SRG SSR

Service Linking Implementation

Use Case Service Following in DAB Ensembles in Switzerland

Index

1. Goal and purpose

This text explains one use case and how it is intended to signal. While implementing this particular case certain problems have been detected. Parts of the related standards are being copied into this text.

1.1. Boundary

No changes to the existing standards are suggested in this document.

2. The use case

In one ensemble (EId 0x4001) are 7 (DAB+) services carrying the same content most of the day.

SRG SSR D01   EId 4001

Label Long	Label Short	Sid
SRF 1 AG SO+	SRF1 AG+	0x46B1
SRF 1 BE FR VS+	SRF1 BE+	0x44B1
SRF 1 BS+	SRF1 BS+	0x47B1
SRF 1 GR+	SRF1 GR+	0x4AB1
SRF 1 LU+	SRF1 LU+	0x45B1
SRF 1 SG+	SRF1 SG+	0x49B1
SRF 1 ZH SH+	SRF1 ZH+	0x48B1

Area 1
German speaking part of Switzerland

Some, not all, of these services are available in other ensembles in adjacent or non-adjacent coverage areas.

SRG SSR F01   EId 4041

Label Long	Label Short	Sid
SRF 1 BE FR VS+	SRF1 BE+	0x44B1

Area 2
French speaking part of Switzerland

SRG SSR I01   EId 4081

Label Long	Label Short	Sid
SRF 1 GR+	SRF1 GR+	0x4AB1

Area 3
Italian speaking part of Switzerland

SRG SSR R01   EId 40C1

Label Long	Label Short	Sid
SRF 1 GR+	SRF1 GR+	0x4AB1

Area 4
South-East region (Grisons)

During the time of identical audio, there is one FM service available in the same coverage areas using the **PI code 0x43B1**.
- All these DAB+ services shall be linked to this FM service.
- All these DAB+ services shall be linked to the same DAB+ service in other ensembles.

A linkage set LSN 0x001 is signalling this.

2.1. Standard Linking – no regionalization, LSN 001 active
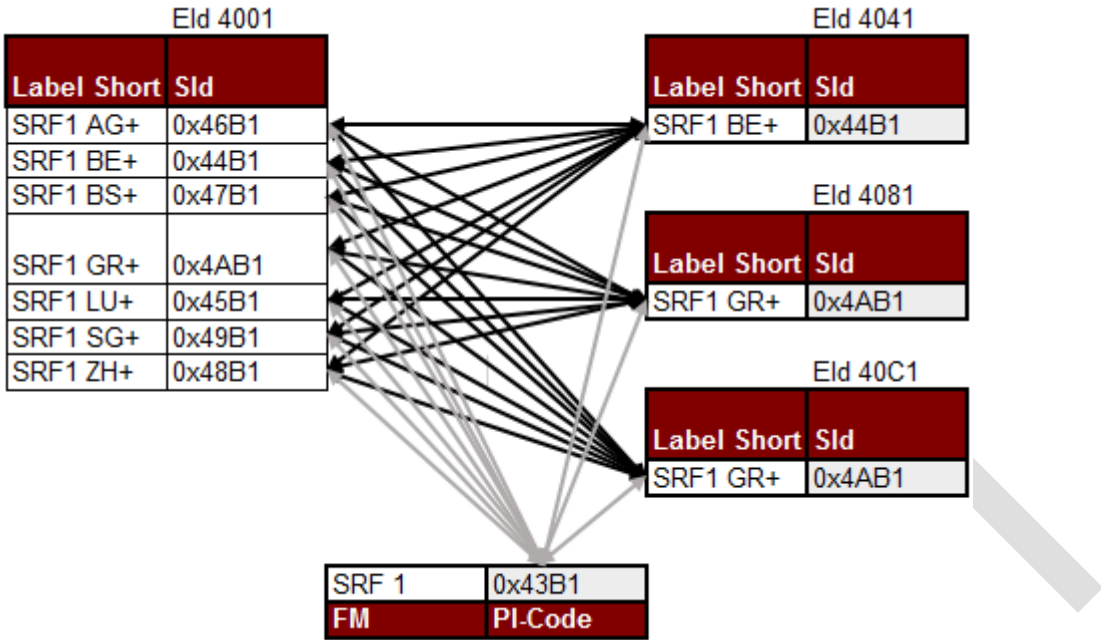
LSN 001 in ensemble EId 4001, 4081 and 40A1 (Screenshot IRT DABScout2, Version 1.3)

