



Ford Motor Company

Subsystem Part Specific Specification

Engineering Specification



Research & Vehicle Technology
“Infotainment Systems Product Development”

**ANC Infotainment Subsystem Part Specific
Specification (SPSS)**

Version 1.4

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Version Date: October 7th, 2013

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Revision History

Date	Version	Notes	
February 25, 2010	1.0	Initial Release	
June 13, 2011	1.1	PWRMAN-GIF-190968-3-ANC Power Management Interface Requirements	sorris1: Added HMIAudioMode and Ignition_Status signals.
		PWRMAN-GREQ-190975-3-ANC Infotainment Power Moding	sorris1: Updated to reflect use of HMIAudioMode and Ignition_Status
		PWRMAN-GREQ-190969-2-ANC Power Moding Matrix	sorris1: Updated to reflect use of HMIAudioMode and Ignition_Status signals. Also removed Amp Enable Line information from table.
		PWRMAN-GREQ-40700-3-Bus wake-up transition times from Sleep Power Mode	jmyslin2: Updated requirement to reference CAN dB attribute values if applicable
		PWRMAN-GREQ-40701-3-Bus wake-up transition times from Unpowered Mode	jmyslin2: Updated requirement to reference CAN dB attribute values if applicable
		PWRMAN-GREQ-193463-1-ANC Status signal	Steve Orris: ANC requirement
		ALERTSYS-GREQ-40440-2-Default Chime Source at Start-Up	jmyslin2: Clarification to match rest of chime spec for Cluster
		ALERTSYS-GREQ-40441-4-Loss of communication with Chime module	jmyslin2: Update for AHU so it monitors the DSP AMP and ANC. Update for Cluster to only monitor the AHU signals.
		ALERTSYS-GREQ-40443-7-Chime Error States / Fault handling	jmyslin2: Updated for Cluster, AHU and DSP AMP setting _Chime_Supported signal at bus wake-up after AHU and DSP AMP chime diagnostics; AHU sets Chime supported for Cluster now
		ALERTSYS-GREQ-40444-2-_Chime_Supported signal changes to Supported from Not_Supported	jmyslin2: Update for Cluster to monitor only the AHU
		ALERTSYS-GREQ-193435-1-Response when chime signals from Chime Client set to inactive	jmyslin2: Updated for AHU to clarify requirement
		Appendix A: Definitions / Acronyms	ppatzel1: C1MCA section updated; TCM added;
August 11 th , 2011	1.2	PWRMAN-GFUN-270253-Load Shed Strategy	Jmyslin2: added function for load shed "PWRMAN-GFUN-270253-Load Shed Strategy"
January 28 th , 2013	1.3	STMGNT-GFEA-287120-Station Management - ANC	New Requirement
		STMGNTv2-GREQ-202160-4-Crank Audio Muting	sorris1: Updated to include use of Ignition_Status signal per DCR 11480802.
		STMGNTv2-GSD-202161-2-Crank, Front System ON	sorris1: Updated to include use of Ignition_Status signal per DCR 11480802.
		ALERT-GREQ-40354-4-Power-up time for infotainment components	<jmyslin2> Change to 2 seconds the time for infotainment chime components to be capable of producing chimes
		ALERT-GREQ-40441-5-Loss of communication with Chime module	jmyslin2: Added Audio Amp Module (AAM). If program supports AAM then AHU has to look for it since it is a chime components
		ALERT-GREQ-40443-9-Chime Error States / Fault handling	jmyslin2: Updates to AHU, DSP AMP, AAM and ANC to match IDS Chime Diagnostics
		ERRMGNT-GREQ-149906-3-Infotainment Update Bit handling	jmyslin2: updated for in Run since on CGEA 1.3 vehicles other non-infotainment buses may be asleep when infotainment bus awake (so update bit not fresh data but not missing message). Also IDS only does missing messages in Run and all buses active in Run
		Appendix A: Definitions / Acronyms	hzubert: PATS added; removed double definition of RDS
October 7 th , 2013	1.4	PWRMAN-GFUN-190966-2-ANC PowerModing	Mwarsit: add requirement "FAS-ANC-GREQ-303766-1-C1MCA Chime Generator and Chime Audio Source Power Moding (Functional)" for deployment with C1MCA chime interface



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		PWRMAN-GREQ-190969-4-ANC Power Moding Matrix	mwarsit1: Insert row to cover utilization of ANC module with C1MCA chimes.
		PWRMAN-GREQ-303766-2-C1MCA Chime Power Moding	mwarsit1: Change wording based on review feedback to add C1MCA Chime Power Moding. Add reference to status of Power_Up_Chime_Module, Mutlimedia_System, HMIAudioMode and Ignition_Status.
		STMGNTv2-GREQ-202160-5-Crank Audio Muting	sorris1: Requirement wording has been updated to clarify that both the PwPckTq_D_Stat and Ignition_Status must be monitored, and either signal will cause the audio mute.



