



# **Audio UART Command Set (V2.09)**

# Audio UART Command Set

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# Audio UART Command Set

## 3 GENERAL DESCRIPTION

This document describes all the UART command set of MCHP Bluetooth audio firmware. UART command set includes UART command and UART event. Each command and event are used under different scenario. The following sections will provide the commands and event structure with parameters settings.

Different audio firmware support different UART command and different UART event. For example, UART command 0x08 is supported in DSPK2.1.x and MSPK 1.3.x but not available in MSPK2 and AT FW.

More details please refer to AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx

Command ID	Command	dual mode SPK 2.1	multi-SPK Flash V1.3	multi-SPK Flash V2.0	Audio Transceiver
0x04	Music Control	●	●	●	●
0x05	Change_Device_Name	●	●	●	●
0x06	Change_PIN_Code	●	●	●	●
0x07	BTM_Parameter_Setting	●	●	●★★	●★★
0x08	Read_BT_Version★	●	●		
0x09	Get_PB_By_AT_Cmd				
0x0A	Vendor_AT_Command	●	●		
0x0B	AVC_Specific_Cmd	●	●	●★★★	
0x0C	AVC_Group_Navigation	●	●		
0x0D	Read_Link_Status	●	●	●	●
0x0E	Read_Paired_Device_Record	●	●	●	●
0x0F	Read_Local_BD_Address	●	●	●	●
0x10	Read_Local_Device_Name	●	●	●	●
0x11	Set_Access_PB_Method				

## 4 MCU INTERFACE

### 4.1 PIN definition

Name	Type	Description	BM62/BM64 Define	BM83 Define
UART_TXD (Mandatory)	Output		HCI_TXD	HCI_TXD
UART_RXD (Mandatory)	Input		HCI_RXD	HCI_RXD
UART_TX_IND (Optional)	Output	Firmware inform Host MCU that UART data will be transmitted out after a duration (Setting by UI Tool, default 9.375ms)	P0_0/P3_7	Configurable
UART_RX_IND (Optional)	Input	Host MCU inform <b>Firmware</b> that UART data will be transmitted out after a duration	MFB	N/A

### 4.2 UART Protocol

The UART protocol structure is shown as below.

## Audio UART Command Set

	HEAD		MID	DATA	CRC
	START	LENGTH	OP Code	PARAMETER	CHKSUM
BYTE NO	0	1 ~ 2	3	4 ~ XX	Length + 3
SIZE (BYTE)	1	2	1	0~	1
VALUE	0xAA	1~	Command/Event	Command/Event parameter	Check sum
	SYNC WORD	Check sum to be calculated			
		TARGET LENGTH			

Check sum is calculated by the following equation:

Check sum rule: Summation of every byte after START WORD(LENGTH, COM.ID, COM PARAM, CHK SUM) is 0xXX00

For example, the following checksum will be

$$\text{NOT}(0x00 + 0x02 + 0x01 + 0x00) + 0x01 = 0xFC + 0x01 = 0xFD$$

	START	LENGTH(H)	LENGTH(L)	OP CODE	PARAMETER	CHKSUM
BYTE NO	0	1	2	3	4	5
VALUE	0xAA	0x00	0x02	0x01	0x00	0xFD

There is one EEPROM option (0xAE @ bit 4) to add one byte "0x00" as wakeup byte in front of start byte (0xAA) in UART event. This option is on by default.

Note: the wakeup byte feature is not supported by MSPKv2 and Audio Transceiver in turnkey solution but for SDK solution, feature could be added by customer.

	Wakeup	START	LENGTH(H)	LENGTH(L)	OP CODE	PARAMETER	CHKSUM
BYTE NO	0	1	2	3	4	5	6
VALUE	0x00	0xAA	0x00	0x02	0x01	0x00	0xFD

### 4.3 UART configuration

- Baud Rate Setting: 2400bps~921600bps (default 115200bps configured in UI Config Tool)
- No Flow Control is needed