> ➤ Note: LSN 001 in Ensemble EId 4041 is different. The first Sld is 0x44B1, because this is the only service within this ensemble!

2.2. Regionalization

At the moment, these services become regional variants and the content becomes different, the linkage set LSN 001 will be switched off by setting the linkage actuator to "false" (LA flag).
At this moment, every service is carrying different audio and all FM stations change their PI code.
The linkage will look like this:
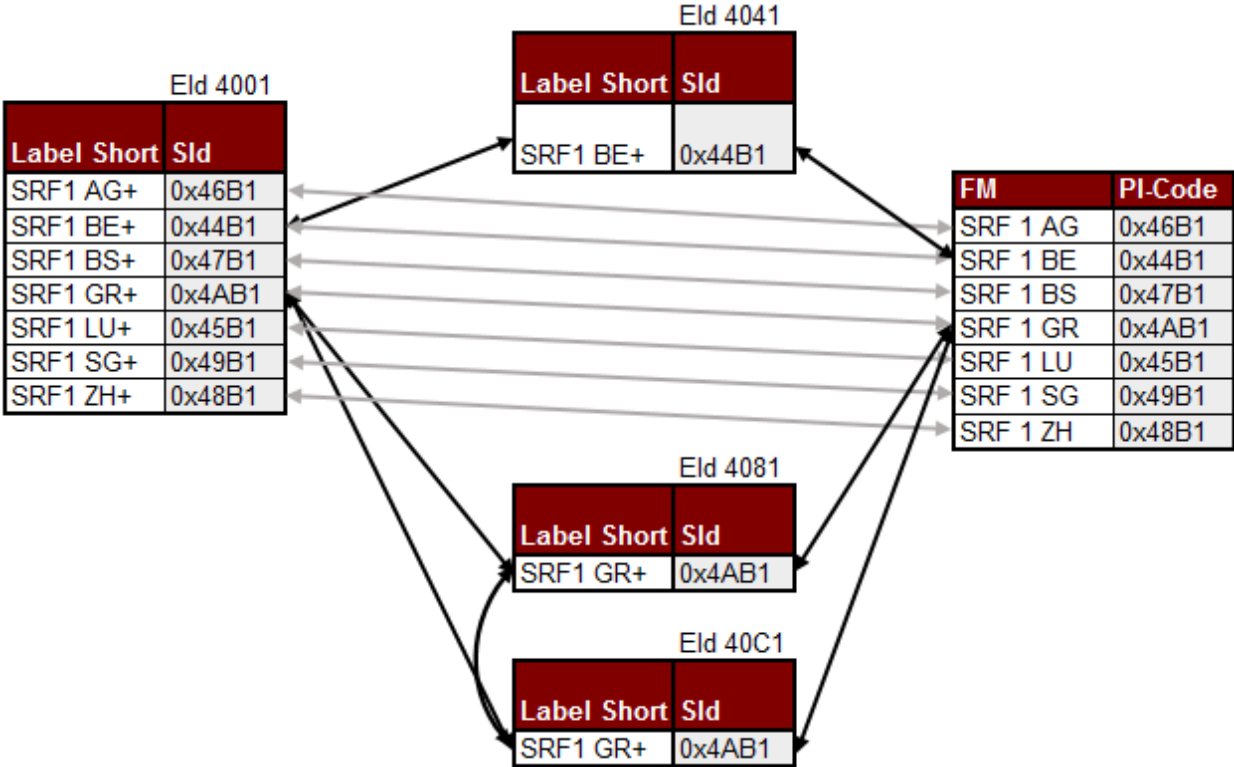
The times of regionalization are roughly:

