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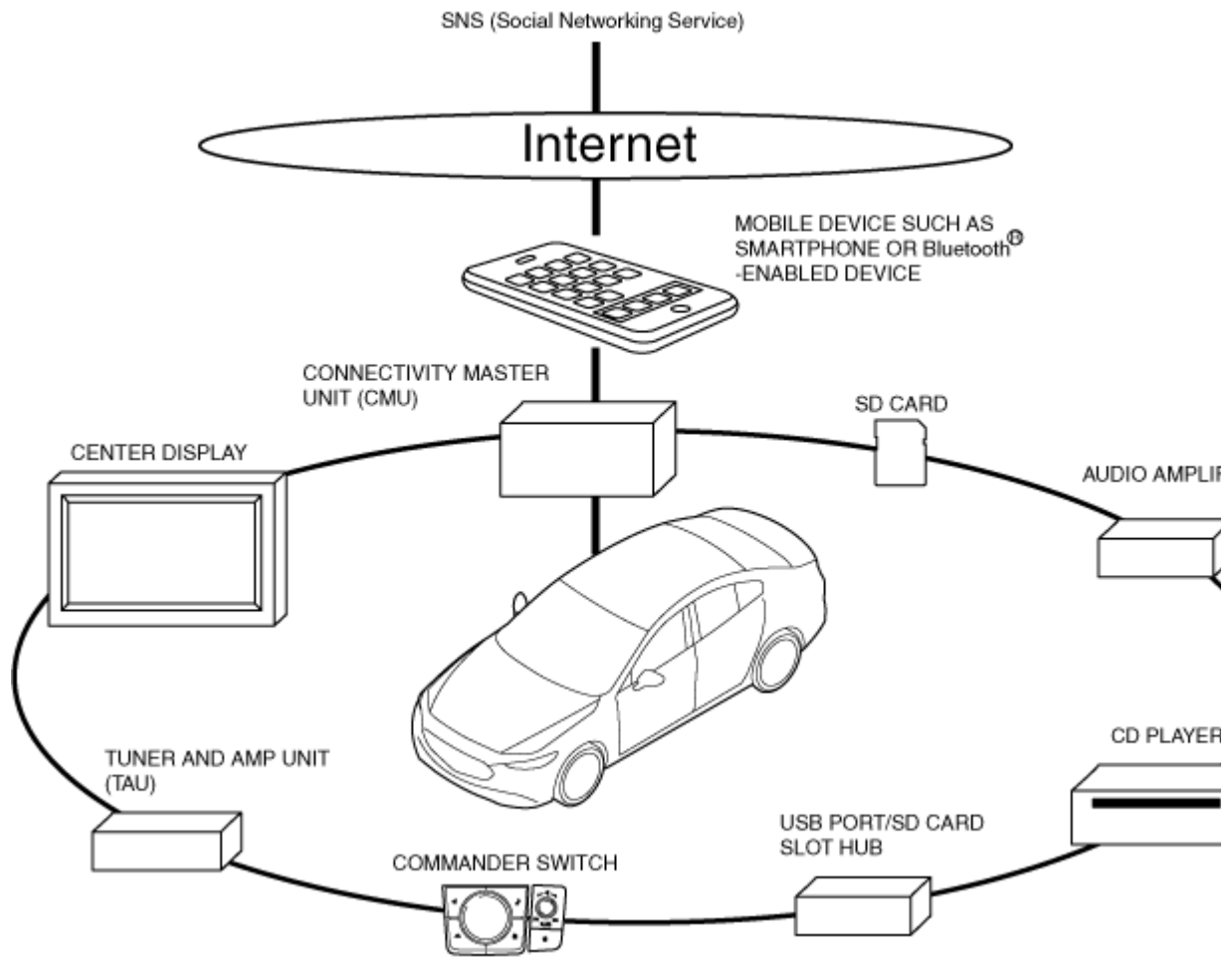
Note

- iPod, iPhone, and Apple CarPlay are registered trademarks of Apple Inc.
- Android, and Android Auto are registered trademarks of Google LLC.

Outline

- In addition to the conventional audio and navigation functions, communication tools such as Internet radio, SMS (Short Message Service), SNS (Social Networking Service), and Bluetooth® functions can be operated as one function of the vehicle by connecting a mobile device such as a customer's Smartphone or tablet terminal.

Schematic Diagram



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Reference List Table

Item	Content/function	Reference
Operation signal reception	The entertainment system receives operation signals sent from the center display, commander switch, or the voice recognition function to operate each function.	Operation (See Operation signal reception.)
Audio function	<ul style="list-style-type: none"> • Music media listening such as radio, CD and iPod is available. • Video media playing such as USB media is available. 	Function (See Audio function.) Operation (See Audio function.)
Communication function	SMS (Short Message Service), SNS (Social Networking Service), and Bluetooth [®] Hands-free functions are available.	Function (See Communication function.) Operation (See Communication function.)
Navigation function	Provides guidance and information to destination.	Function (See Navigation function.) Operation (See Navigation function.)
Setting function	Changes the vehicle settings such as for the center display screen, sound quality/volume.	Function (See Setting function.) Operation (See Setting function.)

Application function	The fuel efficiency monitor, vehicle status monitor, owner's manual and warning guidance information can be verified.	Function (See Application function.) Operation (See Application function.)
Structural diagram	—	(See Structural View.)
System diagram	—	(See Operation.)

Function

Audio function

AM/FM radio

- AM and FM radio broadcast can be listened to.
- A condenser has been adopted for noise reduction.

RDS (radio data system)

- The RDS can be listened to. The RDS displays the name of the radio station being tuned and track information (such as track name and artist name) being played by the radio station in the center display. In addition, the RDS provides the following two types of traffic information services.

Traffic information voice

- If traffic information broadcast begins while the RDS is being listened to, it automatically switches to the traffic information voice.

Traffic information data (RDS-TCM)

- Traffic information, such as the location and length of traffic jams, is displayed above the navigation screen in the center display.

Note

- Music information or album art may not be displayed in the center display depending on the radio reception status.

DAB radio (Digital Audio Broadcasting) (With DAB radio)

- DAB radio broadcasts can be listened to.
- When Radio Text in the DAB setting is turned on, music information (song name/artist name) is displayed in the center display.

Note

- DAB radio is a digital broadcast system for radio. A high sound quality radio source is received because the frequency area boundaries change automatically. Because the radio station are selected automatically, manual selection of radio stations is unnecessary even if the broadcast area changes by the vehicle travel.

USB audio

- By connecting an on-market portable audio/USB device/USB port/SD card slot hub, audio from the external device can be listened to.

USB video

- By connecting an on-market USB device/USB port, video from the external device can be listened to.

Bluetooth® audio

- By pairing a Bluetooth®-enabled device with the CMU, audio from the Bluetooth® device can be listened to.

CD playback

- CDs and CD-R (MP3/WMA (Windows Media Audio)/AAC (Advanced Audio Coding)) can be listened to.

Gracenote

- The CMU supports Gracenote. Gracenote can perform updates by connecting a USB in which update information has been saved to the auxiliary jack/USB port/SD card slot hub.

Note

- Music recognition technology and related data are provided by Gracenote®. Gracenote is the industry standard for music recognition technology and related content delivery. For detailed information, refer to the Website (www.gracenote.com).

Centerpoint®*1

- Centerpoint® is a virtual surround sound function for vehicles. The 5.1-channel surround signal converted using an independently optimized algorithm delivers three-dimensional, well-balanced surround acoustics from the 9 speakers equipped on the vehicle to passengers. Centerpoint® can be set to ON/OFF.

*1 :Centerpoint® is a registered trademark of Bose Corporation.

Communication function

SMS (Short Message Service)

- By pairing a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone to the CMU, and SMS received by these mobile devices can be viewed on the center display.

Bluetooth® (Hands-Free) function

- Answering and receiving telephone calls can be performed without having to directly connect a Bluetooth®-enabled mobile device such as a mobile phone or Smartphone.

Navigation function

Map display, route guidance

- Calculates routes to the destination set by the user and provides guidance using maps and audio.

Turn-by-turn (TBT)

- Direction heading and distance to branch points are displayed in the active driving display.

Setting function

Bluetooth®pairing

- Pairing of a Bluetooth®-enabled device can be performed.

Note

- For the Bluetooth®pairing set up method, refer to the Bluetooth®PAIRING PROCEDURE in the workshop manual.

Clock settings

- The following items can be set using the clock setting.

Item	Content
Manual Time Adjustment	Displays the currently set time. When + is selected, the time/minutes move forward, and when - is selected, the time/minutes move back. AM/PM selection is only possible during 12-hour clock time display.
GPS Time Synchronization	<p>Synchronizes to the GPS time.</p> <p>Note</p> <ul style="list-style-type: none"> • When GPS sync is selected, "Adjust Time" cannot be selected.
24-Hour Clock	Changes the display between 12 and 24-hour clock time.
Daylight Saving Time	Enables or disables daylight saving time.
Time Zone	Selects the time zone.

Driver settings

- The following items can be set using the driver setting.

Item	Content
Driver Identification	Automatically identifies the driver based on the key.
Driver Selection	Manually selects the desired driver.
Edit Driver Name(s)	Edits the name of the selected driver.

Voice Recognition Settings

- Configures voice recognition and voice guidance settings.

Item	Content
Guidance Volume	Adjusts the volume of the Voice Guidance responses.
Guidance Length	Selects the length of Voice Guidance responses.
Barge-In	Allows user to interrupt with desired commands during Voice Guidance responses.

System setting

- The following items can be set using the system setting.

