

# WorldDAB Automotive – DAB Digital Radio In Car User Experience Design Guidelines



1. Background
  - a) WorldDAB
  - b) Radio in-car
  - c) UX Group
2. WorldDAB in-car DAB user experience research
3. Consumer use cases
4. Design guidelines
5. Future user experience work
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## 1. Background – Radio in-car

- Consumers love radio in their cars:
  - 82% of people wouldn't buy a car without a radio\*
  - 75% of all audio consumed in the car is live radio\*
  - 84% of people “always” or “mostly” listen to the radio on every journey\*
- People are increasingly choosing to listen digitally *Insert listening data*
- Radio in-car is going digital:
  - 4.6 Million cars were sold with DAB in 2016. 39% more than in 2015
  - In Norway (98%), The UK (87.5%) and Switzerland (66%), cars have DAB as standard
  - Fast growth in: Netherlands (+26%), Germany (+21%), France (+16%), Australia ( %)\*\*
- As more people enjoy DAB digital radio in their cars, broadcasters and car manufacturers need to ensure it is a great experience

# 1. Background – In-car user experience group

- The WorldDAB in-car user experience group was formed in 2016 to improve the user interface for in-car digital radios and:
  - Produce collaborative broadcast/car manufacturer user interface design guidelines
  - Identify and action the collaboration required between broadcasters and car manufacturers to improve and innovate UI design
  - Understand how future technology will impact on UI design
- The Group believes that we must put the consumer UX at the heart of the design process
- Group members include broadcasters from across Europe and Australia, leading car manufacturers and in-car technology providers.
- This is an unprecedented collaboration between broadcasters and car manufacturers to ensure the best radio experience possible in-car. To find out more about the group and how to join please contact [rosemary.smith@worlddab.org](mailto:rosemary.smith@worlddab.org)

# 1. Background – Document status and future work

This document constitutes Phase 1 of an ongoing project to help improve the user experience of DAB digital radio in-car. Please note:

- This document is live and may change over time as feedback is received from stakeholders and partners. Please ensure you have the latest version number from World DAB
- The focus of Phase 2 will be determined by the World DAB UX Group. Focus areas are likely to include:
  - Terminology - Advising on consistent terminology to be used by both car manufacturers and broadcasters
  - Hybrid radio including DAB
  - Voice controlled DAB radio

## 2. WorldDAB in-car DAB user experience research

Radio UX  
In Car

- The user experience group conducted the first ever qualitative consumer research on the DAB digital radio user interface in-car across five European markets: Germany, UK, France, The Netherlands and Belgium.
- The research summary, full findings and consumer videos can be seen here [XXX](#)
- The headline findings were:
  - Drivers expect a great, simple UX
  - A radio button is essential to access DAB easily and quickly
  - An A-Z station list is the best search UX
  - Pre-sets should be easy to set and the process must be consistent and explained
  - Terminology must be easier to understand
- There was a high level of consistency in the consumer responses between regions

### 3. Consumer use cases

Informed by the research and discussion within the UX group, a number of consumer use-cases have been identified. If delivered together, they form a great, easy to use UI and provide a structure for the design guidelines:

**I want.....**

**1. to find DAB radio easily in the car media system**

**2. to find DAB stations easily**

**3. the list of stations to be up to date**

**4. to be able to easily set a station as a pre-set**

**5. To keep listening to my station if it's available**

**6. to know more about what I'm listening to**

**7. my DAB radio to be set up for me**

## 4. Design guidelines

For each consumer use case the associated design guideline follows the same structure:

- The current consumer problems and research references
- What consumers want
- Consumer quotes
- Design guideline
- Hardware requirements and/or Technical references
- Visual example of how the guidelines could be implemented (unless not required)



## 4. Design guidelines – Guiding principles

- Design guidelines must be based on consumer use cases and what they want
- Every car manufacturer will design their own radio UI but guidelines are helpful
- Broadcasters and manufacturers must both follow the guidelines to deliver a great UX
- Keys/buttons should have consistent behaviour between FM and DAB
- For ease of use and to avoid driver distraction, actions and navigation should require the least number of button presses and menu layers as possible
- To ensure DAB performance enhances a great UX, dual DAB tuners and a good DAB antenna implementation are required\*

## 4.1 I want to find DAB radio easily in the car media system



## 4.1 I want to find DAB radio easily in the car media system

### Consumer problems and research references:

- In cars without a “Radio” button on the dashboard or screen, most consumers find it frustrating and difficult to find the DAB radio quickly\*
- This could cause driver distraction and impact safety
- When consumers want to move from listening to AM/FM to DAB they find it difficult to do\*

### Consumers want:

- A quick, easy and safe way to access the DAB radio. Research shows that cars with a “Radio” button provide this solution.