- 6:30 … 6:45
- 7:30 … 7:45
- 8:10 … 8:25
- 12:00 … 12:20
- 17:30 … 18:10 (Monday to Friday & Sunday)
- 17:30 … 18:45 (Saturday)

During these times 7 different linkage sets are being enabled linking each of the seven DAB service to its related FM PI code. (*see rule 6)

Example of LSN 0x004 (Screenshot IRT DABScout2, Version 1.3)

3. The implementation

3.1. Standard

The standard ETSI TS 103176 (V2.1.1 (2017-08) defines some rules.

3.1.1. The rules

#	Rule	Passage of text
1	A linkage set is a <u>collection of identifiers</u> (DAB SIds, RDS PI codes, etc.) that correspond to <u>alternative sources</u> of the same content (hard link) or related content (soft link) - and is essentially static. However, a particular service may have different alternative sources at different times of the day. Each of these different situations can be represented by a different linkage set, each corresponding to a particular network configuration. All services in a linkage set are possible alternatives to each other when the linkage set is active.	[1] Clause 5.2.3
2	Each linkage set may be either <u>activated or deactivated</u> in order to reflect which is the current network configuration for the services carried in the ensemble.	[1] Clause 5.2.3
3	All services carrying <u>identical content</u> at a given time are grouped together in a <u>hard linkage</u> set.	[1] Clause 5.2.3
4	<u>All services</u> in a linkage set are <u>possible alternatives to each other</u> when the linkage set is active.	[1] Clause 5.2.3
5	All linkage sets <u>shall have one DAB SId</u>, and may also have other DAB SIds and RDS PI codes up to a maximum of 128 Ids in total.	[1] Clause 5.2.3
6	The **LSN**s shall be <u>coordinated between all broadcasters</u> in a particular country such that they are unique in combination with the flags (or internationally when the ILS flag is set).	[1] Clause 5.2.3
7	Linkage sets are activated and deactivated according to the state of the **LA flag**. When a linkage set is activated, receivers may switch to any of the alternate sources of the content; <u>when it is deactivated, they shall not</u>. This feature allows service providers to signal linkage sets in advance of their use and control the receiver linkage behaviour by changing the state of the **LA flag** for each linkage set.	[1] Clause 5.2.3
8	Of all the linkage sets defined <u>containing a particular service</u>, only one hard linkage set (either National or International) and one soft linkage set (either National or International) shall be activated at a given time; all other linkage sets defined containing that particular service shall be deactivated.	[1] Clause 5.2.3
10	The transmission <u>order</u> of the identifiers in the linkage set shall be determined <u>according to the following sequence</u>: 1) The SId(s) of the DAB service(s) carried in the ensemble. 2) The SId(s) of the DAB service(s) carried in geographically adjacent ensembles. 3) The SIds of all other DAB services. 4) The PI code(s) of the RDS service(s) available in the coverage area of the ensemble. 5) The PI code(s) of the RDS service(s) available in the coverage area of geographically adjacent ensembles. 6) The PI codes of all other RDS services.	[2] Clause 5.2.3
11	Once <u>the transmission order</u> is determined for each ensemble, it <u>shall not be changed</u>.	[2] Clause 5.2.3