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1 PWRMAN-GFEA-40449-2-ANC Power Management

1.1 PWRMAN-GFUN-190966-2-ANC PowerModing

Descriptions:

Functional: ANC fully operational supporting Audio. Can be with or without network activity

Standby: ANC not supporting active noise cancellation functions but is supporting network activity (low power state)

Sleep: ANC module powered down with no network activity

1.1.1 ANC Interface Requirements

1.1.1.1 PWRMAN-GIF-190968-3-ANC Power Management Interface Requirements

Method	Notes	Parameters
Multimedia_System	Signal indicating if the infotainment system is ON or OFF.	0x0 OFF 0x1 ON
ActvNse_B_Actv	The ANC module (Active Noise Cancellation Module) transmits signal ActvNse_B_Actv = ON when it is producing a cancellation or enhancement signal and its output is active. When the ANC Module is not transmitting a cancellation or enhancement signal or its output is switched off, ActvNse_B_Actv = OFF	0x0 Inactive 0x1 Active
HMIAudioMode.St()	Signal sent by the System Master to the Infotainment modules to indicate the power mode status of the infotainment system.	0x0 Inactive 0x1 OFF 0x2 ON 0x3 Reserved (N/A Global Infotainment) 0x4 Reserved (N/A Global Infotainment) 0x5 Load Shed Active
Ignition_Status	Signal indicating the status of the ignition switch mode.	\$0: Unknown \$1: Off \$2: Accessory \$4: Run \$8: Start \$F: Invalid

Note: See Chime section for ANC signal for chimes not being supported

1.1.2 Requirements

PWRMAN-GREQ-190970-1-ANC Chime Heartbeat (System) -

The ANC module (Active Noise Cancellation Module) will be fully operational and shall vote to keep the bus awake so it can periodically transmit its heartbeat CAN signal which includes the Chimes_Supported signal whenever it receives Power_Up_Chime_Modules = Active. It shall only request sleep when Power_Up_Chime_Modules = Inactive.

Note: If Power_Up_Chime_Modules signal is not in the CAN database, do not log a missing message.

PWRMAN-GREQ-190975-3-ANC Infotainment Power Moding (System) -

The ANC module will be fully operational when it receives Multimedia_System == ON, HMIAudioMode == ON, or Ignition_Status > Accessory.

If the bus goes to sleep and the last state received was Multimedia_System == ON then the ANC module shall start a 65 minute timer and remain fully powered up supporting ANC functions. After 65 minutes without receiving the Multimedia_System signal the ANC module shall go to sleep. Anytime the ANC module receives Multimedia_System == ON it shall reset its timer. If at any time the bus wakes back up and the ANC receives Multimedia_System == OFF then the timer shall end and the ANC module goes to Standby and requests sleep.

PWRMAN-GREQ-190969-4-ANC Power Moding Matrix (System) -

"Power_Up_Chime_Module" signal state ¹	"Multimedia_System" signal state ¹	"HMIAudioMode" signal state ¹	"Ignition_Status" > Accessory ¹	ANC Network Management	ANC Power Mode	Comments
Active	ON or OFF	ON or OFF	True or False	Request Network stay Active	Functional Power Mode	Network to remain active so can send the chime heartbeat signal to the Cluster
Inactive	ON or OFF ²	ON or OFF ²	True or False ²	Request Network to go to Sleep	Functional Power Mode	In this state can remain in functional power mode without needing the bus to stay active
Inactive	OFF	OFF	False	Request Network to go to Sleep	Functional Power Mode while network awake	This row applicable only when configured for C1MCA Chimes
Inactive	OFF	OFF	False	Request Network to go to Sleep	Sleep or Standby	Low power state

Notes:

- 1) Power_Up_Chime_Module, HMIAudioMode, Mulitmedia_System or Ignition_Status signals may not be on the same bus as the ANC module for a certain program and in that case consider the missing signal in the OFF/Inactive/False state for the table above.
- 2) At least one of the following conditions must be true, to be in functional power mode while requesting to go to sleep:
 - HMIAudioMode=ON
 - Mulitmedia_System=ON
 - Ignition Status > ACC
 - Configured for C1MCA Chimes

PWRMAN-GREQ-40700-3-Bus wake-up transition times from Sleep Power Mode (System) -

Upon bus awake from sleep mode infotainment modules shall transition to Ready to Receive (T1) within 100 msec.

Upon bus awake from sleep mode infotainment modules shall transition to Ready to Transmit (T2) within 150 msec. The infotainment modules shall not Transmit active signal value information to support an infotainment feature before 150 msec has elapsed from bus awake (unless noted otherwise).

Note: T1 and T2 are FNOS CAN dB attributes "NodeStartUpTime", "NodeWakeUpTime" and "GenMsgStartDelayTime". When the attribute NodeWakeUpTime is greater than 0 in the CAN dB then use the CAN dB attributes mentioned above for T1 and T2 otherwise use the SPSS values.