### Consumer quote:

*“There are a lot of arrows on the dashboard....there was nothing to direct me to radio”*

## 4.1. I want to find DAB radio easily in the car media system

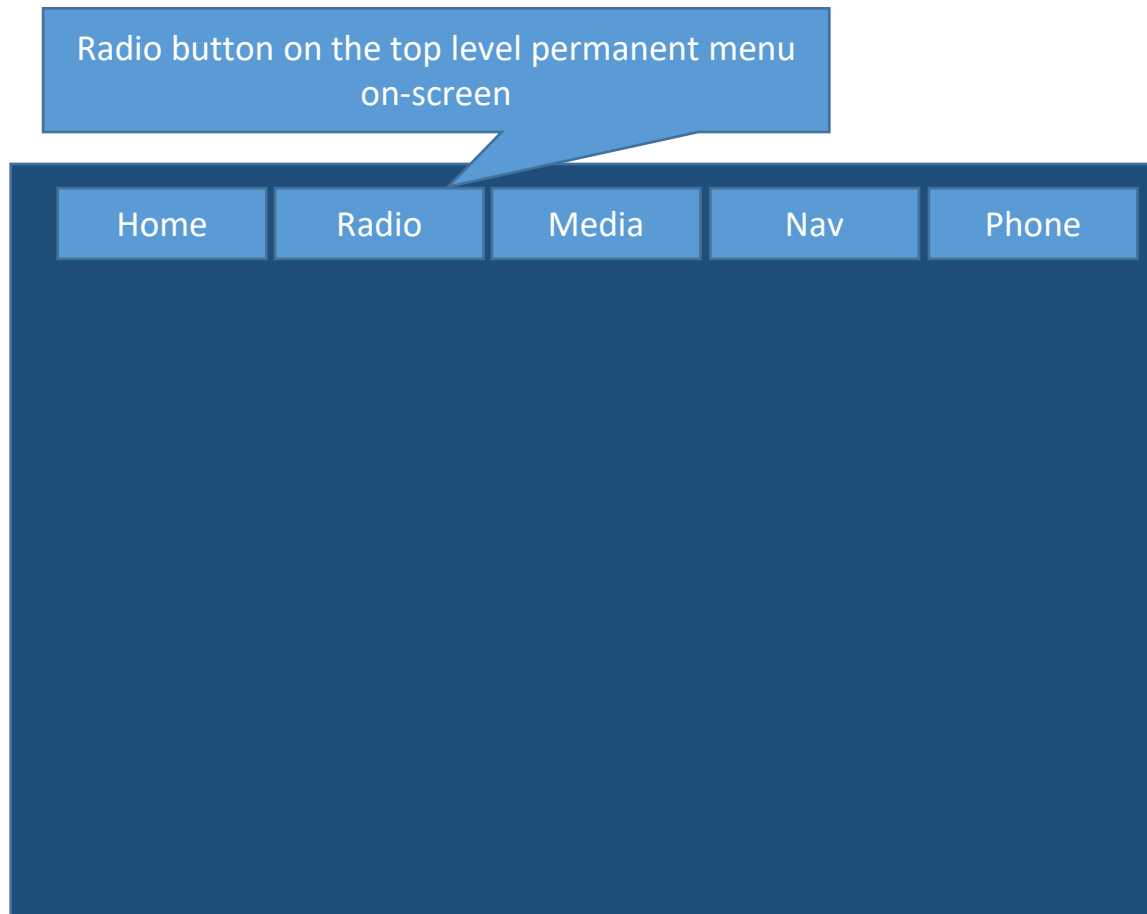
Radio UX  
In Car

### Design guidelines:

- Include a permanent “Radio” button on the dashboard or the top level menu on the screen.
- Selecting “Radio” should default to DAB (when it is available) or go to a menu where radio platforms can be chosen
- In a hybrid radio the best platform signal will be automatically selected
- When listening to AM/FM, include a “DAB” button on the screen.