12	The identifier list shall be divided into FIG 0/6s carrying **service linking** fields.	[3] Clause 5.2.4.1
13	A start of database FIG 0/6 (**C/N** = 0) contains a **service linking** field with: **IdLQ** is set to 00 [DAB SIds] and the **Id list** consists of DAB SIds. Then a continuation of database FIG 0/6 (**C/N** = 1) contains a **service linking** field with: **IdLQ** is set to 01 [RDS PI codes] and the **Id list** containing RDS PI codes.	[3] Clause 5.2.4.1
14	A DAB service may be carried on different ensembles. In this case, service providers may assist receivers by providing the EIds of the other ensembles using FIG 0/24 and may provide the Frequency Information for each ensemble using FIG 0/21.	[4] Clause 5.5.1
15	Service providers may localize or regionalize their content on one or both bearers, the relationship between services carrying identical audio content may vary during the day. Each possible combination of DAB SId and RDS PI codes is expressed by a linkage set and as the day progresses and the different combinations become valid, the LA of each linkage set is either activated or deactivated.	[5] Clause 5.5.2
And ETSI EN 300 401 V2.1.1 (2017-01) defines the following rule		
16	The first service in the list of services in each part of the database, as divided by the database key, shall be a service carried in the ensemble. This service is called the key service.	[6] Clause 8.1.15

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Passage of text 1

5.2.3 Linkage sets

A linkage set is a collection of identifiers (DAB SIds, RDS PI codes, etc.) that correspond to alternative sources of the same content (hard link) or related content (soft link) - effectively a linkage set represents a particular transmission network configuration and so is essentially static. However, a particular service may have different alternative sources at different times of the day. Each of these different situations can be represented by a different linkage set, each corresponding to a particular network configuration. Each linkage set may be either activated or deactivated in order to reflect which is the current network configuration for the services carried in the ensemble.

All services carrying identical content at a given time are grouped together in a hard linkage set.

All services carrying related content at a given time are grouped together in a soft linkage set.

> NOTE: All services in a linkage set are possible alternatives to each other when the linkage set is active.

All linkage sets shall have one DAB SId, and may also have other DAB SIds, RDS PI codes, DRM SIds and AMSS SIds up to a maximum of 128 Ids in total.

Linkage sets are identified using the LSN field in combination with three flags: the **P/D flag**, the **Soft/Hard (S/H) flag** and the **International Linkage Set (ILS) flag**. The LSNs shall be coordinated between all broadcasters in a particular country such that they are unique in combination with the flags (or internationally when the ILS flag is set).

Linkage sets are activated and deactivated according to the state of the **LA flag**. When a linkage set is activated, receivers may switch to any of the alternate sources of the content; when it is deactivated, they shall not. This feature allows service providers to signal linkage sets in advance of their use and control the receiver linkage behaviour by changing the state of the **LA flag** for each linkage set.

The linkage set definitions reflect different broadcast network configurations. If for a particular service, the alternative sources remain the same throughout the day, week and year, then only one linkage set is needed and it will be activated at all times. For other services there may be different alternatives at different times of day that reflect the programming needs of the service provider. Each broadcast network configuration is represented by a different linkage set, and each of these are defined and allocated an identifier - the LSN in combination with the three flags. As the day progresses and each different network configuration becomes valid, a different linkage set is activated to inform receivers of the valid alternatives. In this way the database information built up by the receivers remains static, but the validity of a particular broadcast network configuration is controlled dynamically by the indication of which linkage set is active.

Of all the linkage sets defined containing a particular service, only one hard linkage set (either National or International) and one soft linkage set (either National or International) shall be activated at a given time; all other linkage sets defined containing that particular service shall be deactivated.

Passage of text 2

For each ensemble that transmits a linkage set, the transmission order of the identifiers in the linkage set shall be determined according to the following sequence:

1) The SId(s) of the DAB service(s) carried in the ensemble.

2) The SId(s) of the DAB service(s) carried in geographically adjacent ensembles.

3) The SIds of all other DAB services.

4) The PI code(s) of the RDS service(s) available in the coverage area of the ensemble.

5) The PI code(s) of the RDS service(s) available in the coverage area of geographically adjacent ensembles.

6) The PI codes of all other RDS services.

7) The SId(s) of the DRM or AMSS service(s) available in the coverage area of the ensemble.

8) The SId(s) of the DRM or AMSS service(s) available in the coverage area of geographically adjacent ensembles.