PWRMAN-GREQ-40701-3-Bus wake-up transition times from Unpowered Mode (System) -

Upon bus awake from Unpowered mode modules shall transition to Ready to Receive (T1) within 950 msec.

Upon bus awake from Unpowered mode modules shall transition to Ready to Transmit (T2) within 1000 msec.

Note: T1 and T2 are FNOS CAN dB attributes "NodeStartUpTime", "NodeWakeUpTime" and "GenMsgStartDelayTime". When the attribute NoteWakeUpTime is greater than 0 in the CAN dB then use the CAN dB attributes mentioned above for T1 and T2 otherwise use the SPSS values.

PWRMAN-GREQ-193463-2-ANC Status signal (System) -

The ANC module (Active Noise Cancellation) shall transmit ActvNse_B_Actv = ON when it is producing a cancellation or enhancement signal and its output is active. When the ANC module is not transmitting a cancellation or enhancement signal or its output is switched off then ActvNse_B_Actv = OFF.

PWRMAN-GREQ-303766-2-C1MCA Chime Power Moding (Functional) -

When the ANC module is configured for C1MCA chimes then the ANC module shall be in functional power mode able to support audio whenever the network bus is active. When the ANC module is not configured for C1MCA chimes then C1MCA Chime Power Moding does not apply.

When Power Up Chime Module = OFF, Mutlimedia System = OFF, HMIAudioMode = OFF and Ignition Status < Accessory for C1MCA Chime Power Moding the ANC module shall not request the network bus stay active but shall be fully powered up in Functional Power Mode as long as the bus is active.

C1MCA chimes is independent of CGEA chimes which is defined in 'Alert-GFEA-193452-Alerts-Chimes'. The CGEA chime requirements don't apply to C1MCA chimes.



1.2 PWRMAN-GFUN-270253-1-ANC Load Shed Strategy

Note: When the ANC module is not on the info-CAN bus there is no load shed signal. Instead the ANC module will receive Multimedia_System = OFF when HMIAudioMode = Load Shed.

PWRMAN-GREQ-66172-2-Infotainment Components Load Shed State requirements (System) -

Unless otherwise noted the infotainment components shall transition to their Standby or Sleep Load Shed low power state when the signal HMIAudioMode == Load Shed.

The infotainment components that support chimes (ex. AHU, DSP AMP, AAM, ANC...) shall wait until the Cluster transfers control of the chimes back to the Cluster (as defined in [ALERTSYS-GREQ-40447-2-ALERTSYS-GREQ-40447-2-](#)) before entering their low power states.

In the Standby Load Shed low power state non-essential component functions shall be turned OFF (ex. active pre-fetch). Basic standby operations will still be followed such as supporting the Network bus and any regulatory requirements (ex. illumination).

Note: There may also be applicable Climate Control load shed requirements for modules the support Climate Control functionality.

PWRMAN-GREQ-40682-2-Infotainment Components transition from Load Shed State to Normal Operation (System) -

For the System Master if a Load Shed event is ended after previously being active in the same ignition cycle then the infotainment system can return to its previous audio source in functional power mode. This only applies if PowerMode > KeyOut (ie so audio doesn't come back up in Extended Play).

The infotainment components shall become operable again if the signal HMIAudioMode changes from 'Load Shed' to 'ON' (functional) or 'OFF' (standby functions).

2 STMGNT-GFEA-287120-Station Management - ANC

2.1 Vehicle Crank Mute Functions

The "STMGNT-GFUN-121306-1-Crank, Front System ON" function is used for CGEA 1.2 and C1MCA architectures.

The "STMGNTv2-GFUN-202153-1-Crank, Front System ON" function is used for the CGEA 1.3 architecture and beyond.

2.1.1 STMGNT-GFUN-121306-1-Crank, Front System ON

2.1.1.1 Requirements

STMGNT-GREQ-121422-4-Crank Audio Muting (System) -

The AHU, AAM (if present) or DSP-AMP (if present) shall mute the audio for a Crank event unless noted otherwise.

If a crank hardwire is present then the AHU shall mute/unmute off of the hardwire and mute the DSP AMP / AAM (if present) via the AMP enable/disable hardwire.

The AHU, AAM and DSP-AMP shall mute/unmute off of the Crank network signal. The Audio shall be muted within 30 msec of the Audio Volume Control module (AHU / AAM / DSP AMP) receiving the signal PowerMode == Crank.

The AHU / AAM / DSP AMP shall support both the hardwire muting and crank muting network signal and shall mute on whatever happens first. The AHU / AAM / DSP AMP shall unmute once both the hardwire (if present) and Crank network signal are inactive. Once an unmute event occurs the AHU/AAM/DSP AMP shall unmute within 1000 msec.

Reference the AHU, AAM and DSP-AMP specification / component requirements for additional crank / low voltage muting requirements.