### Hardware/ technical reference:

## 4.1. Example - I want to find DAB radio easily in the car media system



## 4.2 I want to find DAB stations easily



## 4.2 I want to find DAB stations easily

### Consumer problems and research references:

- Finding stations by multiplex can be difficult, confusing, and in some cases impossible\*
- An A-Z station list of DAB stations provides the best experience for finding stations\*
- Consumers may value the ability to search for specific stations via alphabetical characters

### Consumers want:

- A quick, easy and safe way to search for and find their DAB stations that does not require knowledge of the DAB broadcast network. Research shows that an A-Z station list provides this.

### Consumer quote:

*“Once I’d found DAB radio I was thinking i’d be able to find stations by searching through a list within the DAB part but what I needed to was find another menu which I didn’t realise”*

## 4.2 I want to find DAB stations easily

### Design guidelines:

- Present an integrated and unified A-Z list of all available stations (FM, DAB, IP) which defaults to DAB *or* present an A-Z list of all available DAB stations
- Optional: It may also be useful to offer an A-Z list of alphabetic characters where consumers can choose the first letter of their wanted station and be presented with all available stations starting with that letter
- Note: Most users will not use ensemble information or channel codes, and don't understand them, if they are shown within the station list

### Hardware /technical requirements:

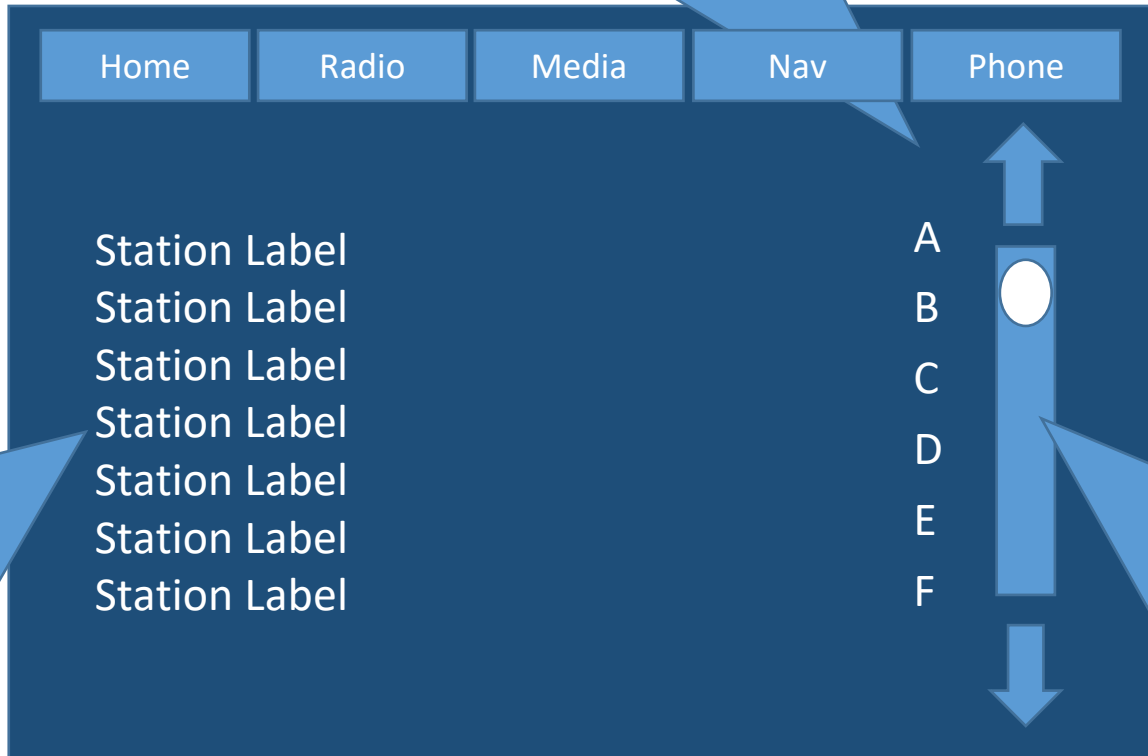
- Delivering a dynamic, accurate A-Z station list requires dual DAB tuners
- For an integrated, unified station list use Radio DNS open standards: <https://radiodns.org/>