Item	Content
Tool Tips	The function for displaying supplemental explanations of functions is switched on/off in conjunction with the highlighting of the commander switch operations.
Language	The language can be changed.
Temp	Switches temperature unit between °F / °C ^{*2}
Distance / Speed	The distance unit can be switched between miles/km ^{*3} .
Fuel Efficiency	Selects the desired unit of expression for fuel efficiency.
Pressure	Selects the desired unit of air pressure.
Gracenote Database Update	Gracenote is updated.
Use Gracenote Database Album Art	Utilizes Gracenote Database for displayed Album Art.
ETC Volume	Sets the alert volume for ETC notifications.
System Information	Displays system software information.
Restore All Factory Settings	Settings other than sound are reset to the factory settings.

*2 :When the temperature unit is changed using Temp, the displayed unit on the climate control unit (dial type) also changes simultaneously.

*3 :When the distance unit is changed using Distance, the displayed unit in the instrument cluster also changes simultaneously.

Display setting

- The following items can be set using the display setting.

Item	Content
Display Off	Turns off the center display screen.
Day/Night Mode	Selects the center display brightness mode.
Brightness	Adjusts the display brightness.
Contrast	Adjusts the display contrast.
Show Drive Results at Ignition Off	Provides energy efficiency results at the end of the drive.
Home Screen Clock	Selects the clock style displayed on the Home screen.
Ambient Display	Enables a simplified interface accessible from the Home screen.
Restore Factory Settings	Resets the display to the factory settings.

Sound settings

- The following settings are available for the sound quality.

Item	Content
Sound Adjustment Mode (Selects a Basic or Advanced sound adjustment)	Basic/Advanced
Bass (Bass adjustment)	+ Side: Increased bass - Side: Decreased bass
Treble (Treble adjustment)	+ Side: Increased treble - Side: Decreased treble
Equalizer (Selects or creates the desired equalizer curve)	Flat/Pop/Rock/Jazz/RB/Classical/Custom 1/Custom 2/Custom 3/Customize EQ
Listening Position (Selects the desired listening position)	Driver's Seat/All Seats
Fade (Front/rear volume adjustment)	Front side: Front speaker volume decrease Rear side: Rear speaker volume decrease
Balance (Left/right volume adjustment)	Left side: Increase left side speaker volume Right side: Right side speaker volume increase
ALC ^{*4} (Auto volume adjustment)	OFF/Level 1/Level 2/Level 3/Level 4/Level 5/Level 6/Level 7
Automatic Source Level Adjustment (Automatically stabilizes volume levels across sources)	Enable/Disable
Bose® Stereo Mode (Selects the desired stereo listening experience)	Standard/Linear

Bose® Centerpoint ^{*5} (Automatic surround level adjustment)	OFF/Level 1/Level 2/Level 3
Bose® AudioPilot ^{*5} (Automatic volume adjustment)	OFF/Level 1/Level 2/Level 3

*4 :Without Bose®;

*5 :With Bose®;

Vehicle notification and warning volume

- Adjusts the alert volume for notifications and warnings.

Content
Low/Moderate/High

Volume setting

- The volume can be adjusted by operating the volume dial on the command switch or the volume button on the steering switch.

Personalization feature setting

- The following personalization settings for the system can be changed using the center display. For details, refer to the each system personalization feature.

Application function

Fuel efficiency monitor

- The fuel consumption display displays the following information in the center display. For details, refer to the fuel consumption display of the [CENTER DISPLAY]. (SeeCENTER DISPLAY [(E)].)

— Fuel consumption

Vehicle status monitor

- The vehicle status monitor displays the following information in the center display. For details, refer to the [CENTER DISPLAY]. (SeeCENTER DISPLAY [(E)].)

— Vehicle Warning Messages

— Scheduled Maintenance

— Tire Rotation

— Oil Change

Owner's Manual

- The owner's manual displays the following information in the center display. For details, refer to the fuel consumption display of the [CENTER DISPLAY]. (SeeCENTER DISPLAY [(E)].)

Apple CarPlay™

- Apple CarPlay™ can operate iPhone® content such as telephone, messages, music, and maps as one function of the vehicle. For details, refer to the Apple CarPlay™ of the center display. (SeeCENTER DISPLAY [(E)].)

Android Auto™

- Android Auto™ can operate Android™ content such as telephone, messages, music, and maps as one function of the vehicle. For details, refer to the Android Auto™ of the center display. (SeeCENTER DISPLAY [(E)].)

Structural View

- Refer to the Workshop Manual for the [ENTERTAINMENT LOCATION INDEX].

Operation

Operation signal reception

- Each function of the entertainment system operates if any of the operations in the following table is performed.

×:Operates

—:Does not operate

Function		Commander switch operation	Voice recognition function operation (steering switch operation and audio signal (voice command))
Audio function	AM/FM radio	×	×
	DAB radio	×	×
	CD playback	×	×
	USB audio / USB video	×	×
	Bluetooth [®] audio	×	×
	Centerpoint ^{®*6}	—	—

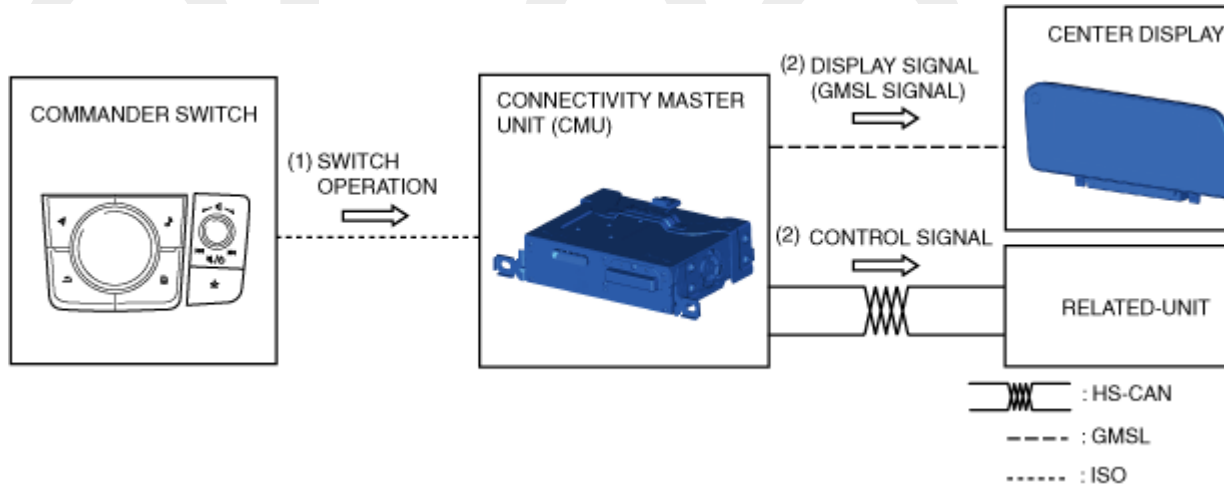
Communication function	SMS (Short Message Service)	×	×
	Bluetooth [*] (Hands-Free) function	×	×
Navigation function	Map display, route guidance	×	×
	Turn-by-turn (TBT) ^{*7}	×	×
Setting function	Bluetooth [*] pairing	×	—
	System setting	×	—
	Screen setting	×	—
	Sound setting	×	—
	Clock setting	×	—
	Personalization feature setting	×	—
	Active drive display setting	×	—
Application function	Fuel efficiency monitor	×	—
	Vehicle status monitor	×	—
	Apple CarPlay™	×	—
	Android Auto™	×	—

*6 :If the Centerpoint®setting is on, it operates automatically even if the user does not perform any operations. The Centerpoint®on/off setting can be changed by operating the center display and commander switch.

*7 :If the turn-by-turn (TBT) setting is on, it operates automatically even if the user does not perform any operations. The turn-by-turn (TBT) on/off setting can be changed by the operation of the center display and commander switch.

Operation signal reception from commander switch

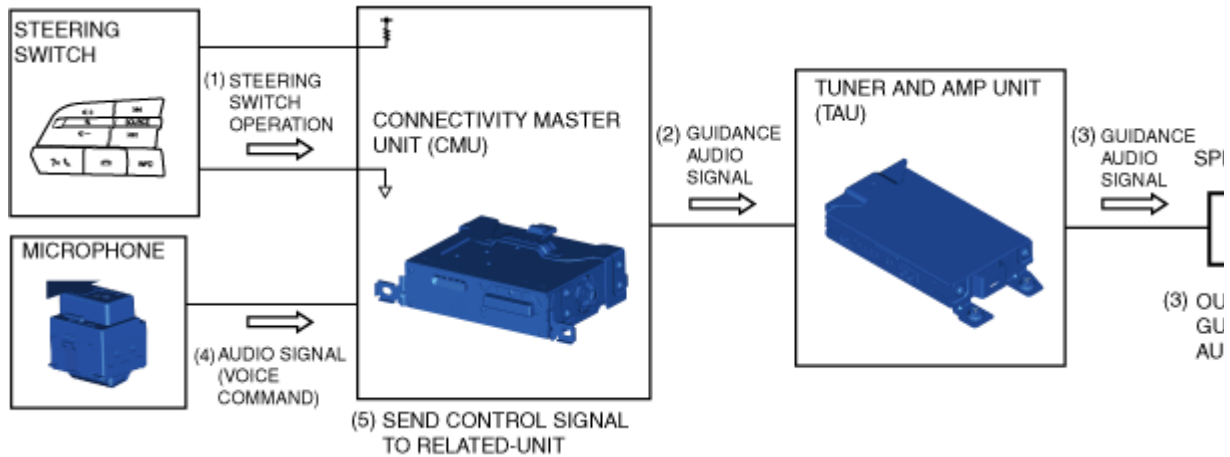
1. When the commander switch is operated, the CMU detects (1) the commander switch operation.
2. The CMU sends (2) the display signal (GMSL signal) to the center display based on the detected commander switch operation. In addition, it sends (2) a control signal to the related units.