9) The SIds of all other DRM or AMSS services.

Once the transmission order is determined for each ensemble, it shall not be changed unless the members of the linkage set change.

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Passage of text 3

5.2.4.1 Defining a linkage set

The transmission order list of the linkage set for the tuned ensemble is determined in the planning stage (see clause 5.2.3).

The identifier list shall be divided into FIG 0/6s carrying **service linking** fields according to the following cases:

Step A: a start of database FIG 0/6 (C/N = 0) contains a **service linking** field with:

- *if* the transmission order list contains one DAB SId only (a dead link): the **IdLQ** is set to 01 [RDS PI codes] and the first and only **Id** in the list is the DAB SId (key service).

- *else if* the transmission order list contains one DAB SId and one or more RDS PI codes (and optionally one or more DRM/AMSS SIds): the **IdLQ** is set to 01 [RDS PI codes] and the first **Id** in the list is the DAB SId (key service) and all other **Ids** are RDS PI codes.

ETSI

19   ETSI TS 103 176 V2.1.1 (2017-08)

- *else if* the transmission order list contains one DAB SId and one or more DRM or AMSS SIds: the **IdLQ** is set to 11 [DRM or AMSS SIds], the first **Id** in the list is the DAB SId (key service) and all other **Ids** are DRM or AMSS SIds.

- *else* the **IdLQ** is set to 00 [DAB SIds] and the **Id** list consists of as many DAB SIds as will fit into the FIG following the transmission order list of the ensemble (it is recommended to include as many **Ids** as will fit, up to the full capacity of an FIB, for this FIG 0/6).

Step B: if the transmission order list contains untransmitted **Ids** then a continuation of database FIG 0/6 (C/N = 1) contains a **service linking** field with:

- *if* there are DAB SIds to signal: the **IdLQ** is set to 00 [DAB SIds] and the **Id** list contains as many DAB SIds as will fit into the FIG following the transmission order list of the ensemble.

- *else if* there are RDS PI codes to signal: the **IdLQ** is set to 01 [RDS PI codes] and the **Id** list contains as many RDS PI codes as will fit into the FIG following the transmission order list of the ensemble.

- *else* there are DRM or AMSS SIds to signal: the **IdLQ** is set to 11 [DRM or AMSS SIds] and the **Id** list contains as many DRM or AMSS SIds as will fit into the FIG following the transmission order list of the ensemble.

Service Linking Implementation, Use Case Service Following in DAB Ensembles in Switzerland, 4.0, April 17, 2018, Klaus Probst   10 / 20

RSI RTR RTS SRF SWI

Passage of text 4

5.5.1 DAB / DAB service following

There is no such thing as a "standard" DAB network. Depending on very many variables, networks will be built that provide the radio services that are needed. Some examples are listed below. In all cases, it is essential that proper allocation of identifiers is made such that there are no conflicts of information within the country.

A DAB service may be carried in an ensemble which is transmitted on different frequencies. In this case, service providers may assist receivers by providing the Frequency information for the ensemble using FIG 0/21. Clause A.1 illustrates this use case.

Another DAB service may be carried on different ensembles. In this case, service providers may assist receivers by providing the EIds of the other ensembles using FIG 0/24 and may provide the Frequency Information for each ensemble using FIG 0/21. Clause A.2 illustrates this use case.

Passage of text 5

5.5.2 DAB / FM-RDS service following

In order to allow receivers to continue to provide a service carried on DAB when moving beyond the digital coverage area, service providers with the same content available from FM-RDS can provide service following information. In general, FIG 0/6 is used to provide the linkage between DAB services and the corresponding FM-RDS services; this is illustrated in clause A.6. In the special case that identical content is carried on DAB and FM-RDS and the SId and PI code are identical, then a service provider can chose not to signal any FM-RDS service linking information, relying instead on implicit linking. In this case no service linking information is signalled and the receiver may switch between the DAB and FM-RDS sources as determined by algorithms in the receiver. Implicit linking cannot cope with regionalization using PI code switching - an example is illustrated in clause A.7, nor the case where the content on DAB and FM-RDS is not identical at certain times of day - this is illustrated in clause A.8. For these cases, FIG 0/6 is used to define a hard linkage set that overrides implicit linking when activated.