### 4.4 UART data exchange for low power mode

1. Signal of UART\_TX\_IND and UART\_RX\_IND are required to guarantee the correction of UART data.

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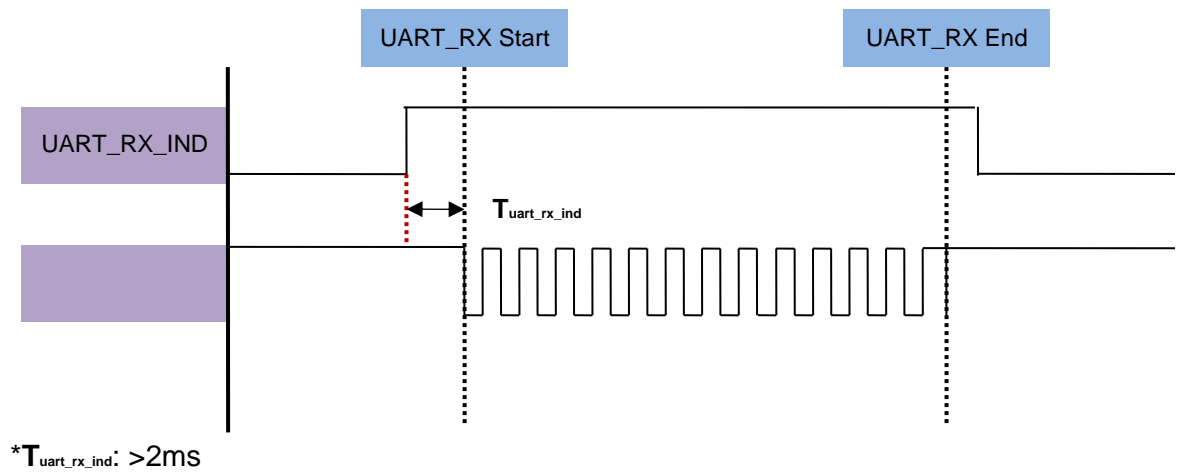
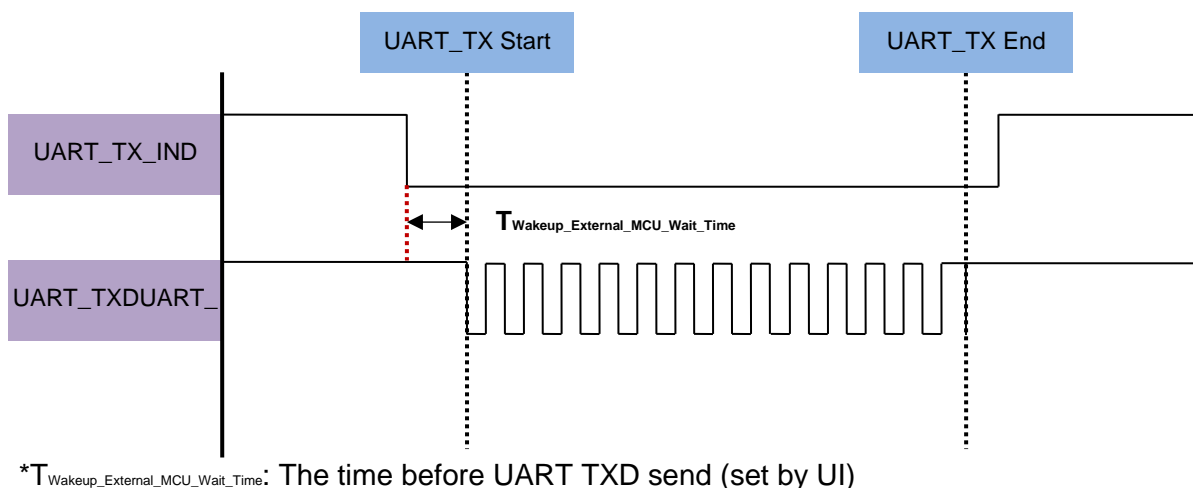


Fig 2.4.1 Host MCU indicate MSPK UART data diagram

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\* $T_{\text{Wakeup\_External\_MCU\_Wait\_Time}}$ : The time before UART TXD send (set by UI)

Default value of  $T_{\text{Wakeup\_External\_MCU\_Wait\_Time}}$  is 9.375 msec

Fig 2.4.2 MSPK indicate Host MCU UART data timing diagram

## 4.5 UART packet process rule

### 4.5.1 Command Packet Handling

For every command received from MCU, firmware will send the ACK. If ACK is not received by MCU within the 200ms, then MCU has to re send the same command. After re sending the command also if there is no ACK then MCU can reset the firmware.

