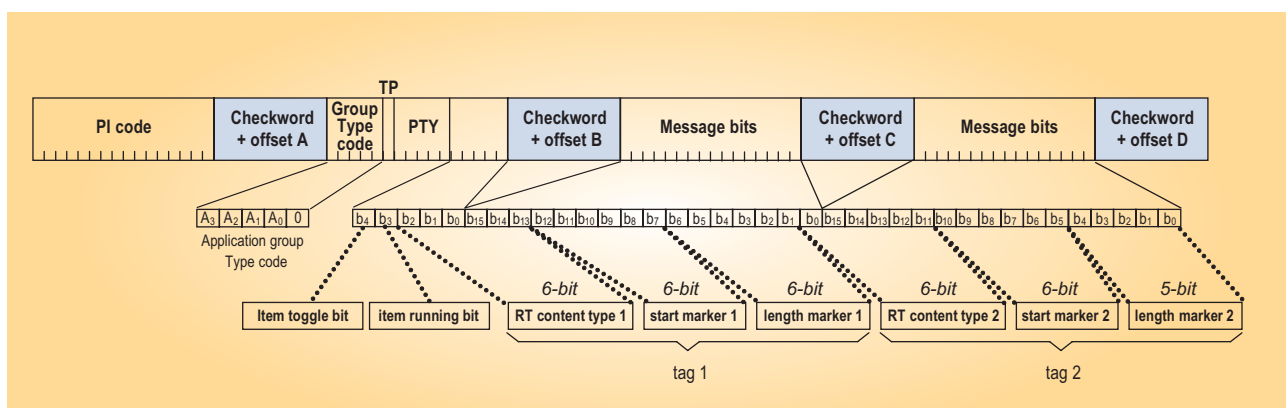
The group type for transmitting the RT+ application data can be chosen from Table 6 in IEC 62106 [2], Section 3.1.4.1. The group type code is signalled in block 2 of RDS group 3A.

The meaning of the message bits of group 3A is as follows:

- **rfu:** reserved for future use, the functions of the other bits are not affected. The rfu bits shall be set to zero until they are defined.
- **CB flag and Template number:** The CB flag informs the receiver if there is a template available for the ongoing programme. Please refer to [1] for more information
- **Server Control Bits (SCB):** It may occur that the same PI code is used repeatedly in a national area (e.g. for local programme stations far away from each other). In these cases, the Server Control Bits are used to distinguish programmes using the same PI code.

Coding of the RT+ Tag

In the message bits of the RT+ application group, a pair of RT+ tags is conveyed. All RT+ classes or content types can be put into one or the other tag of the application group.



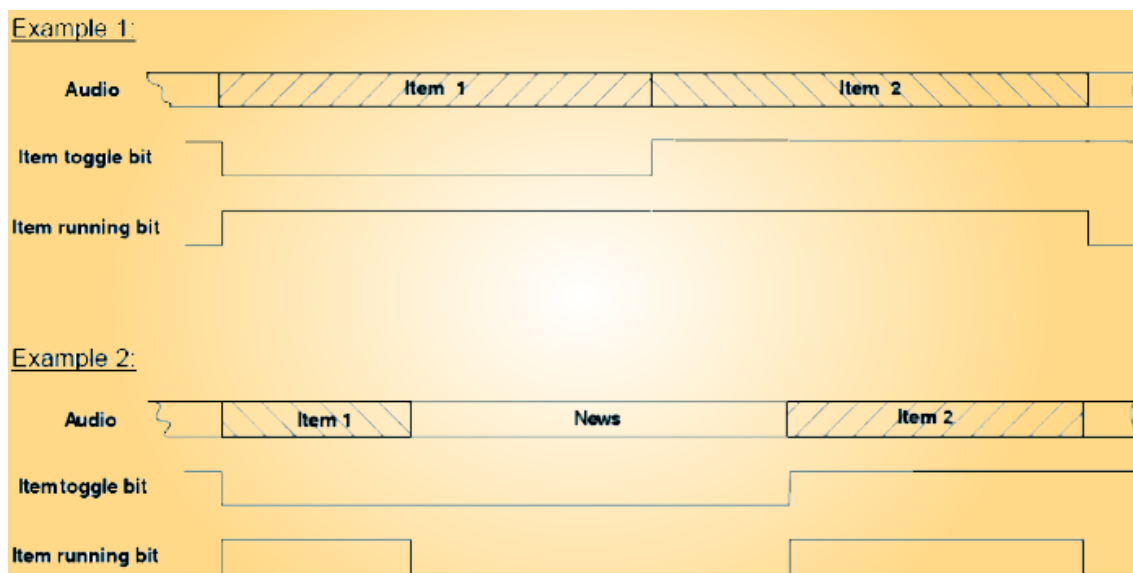
Abbreviations

AID	Application IDentification	DVB-S	DVB - Satellite
DAB	Digital Audio Broadcasting (Eureka-147) http://www.worlddab.org/	FM	Frequency Modulation
DRM	Digital Radio Mondiale http://www.drm.org/	ODA	Open Data Application
DVB	Digital Video Broadcasting http://www.dvb.org/	RT	(RDS) RadioText
		RT+	(RDS) RadioText Plus
		RDS	Radio Data System http://www.rds.org.uk/

The meaning of the message bits is as follows:

- **Item Toggle Bit:** This bit shall be toggled when a new item starts.
- **Item Running Bit:** This bit shall be set to “1” if an item is running. Otherwise it shall be set to “0”.
- **RT Content Type:** This 6-bit value specifies the tags by assigning a content type according to the class codes given in Table 6 in IEC 62106 [2], Section 3.1.4.1.
- **Start Marker:** This 6-bit value indicates the position of the first character of the RT+ information element within the RadioText.
- **Length Marker:** This 6-bit value (respectively 5-bit for Length Marker 2) gives the additional length of the RT+ information element.

Item Toggle Bit and Item Running Bit enable the receiver to show, for example, the list of earlier received programme items without mixing up RT+ elements belonging to different items. The following examples, taken from [1], show the usage of Item Running Bit and Item Toggle Bit:



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Hans-Christoph Quelle graduated in 1989 with a *Dipl.-Ing. Elektrotechnik* from the Technical University of Munich. In 1992, he received a Doctorate from *L'université de Rennes I (l'École Nationale Supérieure des Télécommunications)*

Since 1997, Dr Quelle has worked for Nokia GmbH in Germany in various Sales, Sales Development and Business Development positions in the Nokia Network, Nokia Multimedia Terminals and Nokia Home Communication divisions of the company. In 2005 he became Head of Narrowband Datacast and oversaw the development of RadioText Plus system described in this article.



Thomas Kusche works as Senior Editor at Westdeutscher Rundfunk. Within WDR Radio Management, he is responsible for Strategy and Planning in the field of Traffic Telematics, but is also involved in programme-driven developments in new Radio technologies. His professional background is journalist and he is particularly interested in finding practicable uses for new broadcast features – such as Radiotext Plus – which provide high value to the radio audience.

References

- [1] RDS doc. R05/036_1
RDS Forum, 2005
http://www.rds.org.uk/download/R05_036_1.pdf
 - [2] ODA: IEC 62106: **Specification of the radio data system (RDS) for VHF/FM sound broadcasting in the frequency range from 87,5 to 108,0 MHz**, Sections 3.1.4 and 3.1.5.4.
<http://domino.iec.ch/webstore/webstore.nsf/artnum/025877>
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