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Operation signal reception from voice recognition function

1. When the talk button on the steering switch is pressed, the CMU detects (1) the steering switch operation.
2. When the CMU detects the steering switch operation, it sends (2) a guidance audio signal to the tuner and amp unit (TAU).
3. The TAU sends (3) the guidance audio signal to the speakers and the speakers output (3) the guidance audio.
4. The voice recognition-use microphone converts the words (voice commands) produced by the user after the guidance audio output to an audio signal and sends it to the CMU.
5. The CMU sends (5) the control signal to the related parts based on the audio signal received from the voice recognition microphone.

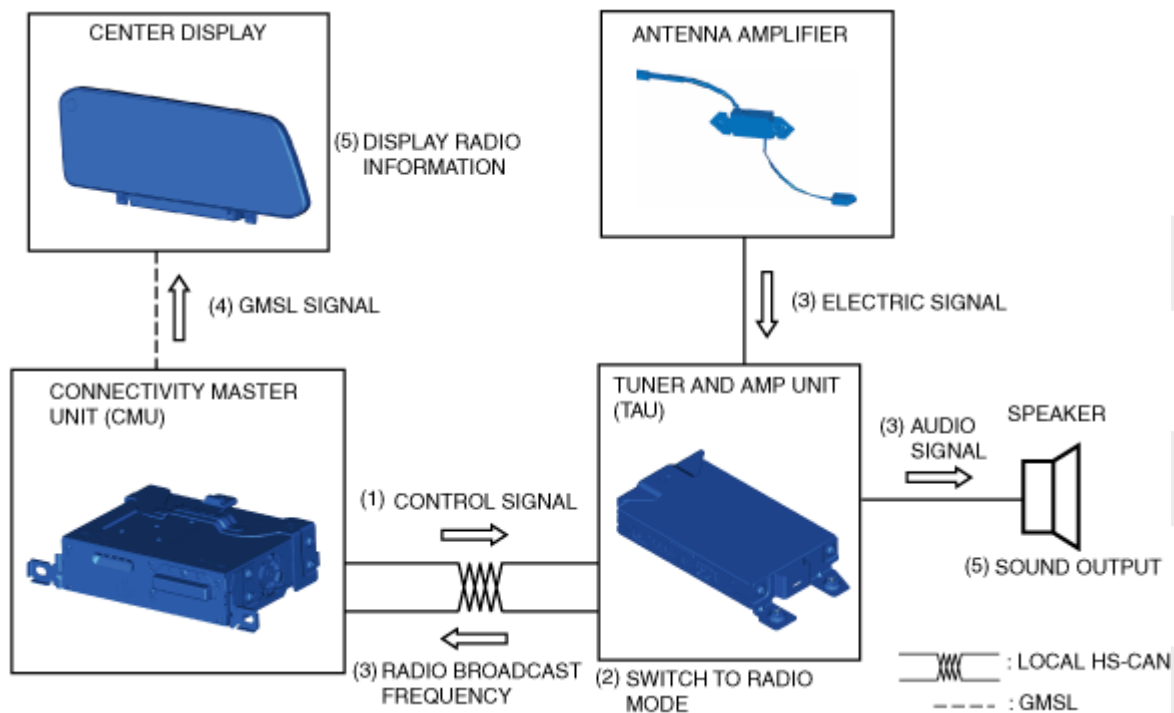


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Audio function

AM/FM radio

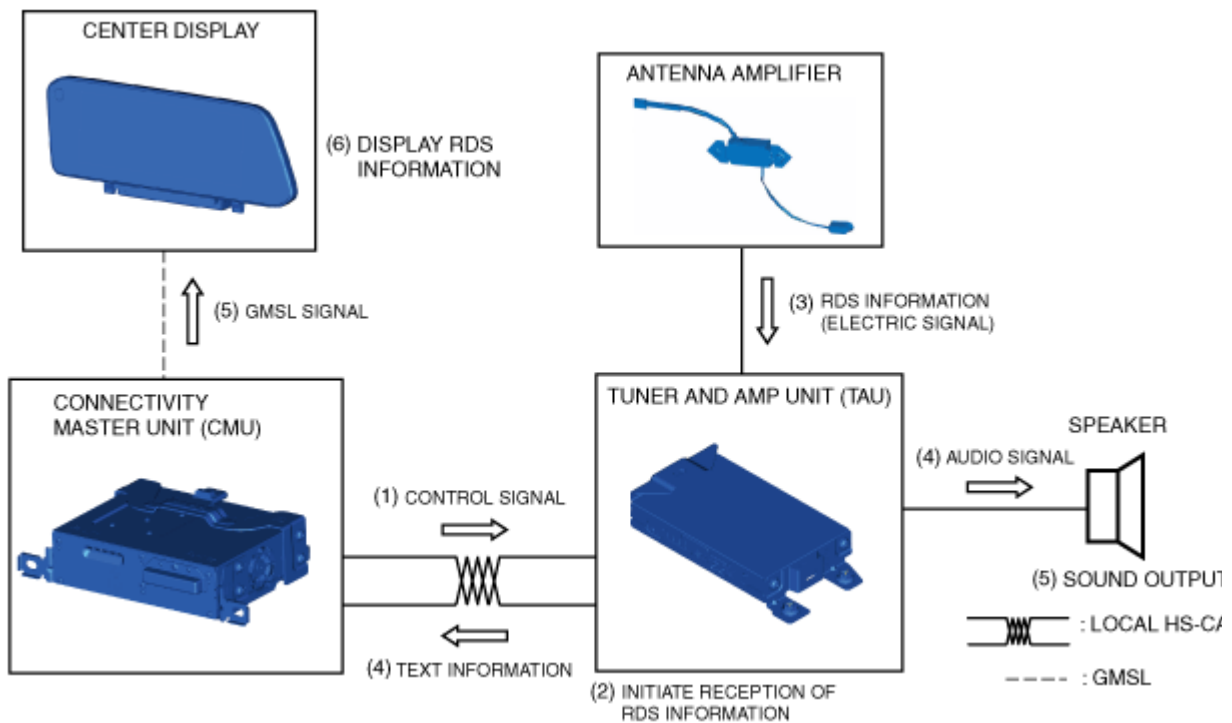
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU.
2. When the TAU receives the control signal, it switches (2) the tuner inside the TAU to radio mode and initiates reception of radio broadcasts.
3. The TAU detects the radio broadcast selected by the user using the tuner in the TAU based on the electrical signal received (3) from the center roof antenna. The audio signal of the detected radio broadcast is sent (3) to the speakers. In addition, the frequency of the detected radio broadcast is sent to the CMU.
4. The CMU converts the radio broadcast received from the TAU to a GMSL signal and sends (4) the GMSL signal to the center display.
5. The speakers output (5) the audio based on the audio signal sent from the TAU. In addition, the center display indicates (5) radio information based on the GMSL signal.



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RDS (radio data system)

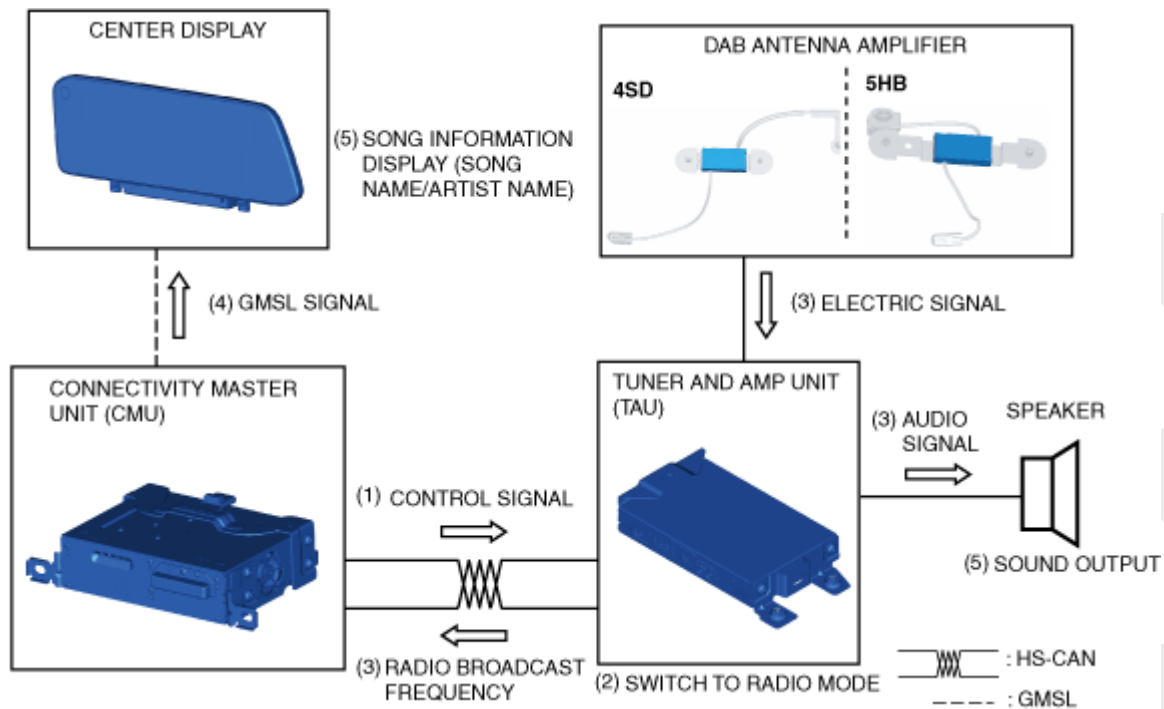
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU.
2. When the TAU receives (2) the control signal, it starts RDS reception..
3. The AM/FM antenna amplifier sends the received (3) RDS information (electrical signal) to the TAU.
4. The TAU sends (4) text information to the CMU based on the received RDS information. In addition, it sends (4) the audio signal to the speakers.
5. The CMU converts the received (5) text information to a GMSL signal and sends it to the center display.
6. The center display (6) indicates the RDS information based on the received GMSL signal. In addition, the speakers output (6) the audio based on the received audio signal.