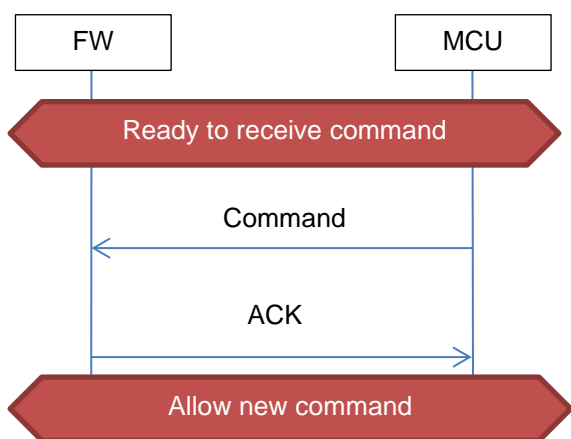


Fig 2.5.1: For the command received from MCU, firmware sent an ACK

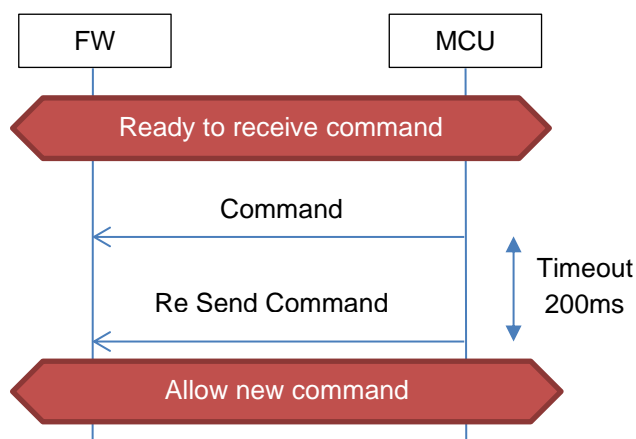


Fig 2.5.2: After sending the command, MCU did not receive the ACK within 200ms, MCU need to resend the same command

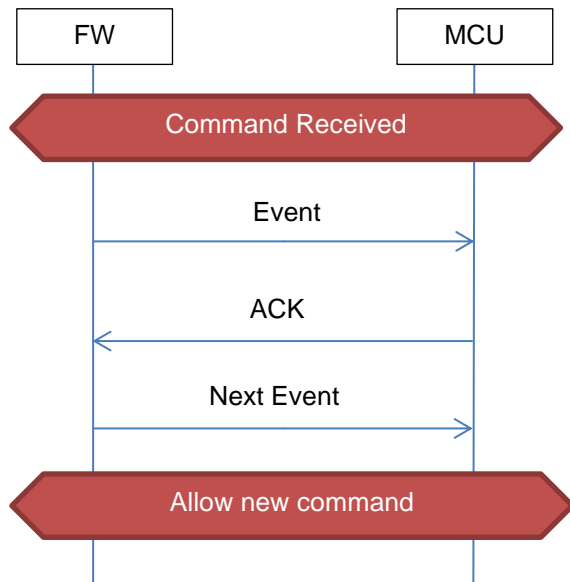
If the precondition is not met for any of the commands, then, the firmware will send Command\_ACK Event packet with status = "command disallow". Deviation from this behavior, if any, will be mentioned in the individual command description.

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## 4.5.2 Event Packet Handling

After sending Event from Firmware to MCU, FW will wait for 800 ms timeout period. If ACK is received from MCU or timeout then the next event will be sent.



## 4.5.3 Error handling in UART command

In different version of firmware design, the error handling might be different. The designer needs to follow the appropriate working scenario to use the UART command. For example, if checksum error detected, firmware may ack with unauthenticated status.