## 4.2 Example - I want to find DAB stations easily

Alphabetical character list which takes you to all stations whose name begins with that letter

A-Z station list of available stations. Dynamic updates made upon starting the car and then as new stations become available and existing stations are lost. Station labels 8-16 characters



Assumes touch-screen scrolling is available. Physical scrolling wheel/button also available for search

## **4.3 I want the list of stations to be up to date**



## 4.3 I want the list of stations to be up to date

### Consumer problems and research references:

- The World DAB UX Group believes it is a poor experience for consumers to be presented with stations that aren't available to them. This can be confusing and annoying if the station is selected but is unavailable

### Consumers want:

- Their list of DAB stations to include all available stations and be current and dynamically updated.

### Consumer quotes:

*"I don't understand why the radio offered a station to me and then it wasn't even there?"*

## 4.3 I want the list of stations to be up to date

### Design guidelines:

- The station list should be automatically updated when new stations become available or unavailable
- Note: Pre-sets should remain even if service is unavailable

### Hardware/technical references

- Delivering a dynamic, accurate A-Z station list requires dual DAB tuners
- ETSI 103176 V. 2.1.1

## **4.4 I want to be able to easily set a station as a pre-set**



## 4.4 I want to be able to easily set a station as a pre-set

### Consumer problems and research references:

- Research showed that 36% of people found it difficult or impossible to set a pre-set\*
- Those consumers who found it difficult had typically not set a pre-set before on a DAB radio at home or in a car, so had no experience of pressing-and-holding buttons to set pre-sets. Those that found it easy knew to try this method.

### Consumers want:

- To be able to set DAB station pre-sets as it makes using the radio easier and safer.
- The action to set pre-sets to be consistent across all radio platforms and radios (at home and in the car).

### Consumer quotes:

*“I didn’t know where to go on the menu. Maybe it should have a ‘+’ sign somewhere?”*

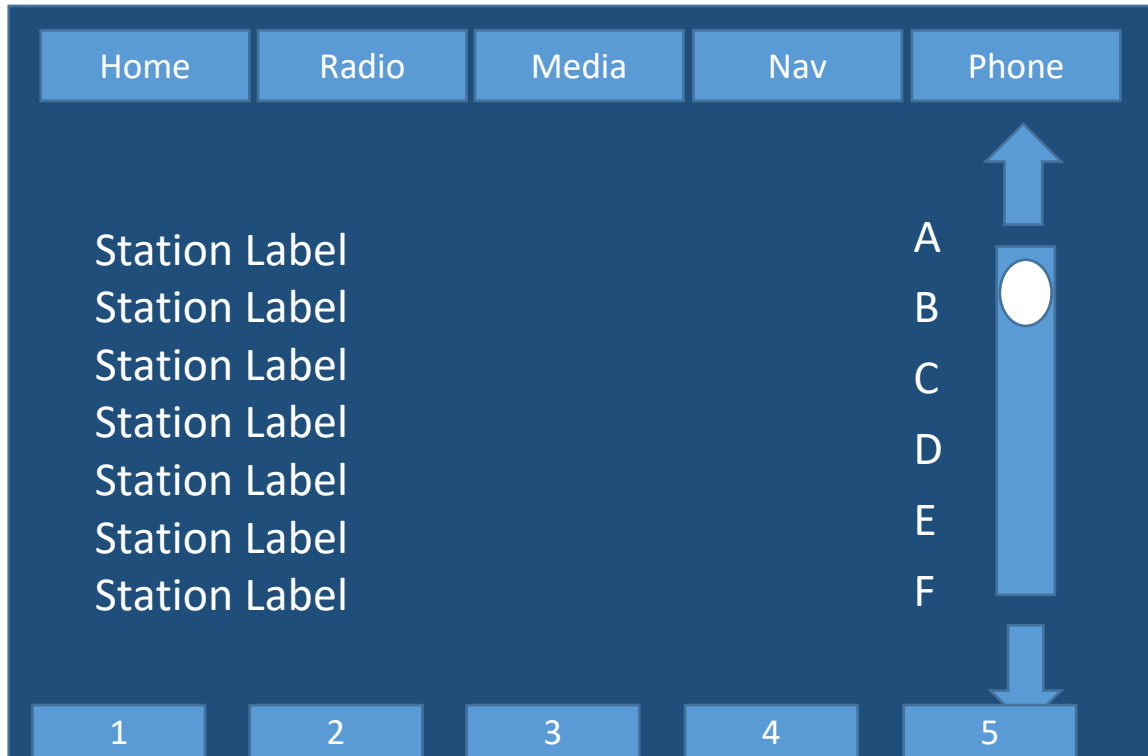
## 4.4 I want to be able to easily set a station as a pre-set