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DAB radio

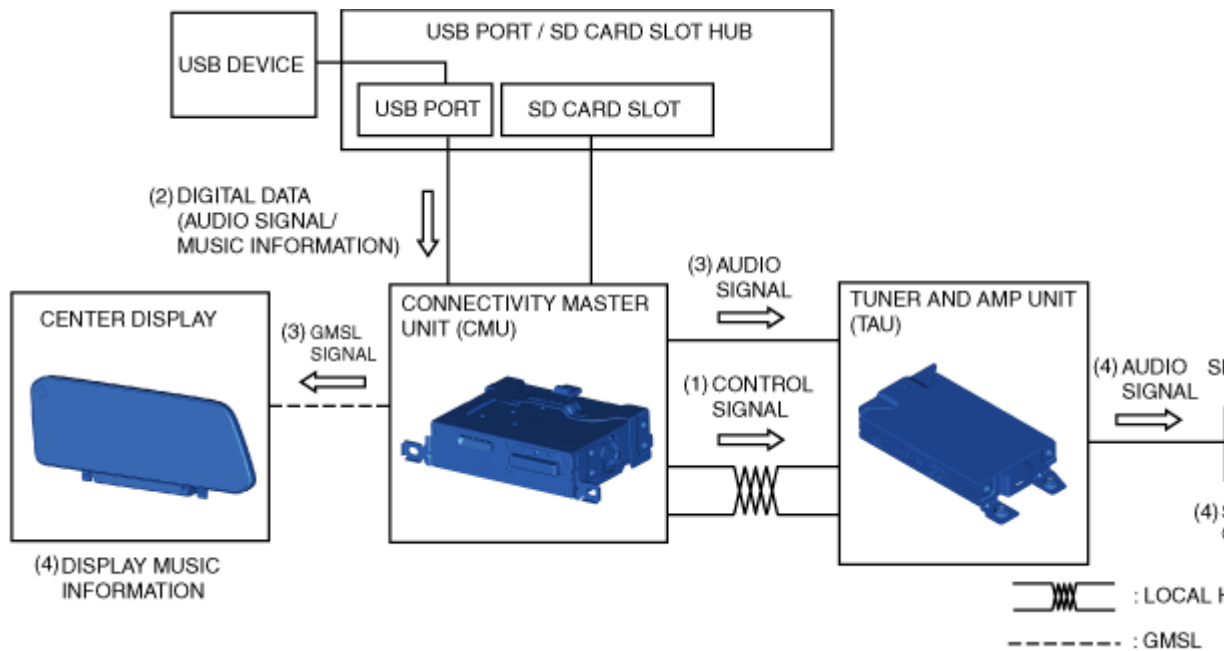
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU.
2. When the TAU receives the control signal, it switches (2) the tuner inside the TAU to radio mode and initiates reception of radio broadcasts.
3. The TAU detects the radio broadcast from the received (3) electric signal from the DAB antenna amplifier, at the tuner in the TAU. The audio signal of the detected radio broadcast is sent (3) to the speakers. In addition, the frequency of the detected radio broadcast is sent to the CMU.
4. The CMU converts the radio broadcast received from the TAU to a GMSL signal and sends (4) the GMSL signal to the center display.
5. The speakers output (5) the audio based on the audio signal received from the TAU. In addition, the center display indicates (5) music information (song name/artist name) based on the GMSL signal.



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USB audio/USB video

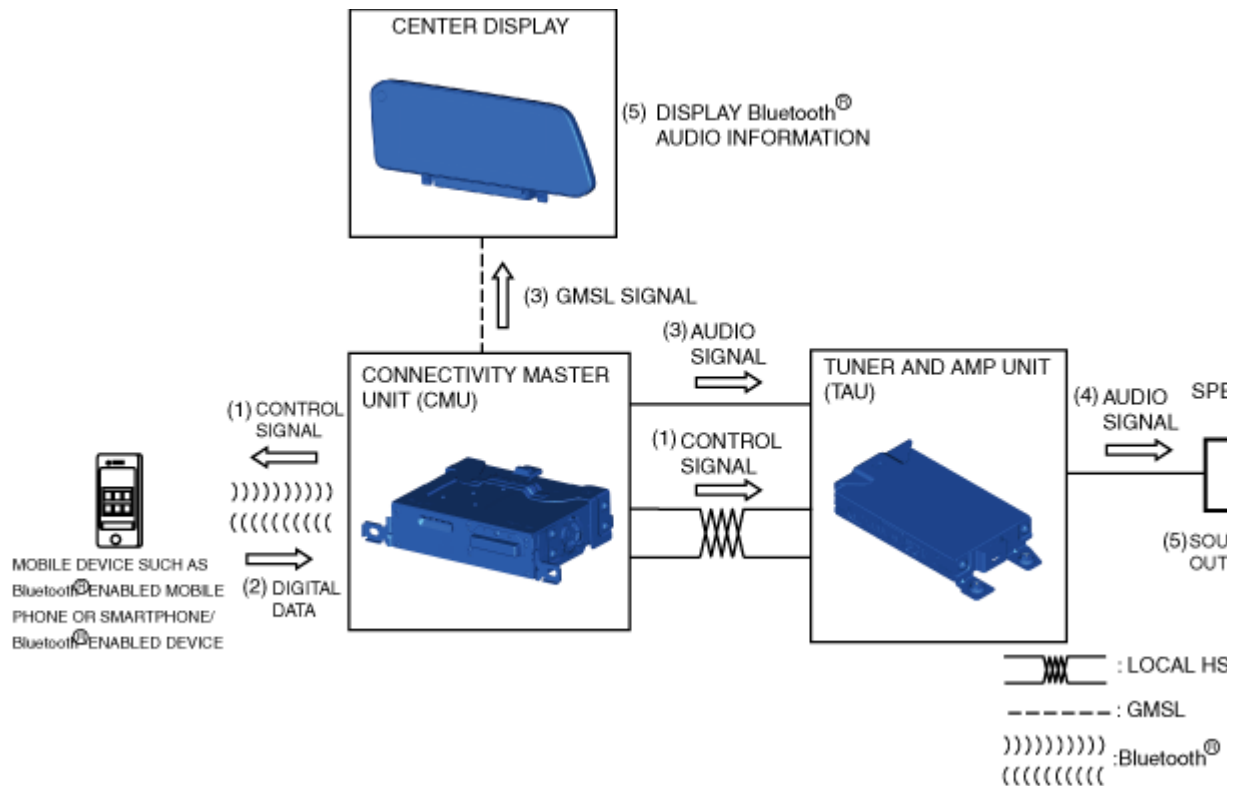
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU.
2. The auxiliary jack/USB port/SD card slot hub sends (2) the digital data (audio signal/music information such as album name or artist name) of the USB device/iPod connected to the USB port to the CMU.
3. The CMU transmits (3) the received audio signal to the TAU, converts music information to a GMSL signal, and sends (3) it to the center display.
4. The center display indicates (4) the music information based on the GMSL signal received from the CMU. In addition, the TAU sends (4) the received audio signal to the speakers and the speakers output (4) the audio based on the received audio signal.



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Bluetooth® audio function

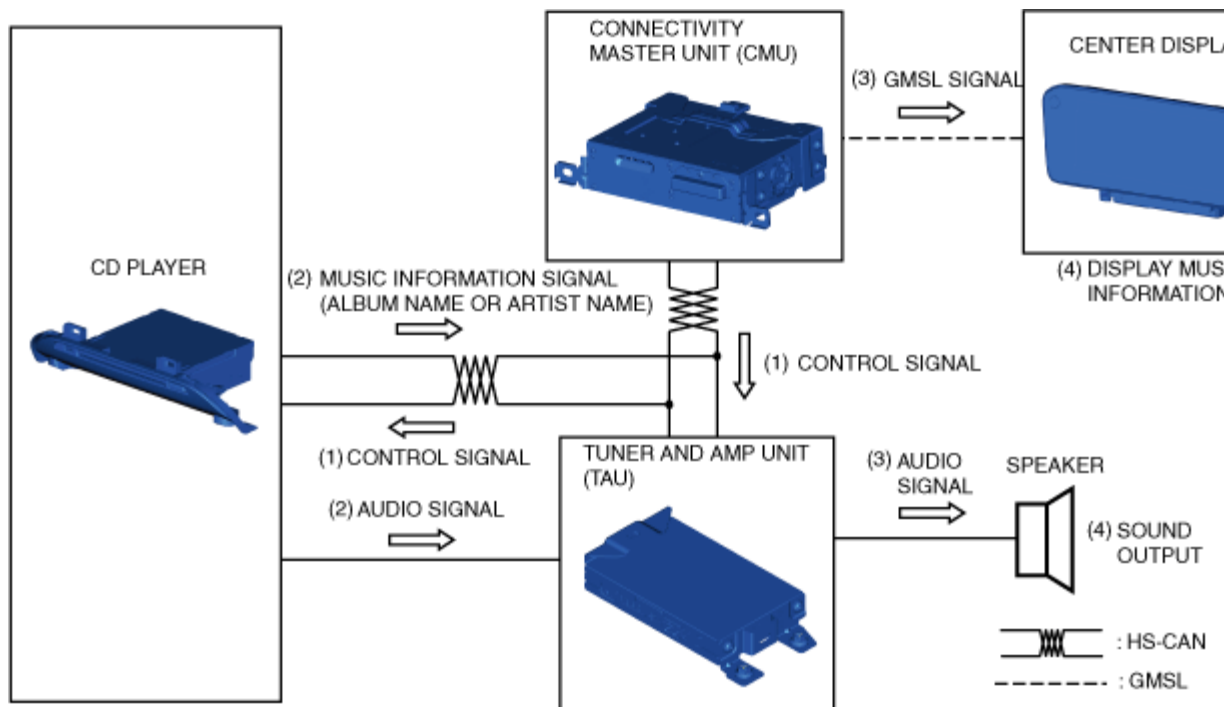
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU and a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone.
2. When the mobile device such as a Smartphone or a Bluetooth®-enabled device receives the control signal, the digital data is sent (2) to the CMU.
3. The CMU converts the video signal of the digital data to a GMSL signal and sends (3) it to the center display. In addition, it sends (3) the audio signal to the TAU.
4. The TAU sends (4) the received audio signal to the speakers.
5. In addition, the center display indicates (5) Bluetooth® audio information based on the GMSL signal. In addition, the speakers output (5) the audio based on the received audio signal.