2.1.1.2 Sequence Diagrams

STMGNT-GSD-121298-1-Crank, Front System ON

Linked Elements

Pre-condition

Infotainment System ON in Functional Power Mode

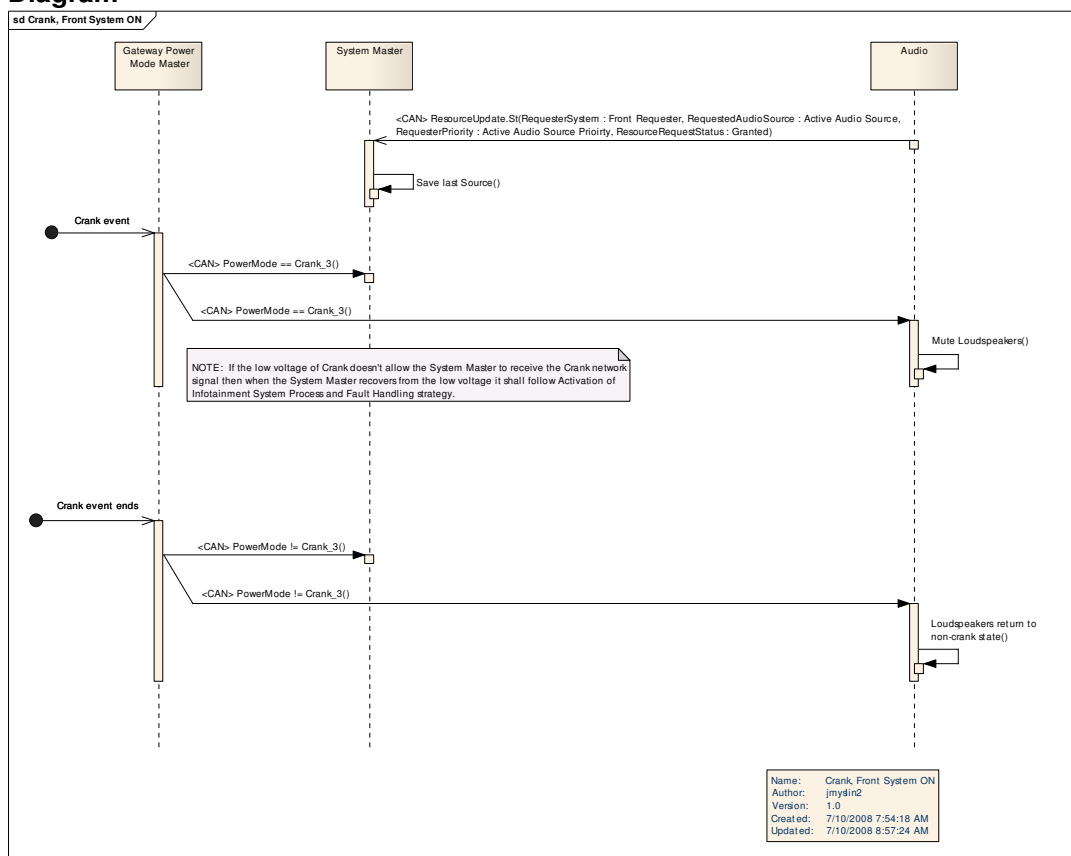
Scenario

Crank event occurs

Post-condition

Infotainment System recovers following the crank event

Sequence Diagram



2.1.2 STMGNTv2-GFUN-202153-1-Crank, Front System ON

2.1.2.1 Requirements

STMGNTv2-GREQ-202160-5-Crank Audio Muting (System) -

The AHU, AAM or DSP-AMP (if present) shall mute the audio for a Crank event unless noted otherwise.

Two methods can be used to provide indication to the audio system to mute during a crank event:

Method 1: Dedicated "start/crank" hardwired input combined with the Eng_D_Stat network signal.

Or



Method 2: Standalone network signals, monitoring both PwPckTq_D_Stat and Ignition_Status, to determine if the engine is in a cranking state.

Both methods may be utilized on a vehicle platform; therefore the mute shall occur on whichever method occurs first.

For method 1, the AHU shall mute on the assertion of the hardwired input and Eng_D_Stat != EngAutoStopped. If present, the AHU shall also mute the AAM / DSP AMP via the AMP enable/disable hardware.

For method 2, the AHU, AAM and DSP-AMP (if present) shall monitor both the PwPckTq_D_Stat and Ignition_Status network signals to perform audio muting based upon a "start" condition. Upon the AHU, AAM and DSP AMP (if present) receiving the first indication of start occurring, (either via "PwPckTq_D_Stat == Strt In Prg No Tq" or "Ignition_Status == Start"), the audio shall be muted within 30 msec.