### Design guidelines:

- The action to set a DAB pre-set should always be to press and hold a button when listening to the wanted station
- If the media system has physical numbered buttons, these should be used to press and hold when listening to the wanted station.
- If the media system has touch-screen soft keys, these should be numbered or clearly marked as pre-set buttons.
- Ensure clear instructions in the user manual for setting pre-sets
- Optional: If possible, on-screen prompts describing how to set a pre-set (until a pre-set has been set and therefore is understood)
- Optional: Audible feedback to confirm the pre-set has been saved

### Hardware/technical references:

## 4.4 Example - I want to be able to easily set a station as a pre-set



When listening to the wanted station, press and hold the pre-set button. Once a pre-set has been set, it is preferred to show the station label



## **4.5 I want to keep listening to my station if it's available**



## 4.5 I want to keep listening to my station if it's available

### Consumer problems and research:

- Losing radio signal in the car can be frustrating for consumers.
- While any lack of DAB coverage should be addressed by broadcasters, the station may still be available on another DAB multiplex or on FM or IP

### Consumers want:

- The radio to find the best signal (FM, DAB or IP) to ensure they can continue listening to their station

### Consumer quotes:

*“To be honest, I just want my radio to find the best signal and stick with it!”*

## 4.5 I want to keep listening to my station if it's available

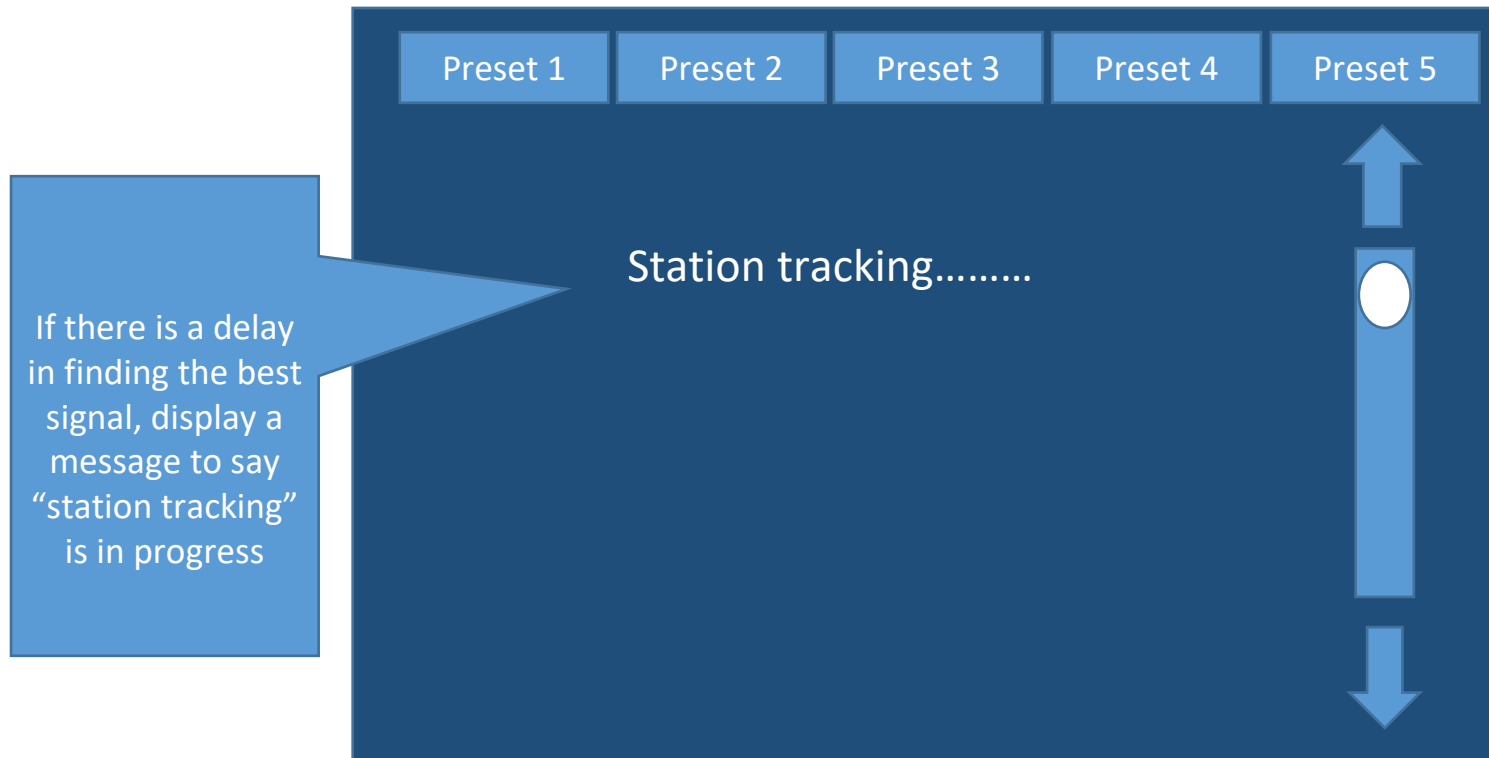
### Design guidelines:

- For FM/DAB tuners, the radio should search for the best signal on FM, DAB, DAB-DAB, for the station being listened to. This happens automatically.
- If there is a delay in finding a station, display a message to say that “station tracking” is in progress
- This function which is known technically as ‘Service Following/Linking’ is turned ON in the car by default. The driver is notified of ‘best signal search is on’ periodically so they understand if they don’t want it they need to turn it OFF
- For FM/DAB tuners with IP access, the radio should search for the best signal on FM, DAB, DAB-DAB, for the station being listened to. This happens automatically.

### Hardware and technical references:

- FM/DAB tuners - ETSI TS 103 176 [5]
- FM/DAB/IP – Radio DNS <https://radiodns.org/>

## 4.5 I want to keep listening to my station if it's available



## 4.6 I want to know more about what I'm listening to



## 4.6 I want to know more about what I'm listening to

### Consumer problems and research:

- Research shows that consumers value information such as station name, now playing, and potentially station logos\*.
- Broadcasters should be providing this information – both as text and as images to enhance the experience in the car. When this isn't available it can be a poor experience in the car
- When that data is made available by broadcasters, it is sometimes badly presented on the screen or very hard to find, which is frustrating for listeners and broadcasters

### Consumers want:

- Information about what they're listening (eg; station name, station logo, now playing, programme name, ensemble name) clearly presented on the screen

### Consumer quotes:

*“There were too many pieces of information on a large screen. Some of the information was good but felt cluttered”*