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CD playback

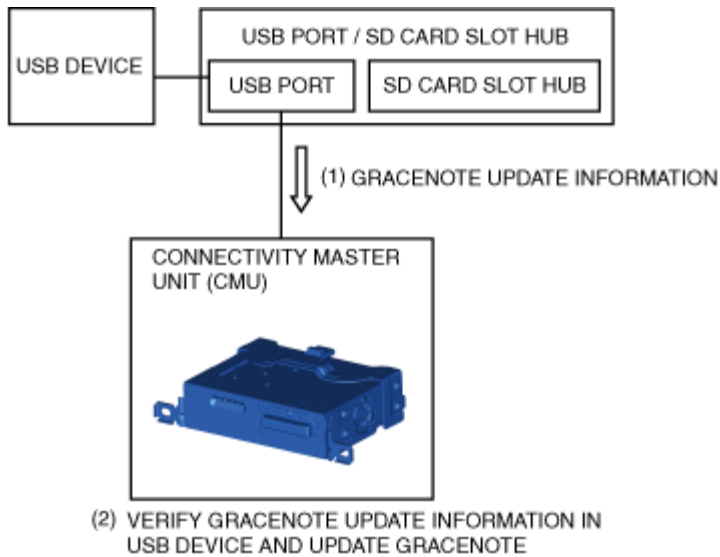
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU. In addition, the control signal is sent (1) to the CD player.
2. When the CD player receives the control signal, it sends (2) music information such as the album name and artist name of the inserted CD to the CMU, and it sends (2) the audio signal to the TAU.
3. The CMU converts the received music information signal to a GMSL signal and sends (3) it to the center display. The TAU sends (3) the received audio signal to the speakers.
4. The center display indicates (4) the music information signal based on the GMSL signal. In addition, the speakers output (4) the audio based on the received audio signal.



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Gracenote updating

1. The USB port/SD card slot hub sends (1) the Gracenote update information on the USB device.
2. The CMU verifies the Gracenote update information received from the USB port/SD card slot hub and performs (2) the update.

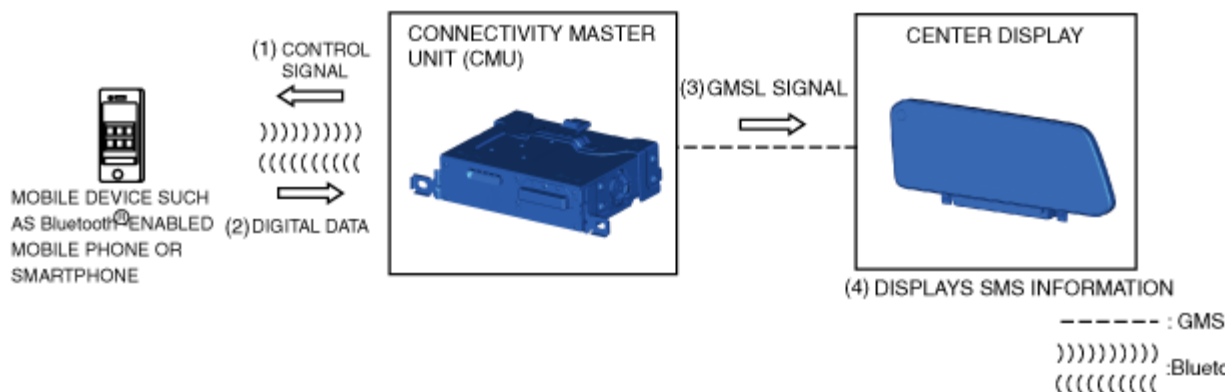


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Communication function

SMS (Short Message Service)

1. When the CMU receives the operation signal/detects the switch operation, it sends (1) a control signal to a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone.
2. When the mobile device such as a Smartphone or a Bluetooth®-enabled device receives the control signal, the digital data is sent (2) to the CMU.
3. The CMU converts the video signal of the digital data to a GMSL signal and sends (3) the GMSL signal to the center display.
4. The center display indicates the SMS information based on the received GMSL signal.



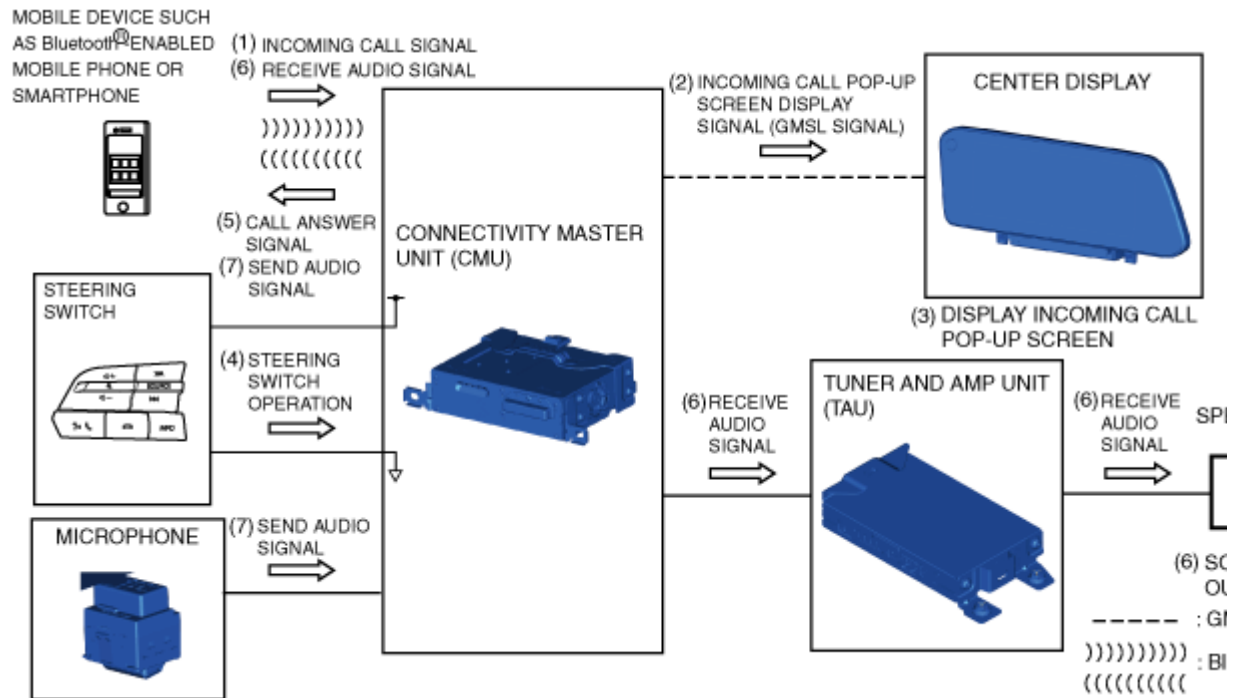
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Bluetooth®(Hands-Free) function (incoming calls)

1. When an incoming call is received, a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone sends (1) the incoming call signal to the CMU.
2. When the CMU receives the incoming call signal, it sends (2) the incoming call pop-up screen display signal (GMSL signal) to the center display.
3. When the center display receives the incoming call pop-up screen display signal (GMSL signal), it displays (3) the incoming call pop-up screen.
4. If the pick-up button on the steering switch is pressed while the incoming call pop-up screen is displayed, the CMU detects (4) the steering switch operation.
5. When the CMU detects the steering switch operation, it sends (5) the call answer signal to a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone, and the call is initiated.
6. The mobile device, such as a Bluetooth®-enabled mobile phone or a Smartphone, sends (6) the received audio signal to the CMU, and the signal is output (6) from the speakers via the TAU.
7. The voice recognition-use microphone sends the send audio signal of the user to the CMU, and the CMU sends (7) the received send audio signal to a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone.