The AHU shall unmute once the hardwire "start/crank" input (if present), and both the PwPckTq_D_Stat and Ignition_Status network signals are no longer triggering the audio mute. The AAM / DSP AMP shall unmute once the AMP enable/disable hardware, and both the PwPckTq_D_Stat and Ignition_Status network signals are no longer triggering the audio mute. Once an unmute event occurs the AHU/AAM/DSP AMP shall unmute within 1000 msec.

Reference the AHU, AAM and DSP-AMP specification / component requirements for additional crank / low voltage muting requirements.

STMGNT-GREQ-198168-2-Warm-Crank for Modules Not Regulated (Functional) -

On Start-Stop vehicles any module with voltage not regulated by the VQM (Voltage Quality Monitor) shall function normally during warm crank events (re-start after stop event).

When the VQM is not present on Start-Stop vehicles the infotainment modules shall function normally during warm crank events. Warm cranks are defined in Power Supply "Global Power Supply Start/Stop Voltage Curve Specification – FS-0000-000001-A". Power Supply RQT "RQT-002600-000443" references specification FS-0000-000001-A.

2.1.2.2 Sequence Diagrams

STMGNTv2-GSD-202161-2-Crank, Front System ON

Linked Elements

Pre-condition

Infotainment System ON in Functional Power Mode

Scenario

Crank event occurs

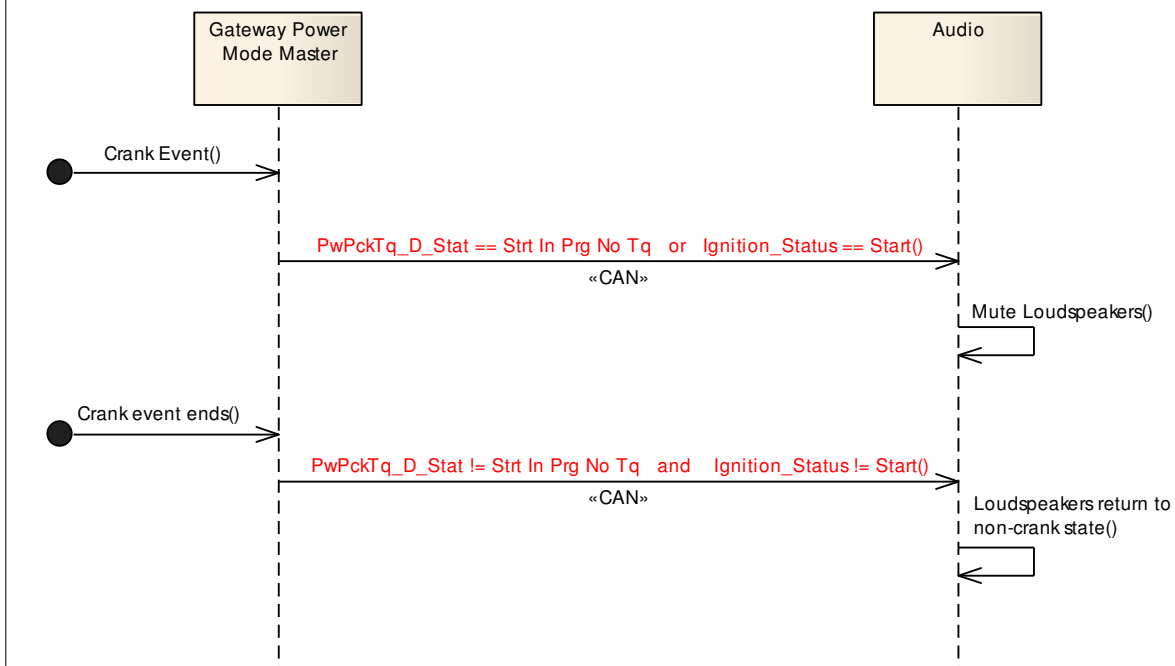
Post-condition

Infotainment System recovers following the crank event



Sequence Diagram

sd Crank, Front System ON



Name: Crank, Front System ON
Author: sorris1
Version: 1.0
Created: 1/13/2010 8:20:55 AM
Updated: 9/26/2012 9:24:38 AM



3 Alert-GFEA-193452-1-Alerts - Chimes

Note: "Alerts – CGEA Chimes" section is only applicable when ANC is configured to receive Power_Up_Chimes_Modules signal.

The Cluster is the Chime Client/Master responsible for command and control of what chimes the infotainment system chime components will generate.

3.1 Alert Interface Requirements

3.1.1 ALERTSYS-GIF-193856-1-Alert Method Descriptions

Method	Notes	Parameters
<CAN-Message> IPC_Infotainment	Event-Periodic message from the Chime Client to the Infotainment System	Chime_Source (Signal) 0x0 Invalid 0x1 Infotainment_System 0x2 Cluster Attn_Info_Audio (Signal) – Attenuates the Infotainment Audio 0x0 No Attenuation of Audio 0x1 Attenuation_1 0x2 Attenuation_2 cont. 0x6 Attenuation_6 (higher attenuation number indicates a greater increase in audio attenuation) 0x7 Unknown New_Attn_Event (Signal) 0x0 Inactive 0x1 Active Power_Up_Chime_Modules (Signal) 0x0 Inactive 0x1 Active
<CAN> ANC_Chimes_Supported	Method from the ANC indicating to the Chime Master (ie Cluster) if chimes are supported by the ANC	0x0 Inactive 0x1 Supported 0x2 Not_Supported



3.2 Alert-GFUN-193858-1-Chimes

ALERT-GREQ-40349-4-Alert Configuration Table (System) -

The Alert Generator and Alert Audio Source will vary depending on the infotainment system module availability. The Infotainment System Alert set-up will follow the table below.