Because the coverage of DAB and FM transmissions may be different, and service providers may localize or regionalize their content on one or both bearers, the relationship between services carrying identical audio content may vary during the day. Each possible combination of DAB SId and RDS PI codes is expressed by a linkage set and as the day progresses and the different combinations become valid, the LA of each linkage set is either activated or deactivated. In this way, the database entries remain constant, but the active alternative services are dynamically controlled. There are very many possible combinations.

There may be situations where allocation of SIds and PI codes has not been coordinated and service providers with no FM-RDS services may find receivers that implement implicit linkage switch listeners from DAB to FM-RDS but the two services have different content. To prevent this condition, service providers may signal an FM-RDS link without any PI codes - this is an example of a "dead link" and is illustrated in clause A.9, which shows linked DAB services without links to the corresponding FM-RDS services.

Passage of text 6

8.1.15 Service linking information

The Service linking information feature provides service linking information for use when services carry the same primary service component (hard link) or when the primary service components are related (soft link). The feature is encoded in extension 6 of FIG type 0 (FIG 0/6). Figure 53 shows the structure of the service linking field which is part of the Type 0 field (see also figure 7).

The FIG type 0 flags (see clause 5.2.2.1) are used as follows: C/N flag - SIV; OE flag - Rfu; P/D flag - P/D.

This feature shall use the SIV signalling (see clause 5.2.2.1). The database shall be divided by use of a database key. Changes to the database shall be signalled using the CEI. The first service in the list of services in each part of the database, as divided by the database key, shall be a service carried in the ensemble. This service is called the key service.

Service linking information forms part of the signalling used for service following, which is described in detail in ETSI TS 103 176 [5].

ETSI

85   ETSI EN 300 401 V2.1.1 (2017-01)

3.2. Linkage Sets "non regional"

Following all the rules, the result are the following linkage sets.

3.2.1. Ensemble 0x4001 (Area 1)

LSN 0x001 (active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x004 (in-active, hard, national)
SId's: 0x44B1
PI's: 0x44B1

LSN 0x005 (in-active, hard, national)
SId's: 0x45B1
PI's: 0x45B1

LSN 0x006 (in-active, hard, national)
SId's: 0x46B1
PI's: 0x46B1

LSN 0x007 (in-active, hard, national)
SId's: 0x47B1
PI's: 0x47B1

LSN 0x008 (in-active, hard, national)

SId's: 0x48B1
PI's: 0x48B1

LSN 0x009 (in-active, hard, national)
SId's: 0x49B1
PI's: 0x49B1

LSN 0x00A (in-active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.2.2. Ensemble 0x4041 (Area 2)

LSN 0x001 (active, hard, national)
SId's: 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1, 0x4AB1
PI's: 0x43B1

LSN 0x004 (in-active, hard, national)
SId's: 0x44B1
PI's: 0x44B1

3.2.3. Ensemble 0x4081 (Area 3)

LSN 0x001 (active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x00A (in-active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.2.4. Ensemble 0x40C1 (Area 4)

LSN 0x001 (active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x00A (in-active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.3. Linkage Sets "regional"

3.3.1. Ensemble 0x4001 (Area 1)

LSN 0x001 (in-active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x004 (active, hard, national)
SId's: 0x44B1
PI's: 0x44B1

LSN 0x005 (active, hard, national)

Service Linking Implementation, Use Case Service Following in DAB Ensembles in Switzerland, 4.0, April 17, 2018, Klaus Probst   13 / 20