Note

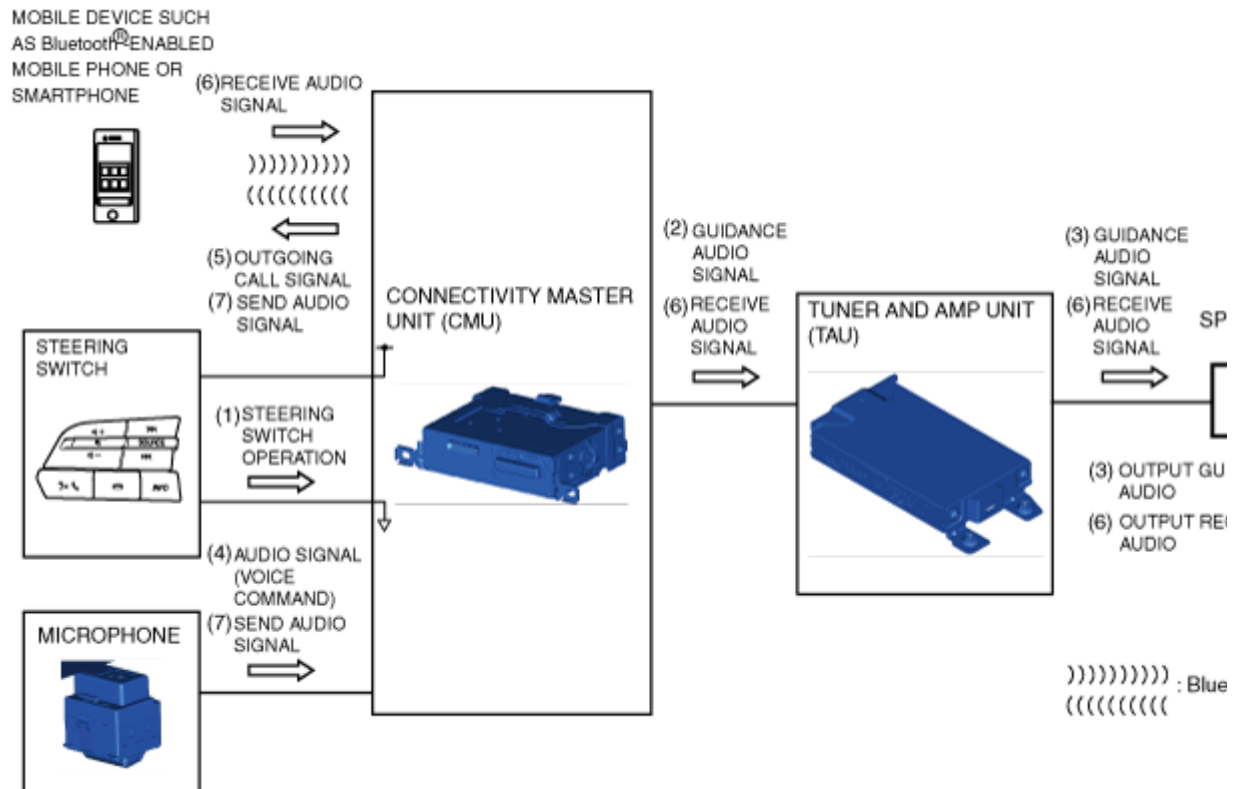
- When the call initiates, the incoming call pop-up screen switches to the call screen.



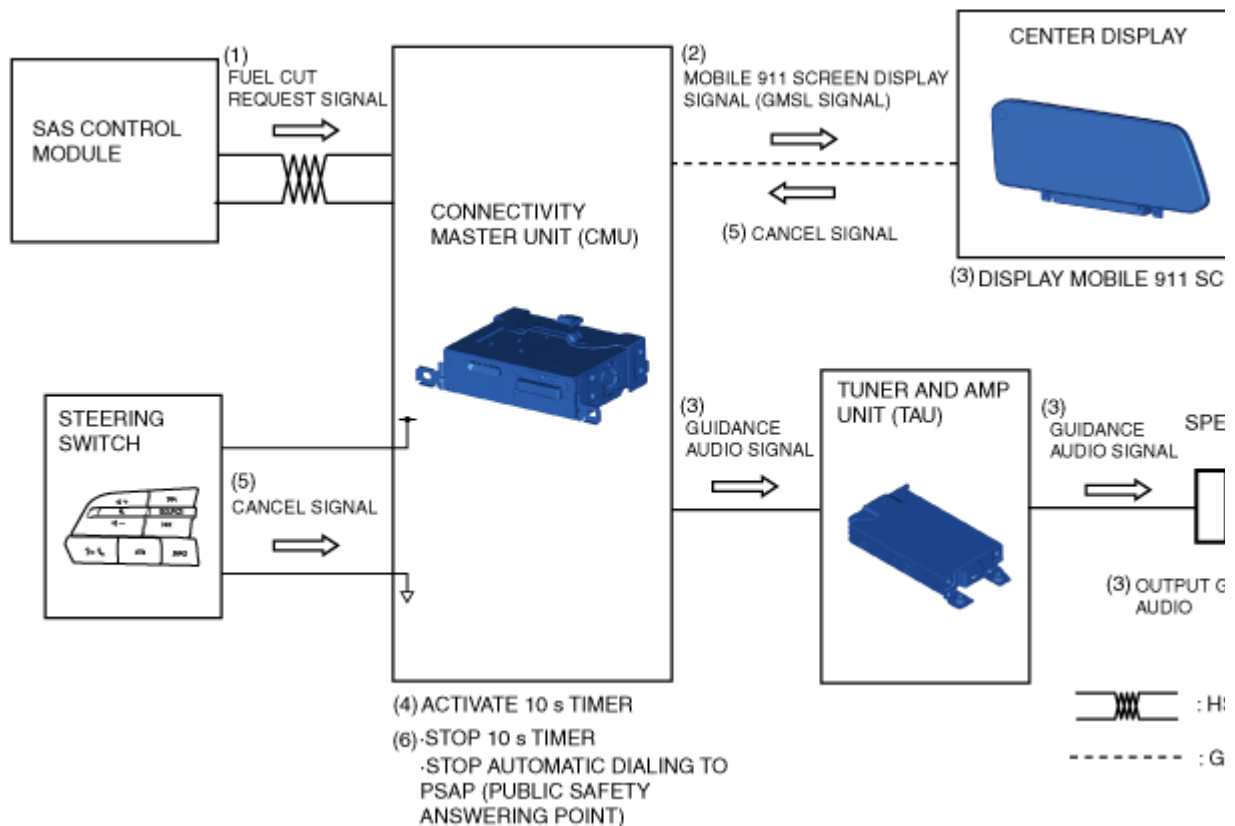
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Bluetooth® (Hands-Free) function (outgoing calls)

1. When the talk button on the steering switch is pressed, the CMU detects (1) the steering switch operation.
2. When the CMU detects the steering switch operation, it sends (2) a guidance audio signal to the TAU.
3. The TAU sends (3) the guidance audio signal to the speakers and the speakers output (3) the guidance audio.
4. The voice recognition-use microphone converts the words (voice commands) produced by the user after the guidance audio output to an audio signal and sends it to the CMU.
5. When the CMU receives the audio signal from the voice recognition-use microphone, it sends (5) an outgoing call signal to a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone, and the call is initiated.
6. The mobile device, such as a Bluetooth®-enabled mobile phone or a Smartphone, sends (6) the received audio signal to the CMU, and the signal is output (6) from the speakers via the TAU.
7. The voice recognition-use microphone sends the send audio signal of the user to the CMU, and the CMU sends (7) the received send audio signal to a mobile device such as a Bluetooth®-enabled mobile phone or a Smartphone.



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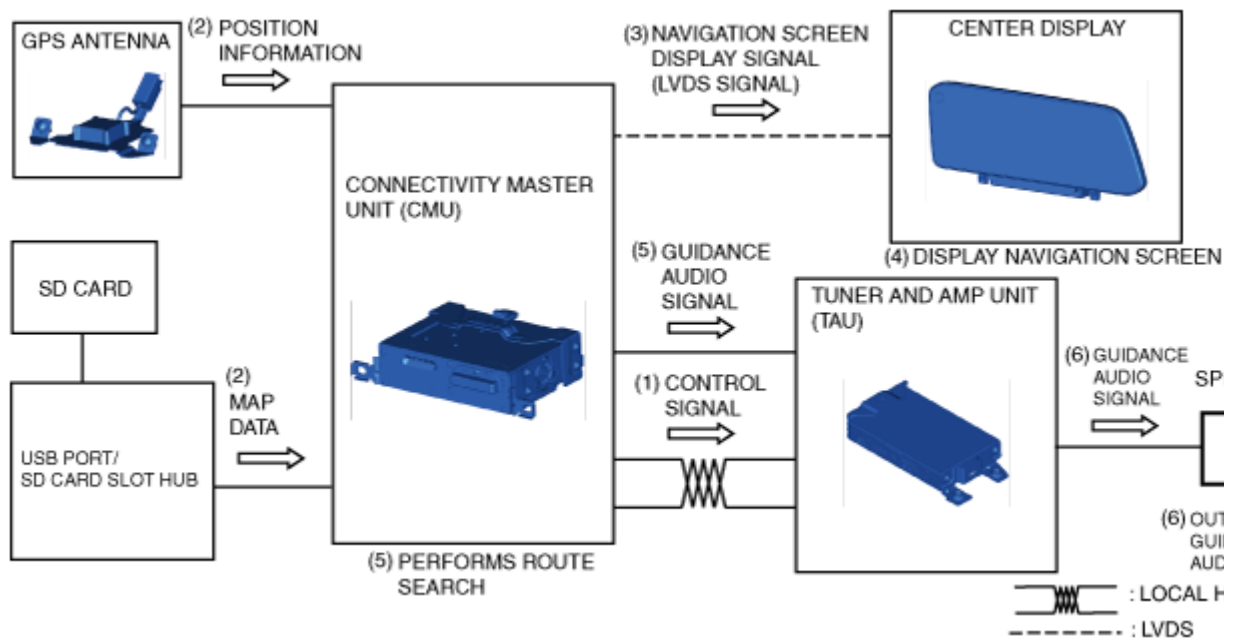