Modules Present	Chime Client (Chime Master)	Beep Generator	Prompt Generator	Chime Generator	Alert Audio Source (Module to Play & Mix Audio)
AHU / SYNC / DSP AMP	Cluster	DSP AMP	SYNC	AHU	DSP AMP
SYNC / AHU	Cluster	AHU	SYNC	AHU	AHU
AHU / DSP AMP	Cluster	DSP AMP	N/A	AHU	DSP AMP
AHU	Cluster	AHU	N/A	AHU	AHU

Alert Configuration Table

3.2.1 Chime Activation Requirements

ALERT-GREQ-40354-4-Power-up time for infotainment components (System) -

The infotainment chime components shall be capable of producing chime audio within 2.0 seconds of 'Power_Up_Chime_Modules = Active'.

ALERT-GREQ-198071-2-ANC Network Activation (System) -

The ANC module shall vote to keep the network bus awake as long as Power_Up_Chimes_Modules = Active.

Note: this is so the ANC module can send its heartbeat signal to the Chime Generator

3.2.2 Chimes Error Management Requirements

Note: During Crank audible chimes may not be supported by the Infotainment System

ALERT-GREQ-40440-2-Default Chime Source at Start-Up (System) -

Upon bus wake-up the default is for the Cluster to set the Infotainment System as the Chime Generator & Chime Audio Source via the 'IPC_Infotainment.St() : Chime_Source = Infotainment_System' signal unless an Error state had been entered previously. This is assuming the Cluster was configured to have the Infotainment System as the Chime Source.

ALERT-GREQ-40441-5-Loss of communication with Chime module (System) -

The Cluster shall monitor the AHU_Alert heartbeat periodic message for determining if the Chime Generator fell off the bus. If the Cluster loses communication with the Chime Generators AHU_Alert message for more than 5 seconds then the Cluster shall become the Chime Generator and Chime Audio Source and shall set the signal 'IPC_Infotainment.St() : Chime_Source = Cluster' and 'Power_Up_Chime_Modules = Inactive'.

If Chimes are supported through the infotainment system then the Chime Generator has to determine if a vehicle has the DSP AMP, AAM or ANC module present on a vehicle. If the Chime Generator loses communication with the DSP AMP, AMM or ANC module for more than 5 seconds then the Chime Generator shall set AHU_Chime_Supported = Not Supported so the Cluster becomes the Chime Generator and Chime Audio Source.

**ALERT-GREQ-40443-11-Chime Error States / Fault handling (System) -**

If the Chime Generator sets its signal 'XXX_Chimes_Supported' equal to 'Not_Supported' for a particular configuration then the Cluster shall become the Chime Generator and Chime Audio Source and sets the 'IPC_Infotainment.St() : Chime_Source = Cluster' and Power_Up_Chime_Modules = Inactive.

The Chime Generator shall monitor the Infotainment System Chime components (ie ANC, AAM, DSP AMP) XXX_Chimes_Supported signals. If the ANC, AAM or DSP AMP XXX_Chimes_Supported signals equal Not_Supported then the AHU shall set its AHU_Chimes_Supported signal = Not Supported. Note: The AHU shall not monitor the ANC Chime Supported signal when ANC is integrated in the AHU or when a DSP AMP module is present.

The Chime components are responsible for setting "_Chimes_Supported = Not_Supported" whenever they are no longer able to produce chimes because of a fault condition, otherwise their signal shall be set to 'Supported'. A normal crank event is not considered a fault condition. A normal crank event would not cause the Chime Supported signal to change. For example if Chime_Supported = Supported and a normal crank event occurs the Chime Supported value would remain equal to Supported and would not change because of the crank event (ie would never change to Inactive or Not_Supported). A chime FMEA shall be performed on all the chime components to verify that fault conditions are detected and _Chimes_Supported is set to Not_Supported when necessary.

Any infotainment component that could prevent chimes from being played through the infotainment system needs to have a "XXX_Chimes_Supported" signal so chimes can be transferred to the Cluster for an error condition.

Some fault conditions (while not limited to these) that would result in the _Chimes_Supported signal being set to Not_Supported: 1) Short/open circuit to any of the chime speakers 2) short/open circuit on the line level signals to the chime components 3) low voltage preventing the chime components from producing audio...