# Audio UART Command Set

## 5 COMMAND/ EVENT OP CODE DEFINITION

### UART Command

UART Command			Support version	
OP code	Command	Return event	Start	End
0x00	Make_Call	Call_Status	V2.00	
0x01	Make_Extension_Call		V2.00	
0x02	MMI_Action		V2.00	
0x03	Event_Mask_Setting		V2.00	
0x04	Music_Control		V2.00	
0x05	Change_Device_Name		V2.00	
0x06	Change_PIN_Code		V2.00	
0x07	BTM_Parameter_Setting		V2.00	
0x08	Read_BT_M_Version	Read_BT_M_Version_Reply	V2.00	
0x09	Reserved			
0x0A	Vendor_AT_Command	Report_Vendor_AT_Event	V2.00	
0x0B	AVC_Vendor_Dependent_Cmd	AVC_Vendor_Dependent_Response	V2.00	
0x0C	AVC_Group_Navigation		V2.00	
0x0D	Read_Link_Status	Read_Link_Status_Reply	V2.00	
0x0E	Read_Paired_Device_Record	Read_Paired_Device_Record_Reply	V2.00	
0x0F	Read_Local_BD_Address	Read_Local_BD_Address_Reply	V2.00	
0x10	Read_Local_Device_Name	Read_Local_Device_Name_Reply	V2.00	
0x11	Reserved			
0x12	Send_SPP/iAP_Or_LE_Data		V2.00	
0x13	BTM_Utility_Function		V2.00	
0x14	Event_ACK		V2.00	
0x15	Additional_Profiles_Link_Setup		V2.00	
0x16	Read_Linked_Device_Information	Read_Linked_Device_Information_Reply	V2.00	
0x17	Profiles_Link_Back		V2.00	
0x18	Disconnect		V2.00	
0x19	MCU_Status_Indication			
0x1A	User_Confirm_SPP_Req_Reply		V2.00	
0x1B	Set_HF_Speaker_Gain_Level		V2.00	
0x1C	EQ_Mode_Setting	EQ_Mode_Indication	V2.00	
0x1D	DSP_NR_CTRL		V2.00	
0x1E	GPIO_Control	Report_Input_Signal_Level	V2.00	
0x1F	MCU_UART_Rx_Buffer_Size		V2.00	
0x20	Voice_Prompt_Cmd	Report_Voice_Prompt_Status	V2.00	
0x21	Reserved			
0x22	Reserved		V2.00	V2.01
0x23	Set_Overall_Gain		V2.00	
0x24	Read_BT_M_Setting	Report_Type_BT_M_Setting	V2.00	
0x25	Read_BT_M_Battery_Charge_Status	BT_M_Battery_Status BT_M_Charging_Status	V2.00	
0x26	MCU_Update_Cmd		V2.00	
0x27	Report_Battery_Capacity		V2.00	
0x28	LE_ANCS_Service_Cmd		V2.00	
0x29	LE_Signaling_Cmd		V2.00	
0x2A	MSPK_Vendor_Cmd		V2.00	