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Navigation function

Map display, route guidance

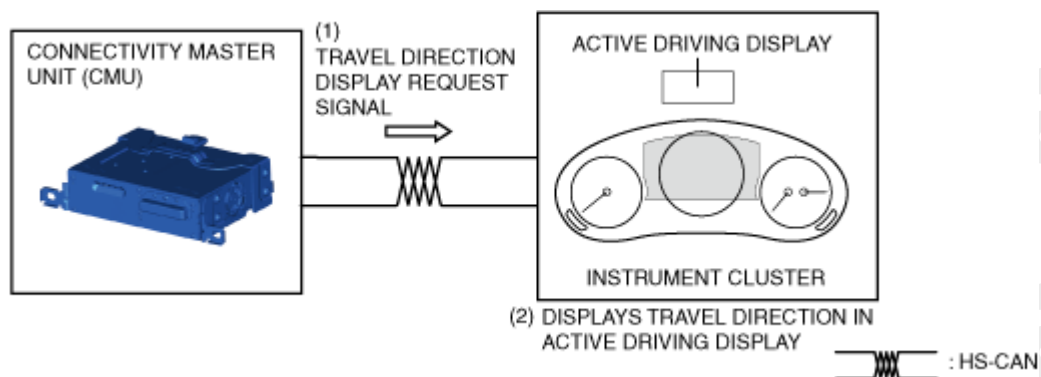
1. When the CMU receives the operation signal/detects the switch operation, it sends (1) the control signal to the TAU.
2. The CMU reads (2) the map information of the SD card inserted in the auxiliary jack/USB port/SD card slot hub. In addition, reception of the position information from the GPS antenna is initiated.
3. The CMU sends (3) the navigation screen display signal (GMSL signal) to the center display based on the SD card map information and the position information from the GPS antenna.
4. The center display displays (4) the navigation screen based on the received navigation screen display signal (GMSL signal).
5. The CMU detects (5) the route to the destination set by the user and sends (5) the guidance audio signal to the TAU after deciding the route.
6. The TAU sends (6) the guidance audio signal to the speakers and the speakers output (6) the guidance audio.



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Turn-by-turn (TBT)

1. The CMU sends (1) the travel direction display request signal to the instrument cluster.
2. The instrument cluster displays (2) the travel direction in the active driving display based on the received travel direction display request signal.



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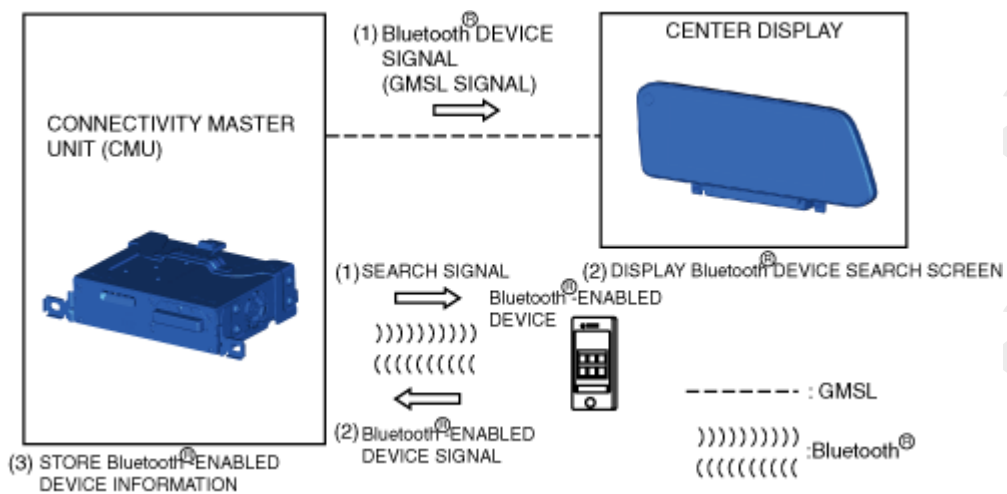
Setting function

Bluetooth®pairing

1. When the CMU receives the operation signal/detects the switch operation, it transmits a search signal to a Bluetooth-enabled device near the CMU and sends (1) the Bluetooth-device search screen signal to the center display.
2. The Bluetooth-enabled device near the CMU sends (2) a Bluetooth-device signal to the CMU. In addition, the center display displays (2) the Bluetooth-device search screen.
3. The CMU programs (3) the Bluetooth-enabled device information based on the Bluetooth-device signal.

Note

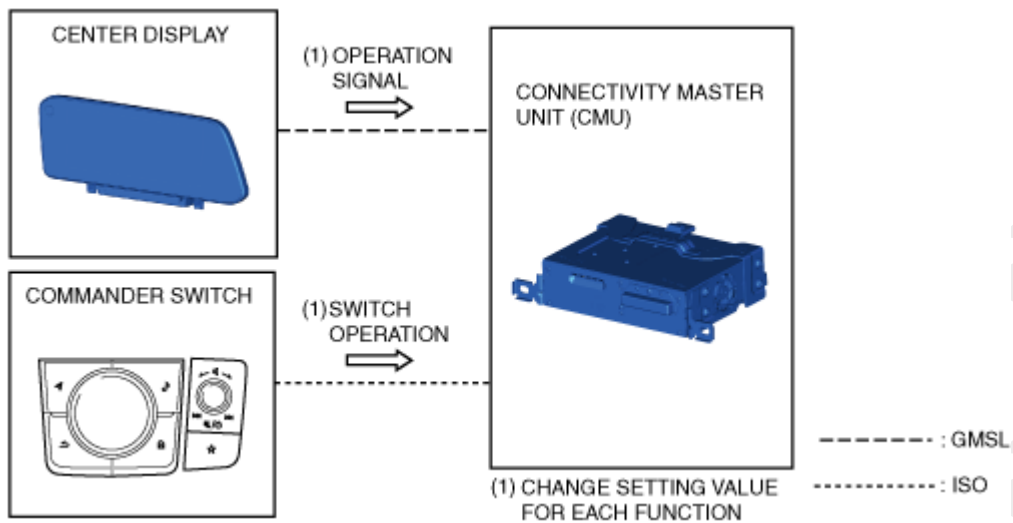
- In the following cases, Bluetooth pairing is canceled.
 - Eight (maximum of 7) Bluetooth devices have been programmed
 - Bluetooth device signal is not received during period of 180 s
 - Cancel is selected during Bluetooth device search screen display



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System/screen/clock settings

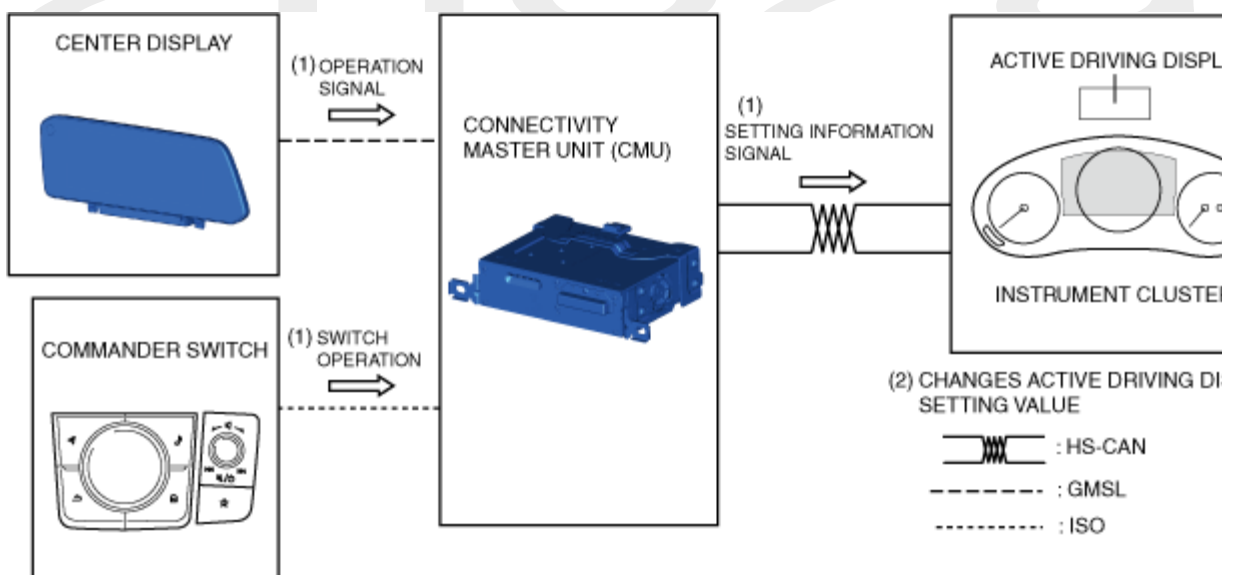
1. When the ACU receives the operation signal/detects (1) the switch operation, it changes (1) each function setting based on the information from the user operations.