## 4.6 I want to know more about what I'm listening to

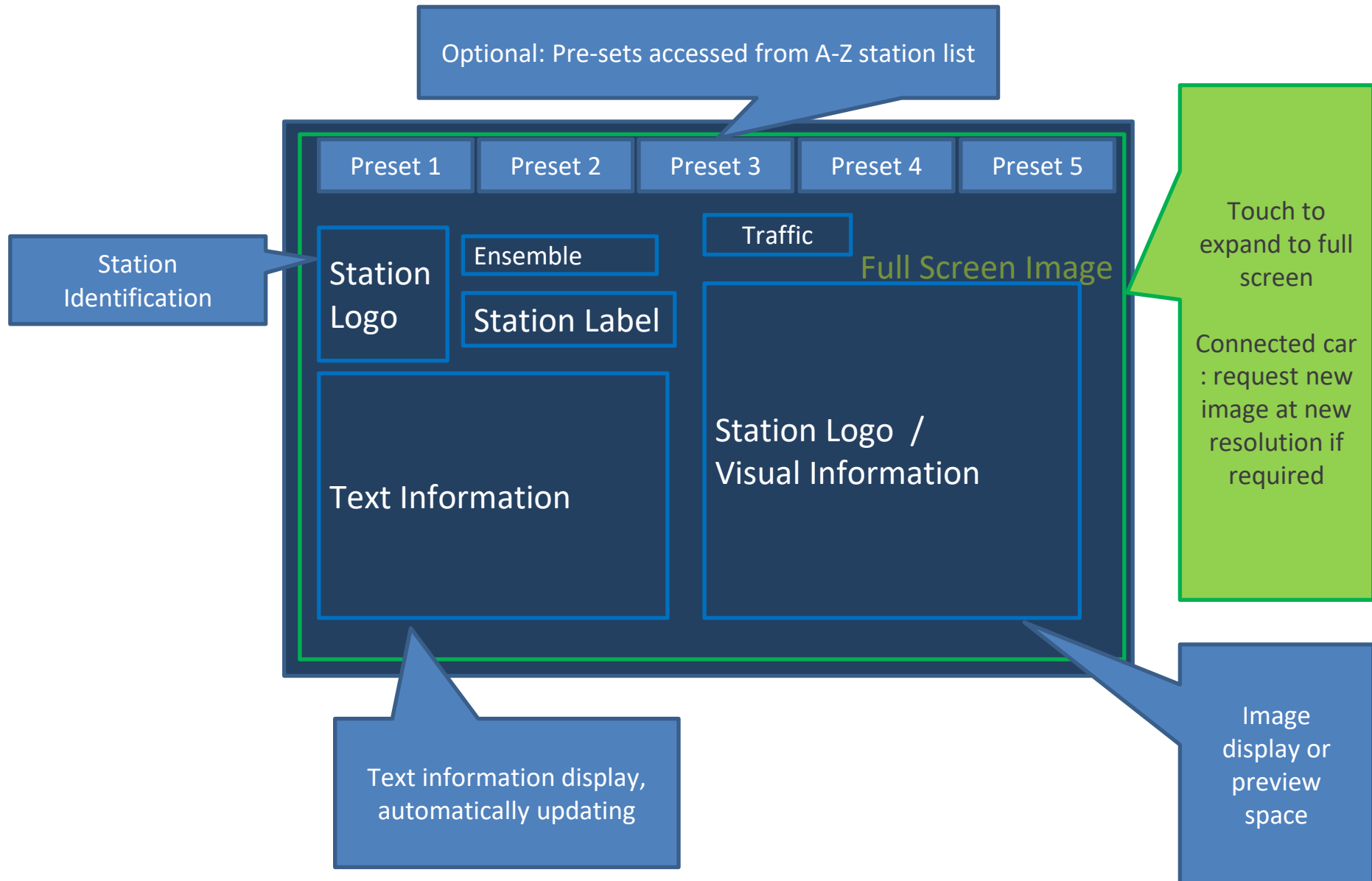
### Design guidelines:

- Single-line text display – provide a button which shows the latest text message, scrolling if necessary to fit onto the screen
- Multi-line text display – always show the latest text message without the driver having to press any buttons
- Colour screen display – always show the latest text message. Show the station logo until the first visual is received, then show it automatically.
- Connected car – Request images at native screen resolution, for best quality

### Hardware and technical references:

- DLS - ETSI EN300401
- Slideshow (Visuals) - ETSI TS101499
- Programme information and station logos – ETSI TS 102818
- Radio DNS / World DAB guidance paper - Provision of Station Logos to Automotive Receivers  
[https://www.worlddab.org/public\\_document/file/977/StationLogosDoc\\_FINAL.pdf?1517908972](https://www.worlddab.org/public_document/file/977/StationLogosDoc_FINAL.pdf?1517908972)

# 4.6 Example - Station Information





# 4.6 Example - Station Information

Display EPG when EPG and programme information is available. Once the EPG button is selected, goes to EPG view



Radio settings

# 4.7 I want my DAB radio to be set up automatically



## 4.7 I want my DAB radio to be set up automatically

### Consumer problems and research:

- When consumers buy a new car, they are typically briefed by the dealer on how to use the functions and controls in the car. Unless it is specifically asked for, this briefing will not always include the DAB radio functionality and settings.
- Consumers do not understand what different functionality settings will mean for the UX or which settings they should have ON by default

### Consumers want:

- Their default settings for the DAB radio to provide the best user experience

### Consumer quotes:

*“I didn’t really know where to start, especially when I couldn’t find a radio button”*

## 4.7 I want my DAB radio to be set up automatically

### Design guidelines:

- The following functions should all be on as default and form the basis of the factory re-set status of the car media system:
  - Service following
  - A-Z station list (default option to search)
  - Automatic station list updating
  - Default to DAB
  
- **Hardware and technical references:**

## 5. Future user experience work

### PHASE 2

- Further research to be carried out on user experience in the car including a larger research group
- Research into logos, icons and terminology for radio in the car

### PHASE 3

- Development of Hybrid FM/DAB/IP radio UX
- Impact of Voice technology on DAB UX

# Annexes

Radio UX  
In Car

# Annex - Glossary of Terms

## Text Message

DAB DLS, FM RT or RadioDNS /text.