# Audio UART Command Set

0x2B	<a href="#">Read_MSPK_Link_Status</a>	<a href="#">Report_MSPK_Link_Status</a>	V2.00
0x2C	<a href="#">MSPK_Sync_Audio_Effect</a>		V2.00
0x2D	<a href="#">LE_GATT_CMD</a>		V2.00
0x2F	<a href="#">LE_App_CMD</a>		V2.00
0x30	<a href="#">Dsp_Runtime_Program</a>		V2.00
0x31	<a href="#">Read_Vendor_Stored_Data</a>	<a href="#">Report_Vendor_Stored_Data</a>	V2.00
0x32	<a href="#">Read_IC_Version_linfo</a>	<a href="#">Report_IC_Ver_Info</a>	V2.00
0x33	Reserved		V2.00
0x34	<a href="#">Read_BT_M_Link_Mode</a>	<a href="#">Report_BT_M_Link_Mode</a>	V2.00
0x35	<a href="#">Configure_Vendor_Parameter</a>		V2.00
0x36	Reserved	<a href="#">DSP_Dedicated_Event</a>	V2.00
0x37	<a href="#">MSPK_Exchange_Link_Info_Cmd</a>		V2.00
0x38	<a href="#">MSPK_Set_GIAC</a>		V2.00
0x39	<a href="#">Read_Feature_List</a>	<a href="#">Report_Read_Feature_List_Reply</a>	V2.00
0x3A	<a href="#">Personal_MSPK_GROUP_Control</a>		V2.00
0x3B	<a href="#">Test_Device</a>		V2.00
0x3C	<a href="#">Read_EEPROM_Data</a>	<a href="#">Report_Read_EEPROM_Data</a>	V2.02
0x3D	<a href="#">Write_EEPROM_Data</a>		V2.02
0x3E	<a href="#">LE_Signaling2_Cmd</a>		V2.02
0x3F	<a href="#">PBAPC_Cmd</a>	<a href="#">PBAPC_Event</a>	V2.02
0x40	<a href="#">TWS_CMD</a>	<a href="#">TWS_CMD_Event</a>	V2.03
0x41	<a href="#">AVRCP_Browsing_Cmd</a>	<a href="#">AVRCP_Browsing_Event</a>	V2.03
0x42	<a href="#">Read_Paired_Link_Key_lifo</a>	<a href="#">Report_Paired_Link_Key_Info</a>	V2.04
0x43	Reserved		
0x44	<a href="#">Audio_Transceiver_Cmd</a>	<a href="#">Audio_Transceiver_Event</a>	V2.06
0x45	Reserved		
0x46	<a href="#">Button_MMI_Setting_Cmd</a>		V2.05
0x47	<a href="#">Button_Operation_Cmd</a>		V2.05
0x48	<a href="#">Read_Button_MMI_Setting_Cmd</a>	<a href="#">Read_Button_MMI_Setting_Reply</a>	V2.05
0x49	<a href="#">DFU</a>		V2.06
0x4A	<a href="#">AVRCP_Vendor_Dependent_Cmd</a>	<a href="#">AVRCP_Vendor_Dependent_Rsp</a>	V2.06
0x4B	<a href="#">Concert Mode Endless Grouping</a>		V2.08
0x4C	<a href="#">Read_Runtime_Latency</a>	<a href="#">Runtime_Latency</a>	V2.09
0xCC	<a href="#">Toggle Audio Source</a>		V2.06

## UART Event

UART Event		Support version	
OP code	Event	Start	End
0x00	<a href="#">Command_ACK</a>	V2.00	
0x01	<a href="#">BTM_Status</a>	V2.00	
0x02	<a href="#">Call_Status</a>	V2.00	
0x03	<a href="#">Caller_ID</a>	V2.00	
0x04	<a href="#">SMS_Received_Indication</a>	V2.00	
0x05	<a href="#">Missed_Call_Indication</a>	V2.00	
0x06	<a href="#">Phone_Max_Battery_Level</a>	V2.00	
0x07	<a href="#">Phone_Current_Battery_Level</a>	V2.00	
0x08	<a href="#">Roaming_Status</a>	V2.00	
0x09	<a href="#">Phone_Max_Signal_Strength_Level</a>	V2.00	