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Active driving display setting

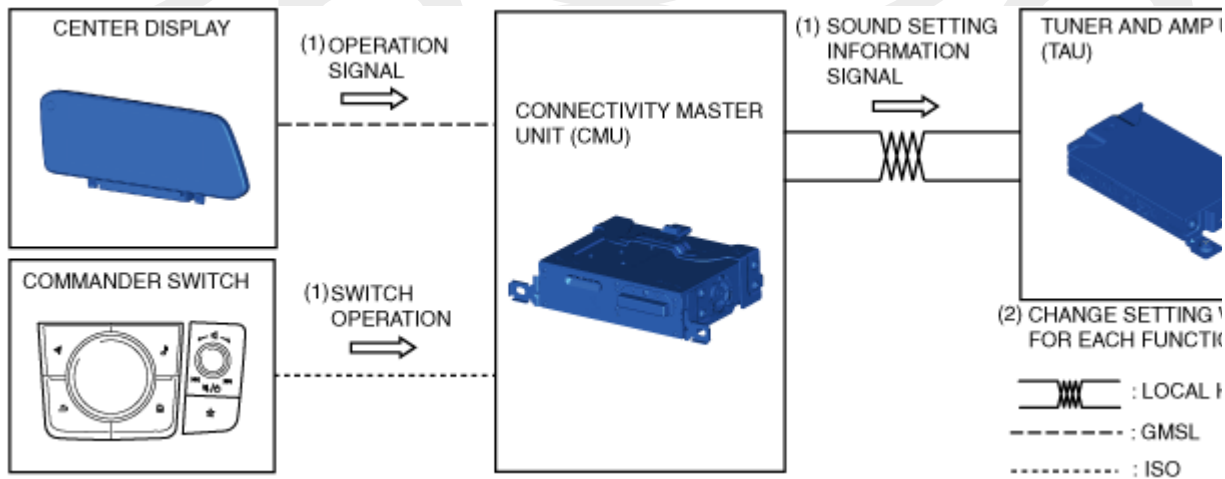
1. When an operation signal is received/switch operation is detected (1), the CMU sends (1) a setting information signal to the instrument cluster based on the information from the user operations.
2. The instrument cluster changes (2) the setting value of the active driving display based on the setting information signal.



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Sound setting (sound quality setting/volume setting)

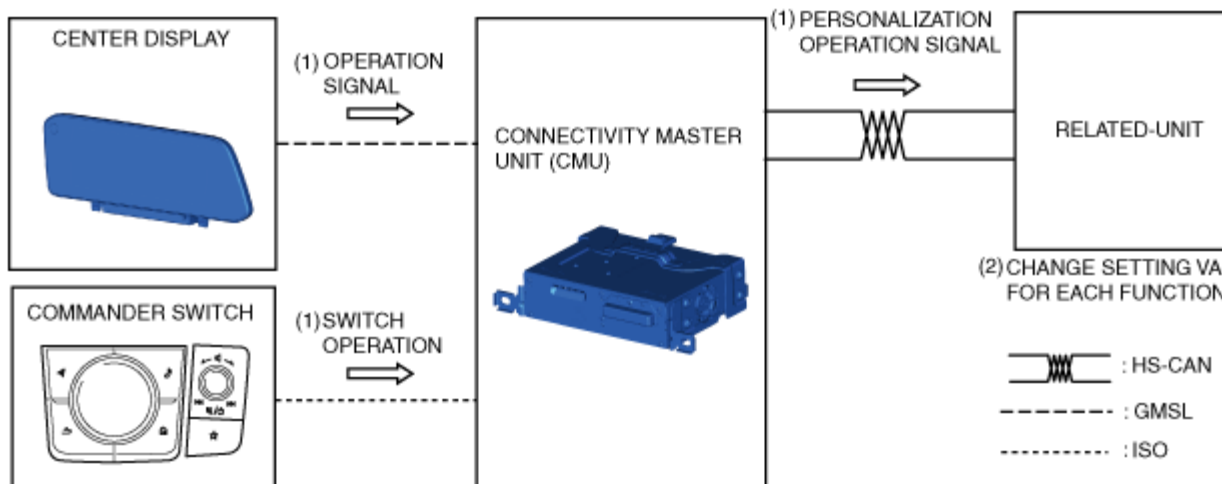
1. When an operation signal is received/switch operation is detected (1), the CMU sends (1) a sound setting information signal to the TAU based on the information from the user operations.
2. The TAU changes (2) the setting value for each function based on the received sound setting information signal.



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Personalization feature setting

1. When an operation signal is received/switch operation is detected (1), the CMU sends (1) a personalization operation signal to the related units based on the personalization setting information set by the user.
2. The related unit changes (2) each function setting based on the personalization operation signal.



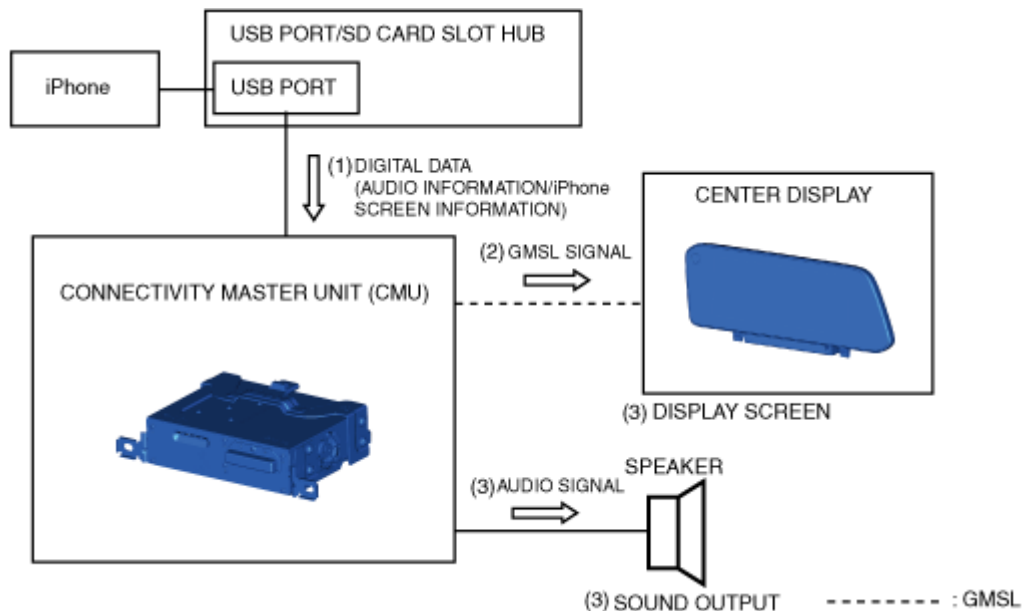
bmcozp00000390

Apple CarPlay™

1. The auxiliary jack/USB port/SD card slot hub sends (1) the digital data (audio information/iPhone®; screen information) of the iPhone®; connected to the USB port to the CMU.
2. From the received digital data, the CMU converts the screen information to an GMSL signal and sends (2) it to the center display.
3. The center display indicates (3) the screen information based on the GMSL signal received from the CMU. In addition, the CMU sends (3) the audio signal to the speakers and the speakers output (3) the audio based on the received audio signal.

Note

- Apple CarPlay™ can be used only when iPhone®; is connected to USB1 (USB port indicated by 1 mark) of the auxiliary jack/USB port/SD card slot hub.



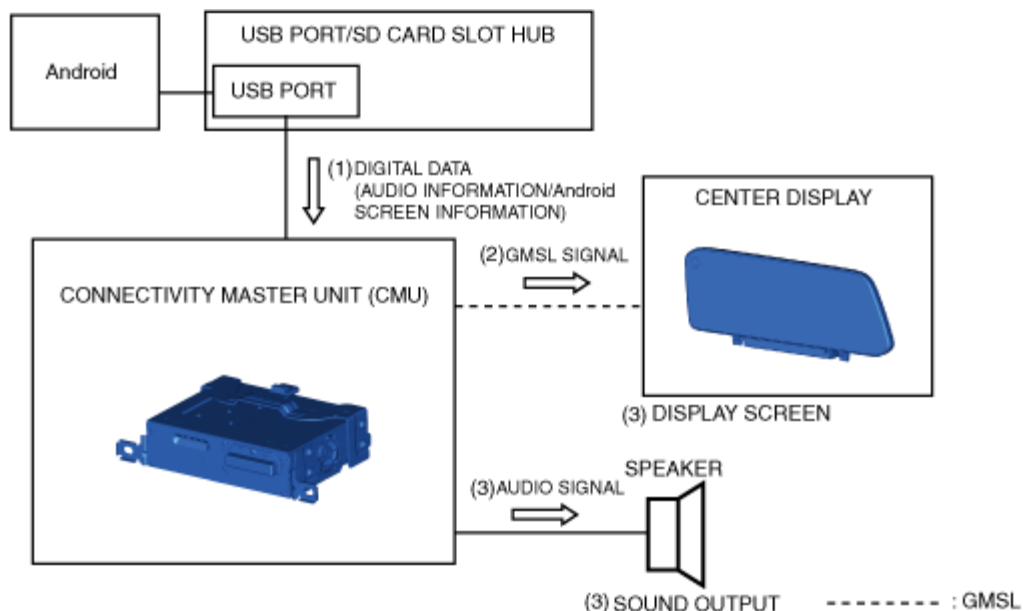
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Android Auto™

1. The auxiliary jack/USB port/SD card slot hub sends (1) the digital data (audio information/Android™ screen information) of the Android™ connected to the USB port to the CMU.
2. From the received digital data, the CMU converts the screen information to an GMSL signal and sends (2) it to the center display.
3. The center display indicates (3) the screen information based on the GMSL signal received from the CMU. In addition, the CMU sends (3) the audio signal to the speakers and the speakers output (3) the audio based on the received audio signal.

Note

- Android Auto™ can be used only when Android™ is connected to USB1 (USB port indicated by 1 mark) of the auxiliary jack/USB port/SD card slot hub.



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Application function

Fuel efficiency monitor

- For details on the fuel efficiency monitor operation, refer to the fuel efficiency monitor of the [CENTER DISPLAY.] (SeeCENTER DISPLAY [(E)].)

Vehicle status monitor

- For details on the vehicle status monitor operation, refer to the [CENTER DISPLAY.] (SeeCENTER DISPLAY [(E)].)