When the Audio Enable line is keeping the Audio Muted for more then 5 seconds then the chime source being muted shall set its chime signal 'XXX_Chime_Supported' equal to 'Not_Supported' (example DSP AMP, ANC, AAM).

The Chime Audio Components (ex.AHU, DSP AMP, AAM, ANC...) shall set their _Chime_Supported signal to Supported or Not_Supported within 2000 msec of the start of Chime Diagnostics. Reference the IDS for entering chime diagnostics.

If the Chime Generator doesn't receive the ANC, AAM or DSP AMP Chimes_Supported signal equal to Supported within 3000 msec after the start of chime diagnostics it shall treat 'Inactive' the same as 'Not_Supported' and set AHU_Chimes_Supported = Not_Supported. During the 3000 msec since chime diagnostics started if the ANC, AAM or DSP AMP has their chime supported signal set to "Inactive" then the Chime Generator shall also have its _Chime_Supported signal set as "Inactive".

If the Chime Client (Cluster) receives 'AHU_Chimes_Supported = Inactive' 5000 msec after Power_Up_Chime_Modules transitions from Inactive to Active then it shall treat 'Inactive' the same as 'Not_Supported'.

Note: The IPC_Infotainment : Chime_Source signal has no effect on the _Chime_Supported signal.

The user adjusted Bass, Treble, Balance, Mid-Range, Fade settings shall not effect chimes. For example if the BTMBF setting did effect chimes the user could fade to front speakers and a chime that is supposed to be played out of the rear speakers only would not be heard.

ALERT-GREQ-40444-2- Chime Supported signal changes to Supported from Not Supported (System) -

If the Chime Generator set its signal 'XXX_Chimes_Supported' equal to 'Supported' after previously being set to 'Not_Supported' in the same ignition state then the Cluster shall not set the infotainment system as the chime source until the next ignition cycle. The 'IPC_Infotainment.St() : Chime_Source' shall remain equal to 'Cluster' for that ignition state.

ALERT-GREQ-40447-3-Load Shed (System) -

During an infotainment Load Shed event (HMIAudioMode = Load Shed) the Cluster shall set the 'IPC_Infotainment.St() : Chime_Source' signal equal to 'Cluster' AND Power_Up_Chimes_Modules = Inactive for that ignition cycle and the Cluster shall become the Chime Generator and Chime Audio Source.

Note: see PWRMAN-GREQ-66172-2-Infotainment Components Load Shed State requirements for when an infotainment load shed event is active

**ALERT-GREQ-193435-1-Response when chime signals from Chime Client set to inactive (System) -**

If any of the signals Chime, Chime_Directionality, Chime_Time_Criticality, OFF_Time_Btwn_Chime, or Chime_Occurance in the IPC_Chime (1 or 2) messages are set to 'inactive' then the Chime Generator won't create a new chime sound and the AHU_Alert : AHU_Chime_Active signal will be set to No_Chime to tell the Cluster that it is not playing the chime.

4 FAS-ANC-GFEA-265681-1-Active Noise Cancellation

4.1 General Requirements

FAS-ANC-GREQ-265499-1-ANC Specific Update Bit handling (Functional) -

For the following signals, the associated Update Bit signal shall only be considered "Unknown" when ignition status is equal to Run. When not in Run the signals are not used and the update bit status is considered, "don't care".

Signal(s):

0x38A Body_Info_1_HS3 : CcdMsgTxt_D_RqDsply_UB

Note: Update bit "Unknown" state is defined in requirement, ERRMGNT-GREQ-149906-2-Infotainment Update Bit handling

5 ERRMGNT-GFEA-265228-1-Error Management - ANC

5.1 ERRMGNT-GFUN-265225-1-Fault Handling - ANC

5.1.1 Requirements

ERRMGNT-GREQ-149906-3-Infotainment Update Bit handling (System) -

Signals received from the gateway module may have a corresponding update bit with the signal.

The update bit indicates if the signal data is fresh or not fresh. If the UB signal indicates "fresh data" the signal shall be acted upon. If the UB signal is "not fresh" the corresponding signal shall be considered the same as last state received when the UB indicated "fresh" data.

Unless noted otherwise if the receiving module does not receive an update bit indicating fresh data for more than 5 consecutive seconds while Ignition Status = Run then the signal value can be considered unknown/missing and the receiving module may take appropriate fault handling actions if necessary.

Note: Climate Control strategy for handling update bits is covered in the applicable Climate Control specifications/requirements.

6 MMCAN-GFEA-191064-1-Info-CAN Network

IFS-MMCAN-GREQ-66249-1-Inactive (Functional) -

For Request and Response signals, the value <0x0 – Inactive> is always added in the CAN message list. These values are not shown in the object specifications since they have no relevance for the application and will never consider signals which have this value.

The reason for adding the inactive state is that since signals are packed together in one message (8 byte) the receiver could interpret the signal as a new request if the signal has not been reset to Inactive (0x0).