RSI RTR RTS SRF SWI

SId's: 0x45B1
PI's: 0x45B1

LSN 0x006 (active, hard, national)
SId's: 0x46B1
PI's: 0x46B1

LSN 0x007 (active, hard, national)
SId's: 0x47B1
PI's: 0x47B1

LSN 0x008 (active, hard, national)
SId's: 0x48B1
PI's: 0x48B1

LSN 0x009 (active, hard, national)
SId's: 0x49B1
PI's: 0x49B1

LSN 0x00A (active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.3.2. Ensemble 0x4041 (Area 2)

LSN 0x001 (in-active, hard, national)
SId's: 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1, 0x4AB1
PI's: 0x43B1

LSN 0x004 (active, hard, national)
SId's: 0x44B1
PI's: 0x44B1

3.3.3. Ensemble 0x4081 (Area 3)

LSN 0x001 (in-active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x00A (active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.3.4. Ensemble 0x40C1 (Area 4)

LSN 0x001 (in-active, hard, national)
SId's: 0x4AB1, 0x44B1, 0x45B1, 0x46B1, 0x47B1, 0x48B1, 0x49B1
PI's: 0x43B1

LSN 0x00A (active, hard, national)
SId's: 0x4AB1
PI's: 0x4AB1

3.4. The result in ensemble 0x4001

Start of database:

FIG Header		
FIG Type	3 bits	0
Length of FIG data field	5 bits	18

FIG Type 0 - MCI and SI

C/N flag	1 bit	false	
OE flag	1 bit	false	
P/D flag	1 bit	false	Programme service
Extension	5 bits	6	

FIG 0/6 - Service Linking information

FIG 0/6

Id list flag	1 bit	true	Id list present
LA	1 bit	true	active link
S/H	1 bit	true	Hard link (service carrying the same primary service component)
ILS	1 bit	false	National link
LSN	12 bits	0x001	
Rfu1	1 bit	0x0	
IdLQ	2 bits	0x0	Each Id represents a DAB SId
Shd	1 bit	false	Ids in the Id list represent a single service
Number of Ids	4 bits	7	

Array

FIG 0/6 Id list

SId	16 bits	0x4AB1

FIG 0/6 Id list

SId	16 bits	0x44B1

FIG 0/6 Id list

SId	16 bits	0x45B1

FIG 0/6 Id list

SId	16 bits	0x46B1

FIG 0/6 Id list

SId	16 bits	0x47B1

FIG 0/6 Id list

SId	16 bits	0x48B1

FIG 0/6 Id list

SId	16 bits	0x49B1

RSI RTR RTS SRF SWI

followed by continuation of database

Property	Size	Value
FIG Header		
FIG Type	3 bits	0
Length of FIG data field	5 bits	6
FIG Type 0 - MCI and SI		
C/N flag	1 bit	true
OE flag	1 bit	false
P/D flag	1 bit	false
Extension	5 bits	6
FIG 0/6 - Service Linking information		
FIG 0/6		
Id list flag	1 bit	true
LA	1 bit	true
S/H	1 bit	true
ILS	1 bit	false
LSN	12 bits	0x001
Rfu1	1 bit	0x0
IdLQ	2 bits	0x1
Shd	1 bit	false
Number of Ids	4 bits	1
Array		
FIG 0/6 Id list		
SId	16 bits	0x43B1

PI ! ?

3.5. Problem 1

With this signalling, some receivers will not link the FM service to the DAB services!

These receivers probably are interpreting the Id in the continuation part of the database as a SId and not as a PI code, hence reading this as a "dead link". This is the case with the above used FIG analyser.

3.6. Problem 2

Some receivers do only take the first SId in the list as a "key" service!
All other SId's in the list are interpreted as targets, so in Ensemble 0x4001 only the service 0x4AB1 will be linked to the related service in the other ensembles or to the FM PI-code 0x43B1.