## Manufacturers

Text Messages must always be automatically updated on the display as they are received. Commands to “REMOVE” messages must be respected. The receiver may “throttle” message change rate to XX every YY seconds.

## Broadcasters

Text Messages should describe accurately what is being broadcast now, or something directly relevant to the listener.

Text Messages should not be updated more than once every 30 seconds.

# Annex - Glossary of Terms

## Service Label

DAB Service Label, FM PS, or RadioDNS Name elements.

## Manufacturers

There is no requirement to update a Service Label whilst receiving a Service (e.g. “Scrolling PS”)

In markets where PS is unreliable, it can be discarded in favour of DAB Service Label or RadioDNS Name elements, if the service is correctly identified (e.g. DAB SId = RDS PI = RadioDNS bearer match)

Display the longest Service Label that can fit the available display space without scrolling

1. RadioDNS <longName> element
2. DAB Service Label (16 characters) or RadioDNS <mediumName> element
3. FM RDS PS (8 characters) or RadioDNS <shortName> element



# Annex - Glossary of Terms

## Station Logo

DAB EPG <mediaDescription> element

RadioDNS <mediaDescription> element

## Manufacturers

The Station Logo must be displayed at the highest resolution for the available display space.

The Station Logo with the closest available resolution must be selected for display, and scaled to fit, but the aspect ratio must not be changed

## Broadcasters

You must provide 5 versions of your logo on IP, and/or 4 versions over DAB SPI

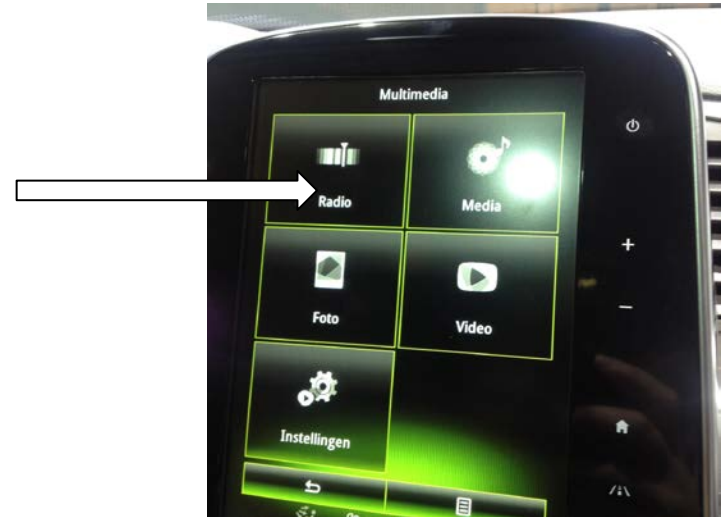
The Station Logo should be allowed to be cached for up to 30 days.

The Station Logo must not feature any transparency layers

# Annex UI In Cars – Examples – The Radio Button

- The radio button

Pictures of easy to navigate radio button



# Annex UI In Cars – Examples – Station Lists / Searches

- A-Z Station Lists / Search functions

Pictures of easy to use station lists / searches



Easy to read, navigate A-Z station list

## Annex UI In Cars – Examples – Pre-sets

- Pre-sets
- Pictures of easy to use pre-sets



## About WorldDAB

WorldDAB is the global industry association responsible for defining and promoting DAB digital radio. By bringing together radio industry professionals, WorldDAB provides knowledge and expertise that helps countries successfully adopt and implement broadcast digital radio.

Our 1200+ experts from over 100 member organisations cover 29 countries across the globe and include public and commercial broadcasters, regulators, network providers and manufacturers of receivers, chips, professional equipment and automobiles.

Together, we are shaping the future of radio, delivering advice and tailored solutions on all aspects of the switch from analogue to digital.

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