7 Appendix A: Definitions / Acronyms



AA – Audible Alert
AAM – Audio Amp Module
ACC – Accessory
ACU – Audio Control Unit
AF - Alternative Frequency - This allows a receiver to re-tune to a different frequency providing the same station when the first signal becomes too weak (e.g. when moving out of range)
AHU – Audio Head Unit = IAM
AM - Amplitude Modulation - AM radio band
AM autotset - AM Autotset preset bank
APA – Asia Pacific & Africa
APIM – Auxiliary Protocol Interface Module (ie SYNC module)
BCM – Body Control Module
BCP – Button Control Panel
BVC – Bluetooth Voice Control (legacy-FoE)
C1MCA – C1 Platform Mid-Cycle Action (current global C-Car Platform e.g. C346, C520 etc)
CAN – Controller Area Network
CC – Climate Control
CD – Compact Disc
CES – Command Execution Status
CGEA – Common Global Electrical Architecture (note: has CGEA electrical body architecture – ex. U38X)
CPPM – Cell Phone Passport Module
CT - Central Time
DAB - Digital Audio Broadcast
DSCM – Dual Climate Seat Module
Del ACC – Delayed Accessory
DLC – Data Link Connector (SAE J1962)
DSP Amp – Digital Signal Processor external amplifier module
Dual EATC – Dual Electronic Air Temperature Control
Dual Play -- The RSE Audio Source is ON (ie an Audio Source is granted in the rear audio stack)
DVD - Digital Video Disc
EBU - European Broadcasting Union - Similar to the National Radio Systems Committee (NRSC)
ECC - Enhanced Country Code
ECU – Electronic Control Unit
ECP – Electronic Control Panel (Infotainment EFP + Climate module in one)
EFP – Electronic Finish Panel (CAN Button Panel)
ES – Engineering Specification
EON - Enhanced Other Network
FAS – Functional Area Specification
FCDIM – Front Control Display Interface Module (Info-CAN name for the MFD)
FCIM – Front Control Interface Module (CAN dB name for the EFP and ICP)
FES – Family Entertainment System (Rear seat DVD)
FM - Frequency Modulation - FM radio band
FM autotset - FM Autotset preset bank
FNA – Ford North America
FNOS – Ford Network Operating System
FoE – Ford of Europe
FSE – Front Seat Entertainment
GPMS – GPS Module
HD - High Definition Radio - High Definition Radio
HEC – Hybrid Electronic Cluster
HMI – Human Machine Interface
HSWM – Heated Steering Wheel Module
IAM – Integrated Audio Module = AHU
ICP – Instrument Control Panel (LIN Button Panel)
IHS – Infotainment System HS-CAN Network
IKD – Ignition Key Device
Info-CAN – Infotainment System HS-CAN Network
IPC – Instrument Panel Cluster
LIN – Local Interconnect Network
Manual EATC – Manual Electronic Air Temperature Control
MBP – Multiple Button Press
MC – Message Center
MFD – Multifunction Display
MM Active – Multimedia Active
MM Inactive – Multimedia Inactive
MM System – Multimedia System
MS-CAN – Medium Speed CAN
OHCM – Overhead Console Module
OME – Operation Mode Event
PAM – Park Aid Module
PATS – Passive Anti Theft System



PHS – Powertrain HS-CAN Network
PI - Program Identification - This is the unique code that identifies the station. Every station receives a specific code with a country prefix
PS - Program Service Name - This is an eight-character static display that represents the call letters or station identification name
PTT – Push To Talk
PTY - Programme Type
PTY31 - Emergency (PTY31) - Alarm Message causes volume to be set to preset level
RBAP – Receiver Button Activation Process
RBDS - Radio Broadcast Data System
RCCM – Remote Climate Control Module
RDS – Radio Data System
RPA – Reverse Park Aid
RSE – Rear Seat Entertainment
RACM – Rear Audio Control Module (same as RSEM)
RSEM – Rear Seat Entertainment Module
RT - Radio Text
SCM – Steering Control Module (same as module SCCM)
SCCM – Steering Column Control Module (Steering wheel controls)
SDARS – Satellite Digital Audio Receiver System
Single Play -- The FSE Audio Source shall have control of the entire audio system (ie no audio source granted in rear audio stack)
SPDJB – Smart Power Distribution Junction Box
SPSS – Subsystem Part Specific Specification
SWC – Steering Wheel Control
SWCM – Steering Wheel Control Module
SWAC – Steering Wheel Audio Control
SWLT – Steering Wheel Left Toggle
SWRT – Steering Wheel Right Toggle
TA - Traffic Announcement
TBAP – Transmitter Button Activation Process
TCM – Traction Control Module
TCU – Telematics Control Unit
TMC - Traffic Message Channel
TP - Traffic Program
TTS – Text to Speech
VR – Voice Recognition
VRM – Voice Recognition Module