3.7. Problem 3

LSN 0x001 cannot keep the order of the SId's constant in *all* ensembles. The first SId in the list of SId's at the "start of database" shall be a DAB SId of a service carried in the tuned ensemble.
- Ensemble 0x4041 contains only the DAB service 0x44B1 – so this SId must be the first.
- Ensembles 0x4081 and 0x40C1 contains only the DAB service 0x4AB1 - so this SId must be the first.

So, receivers travelling from area 1, 3 or 4 to area 2 will receive a LSN 0x001 with a different order of SId's.

4. Tests, Checks

The tests listed below can be performed in the area but check the regionalization times in clause 2.1.

4.1. DAB – DAB Linking LSN 0x001 active (no regionalization)

Test Id	Tuned to	Travelling from - to	After leaving the initial coverage area, the receiver is tuned to	Result
1.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
1.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
2.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
2.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
3.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	
3.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	

4.1	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x44B1 (preferred)	
4.2	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x45B1 (possible)	
4.3	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x46B1 (possible)	
4.4	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x47B1 (possible)	
4.5	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x48B1 (possible)	
4.6	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x49B1 (possible)	
4.7	Eid 0x4041 Sid 0x44B1	Eid 0x4041 (area 2) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x4AB1 (possible)	
5.1	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x44B1 (possible)	
5.2	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x45B1 (possible)	
5.3	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x46B1 (possible)	
5.4	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x47B1 (possible)	
5.5	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x48B1 (possible)	
5.6	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x49B1 (possible)	
5.7	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x4AB1 (preferred)	
6.1	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x44B1 (possible)	
6.2	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x45B1 (possible)	
6.3	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x46B1 (possible)	
6.4	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x47B1 (possible)	
6.5	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x48B1 (possible)	
6.6	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x49B1 (possible)	
6.7	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4001 (area 1)	Eid 0x4001 Sid 0x4AB1 (preferred)	
7.1	Eid 0x4081 Sid 0x4AB1	Eid 0x4081 (area 3) to Eid 0x40C1 (area 4)	Eid 0x40C1 Sid 0x4AB1	
8.1	Eid 0x40C1 Sid 0x4AB1	Eid 0x40C1 (area 4) to Eid 0x4081 (area 3)	Eid 0x4081 Sid 0x4AB1	

4.2. DAB – DAB Linking LSN 0x001 inactive

Test Id	Tuned to	Travelling from - to	After leaving the initial coverage area, the receiver is tuned to	Result
10.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	EId 0x4041 SId 0x44B1	
10.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
10.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
10.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
10.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
10.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
10.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x4041 (area 2)	Loss of reception	
11.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	Loss of reception	
11.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x4081 (area 3)	EId 0x4081 SId 0x4AB1	
12.1	EId 0x4001 SId 0x44B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.2	EId 0x4001 SId 0x45B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.3	EId 0x4001 SId 0x46B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.4	EId 0x4001 SId 0x47B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.5	EId 0x4001 SId 0x48B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.6	EId 0x4001 SId 0x49B1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	Loss of reception	
12.7	EId 0x4001 SId 0x4AB1	EId 0x4001 (area 1) to EId 0x40C1 (area 4)	EId 0x40C1 SId 0x4AB1	

13.1	EId 0x4041 SId 0x44B1	EId 0x4041 (area 2) to EId 0x4001 (area 1)	EId 0x4001 SId 0x44B1	

4.3. DAB – FM Linking LSN 0x001 active
4.4. DAB – FM Linking LSN 0x001 inactive

5. Document-History

Change control

Version	Date	Author(s)	Description of change	Status
0.1	February 7, 2017	Klaus Probst	Initial draft	In Arbeit
3.0	April 21, 2017	Klaus Probst	Reworked Version	
4.0	April 17, 2018	Klaus Probst	Referenced to updated standards	

Review and approval

Version	Date	Name	Task	Visum
4.0	April 17, 2018	Klaus Probst	check	KP, released
		Area Head of department	check	
		Head	check and release	

RSI RTR RTS SRF SWI