# Audio UART Command Set

0x0A	<a href="#">Phone Current Signal Strength Level</a>	V2.00
0x0B	<a href="#">Phone Service Status</a>	V2.00
0x0C	<a href="#">BTM Battery Status</a>	V2.00
0x0D	<a href="#">BTM Charging Status</a>	V2.00
0x0E	<a href="#">Reset To Default</a>	V2.00
0x0F	<a href="#">Report HF Gain Level</a>	V2.00
0x10	<a href="#">EQ Mode Indication</a>	V2.00
0x11	Reserved	
0x12	Reserved	
0x13	Reserved	
0x14	Reserved	
0x15	Reserved	
0x16	Reserved	
0x17	<a href="#">Read Linked Device Information Reply</a>	V2.00
0x18	<a href="#">Read BTM Version Reply</a>	V2.00
0x19	<a href="#">Call List Report</a>	V2.00
0x1A	<a href="#">AVC Specific Rsp</a>	V2.00
0x1B	<a href="#">BTM Utility Req</a>	V2.00
0x1C	<a href="#">Vendor AT Cmd Rsp</a>	V2.00
0x1D	<a href="#">Report Vendor AT Event</a>	V2.00
0x1E	<a href="#">Read Link Status Reply</a>	V2.00
0x1F	<a href="#">Read Paired Device Record Reply</a>	V2.00
0x20	<a href="#">Read Local BD Address Reply</a>	V2.00
0x21	<a href="#">Read Local Device Name Reply</a>	V2.00
0x22	<a href="#">Report SPP/iAP Data</a>	V2.00
0x23	<a href="#">Report Link Back Status</a>	V2.00
0x24	<a href="#">Report Ring Tone Status</a>	V2.00
0x25	<a href="#">User Confrim SSP Req</a>	V2.00
0x26	<a href="#">Report AVRCP Vol Ctrl</a>	V2.00
0x27	<a href="#">Report Input Signal Level</a>	V2.00
0x28	<a href="#">Report iAP Info</a>	V2.00
0x29	<a href="#">Report AVRCP ABS Vol Level</a>	V2.00
0x2A	<a href="#">Report Voice Prompt Status</a>	V2.00
0x2B	Reserved	
0x2C	Reserved	V2.00
0x2D	<a href="#">Report Type Codec</a>	V2.00
0x2E	<a href="#">Report Type BTM Setting</a>	V2.00
0x2F	<a href="#">Report MCU Update Reply</a>	V2.00
0x30	<a href="#">Report BTM Initial Status</a>	V2.00
0x31	<a href="#">LE ANCS Service Event</a>	V2.00
0x32	<a href="#">LE Signaling Event</a>	V2.00

# Audio UART Command Set

0x33	<a href="#">Report MSPK Link Status</a>	V2.00
0x34	<a href="#">Report MSPK Vendor Event</a>	V2.00
0x35	<a href="#">Report MSPK Audio Setting</a>	V2.00
0x36	<a href="#">Report Sound Effect Status</a>	V2.00
0x37	<a href="#">Report Vendor Stored Data</a>	V2.00
0x38	<a href="#">Report IC Version Info</a>	V2.00
0x39	<a href="#">Report LE GATT Event</a>	V2.00
0x3A	<a href="#">Report BTM Link Mode</a>	V2.00
0x3B	Reserved	V2.00
0x3C	Reserved	V2.00
0x3D	<a href="#">Report MSPK Exchange Link Info</a>	V2.00
0x3E	<a href="#">Report Customized Information</a>	V2.00
0x3F	<a href="#">Report CSB CLK</a>	V2.00
0x40	<a href="#">Report Read Feature List Reply</a>	V2.00
0x41	<a href="#">Report Test Result Reply</a>	V2.00
0x42	<a href="#">Report Read EEPROM Data</a>	V2.02
0x43	<a href="#">PBAPC Event</a>	V2.02
0x44	<a href="#">AVRCP Browsing Event</a>	V2.03
0x45	<a href="#">Report Paired Link Key Info</a>	V2.04
0x46~0x52	Reserved	V2.01
0x53	<a href="#">Report TWS Rx Vendor Event</a>	V2.03
0x54	<a href="#">Report TWS Local Device Status</a>	V2.03
0x55	<a href="#">Report TWS VAD Data</a>	V2.03
0x56	<a href="#">Report TWS Radio Condition</a>	V2.03
0x57	<a href="#">Report TWS Ear Bud Position</a>	V2.03
0x58	<a href="#">Report TWS Secondary Device Status</a>	V2.05
0x59	Reserved	V2.05
0x5A	<a href="#">Audio Transceiver Event Status</a>	V2.06
0x5C	<a href="#">Read Button MMI Setting Reply</a>	V2.05
0x5D	<a href="#">AVRCP Vendor Dependent Rsp</a>	V2.06
0x5E	<a href="#">Runtime Latency</a>	V2.09

## 5.1 Link Database Index

In following UART Commands / Events, some of them provide data base index among parameters. The data base index is a runtime enumeration of devices in a multiple link, it is used to control which device currently connected. For backward compatibility, the command parameter description about link database only includes index 0 and index 1, but you should obtain a correct database index from Event [BTM Status](#)(0x01) regarding to status of ACL

# Audio UART Command Set

connected (x015), or profiles established (0x05, 0x06, 0x0B, 0x0D, 0x10). Use the runtime reported database index to control corresponding remote device.

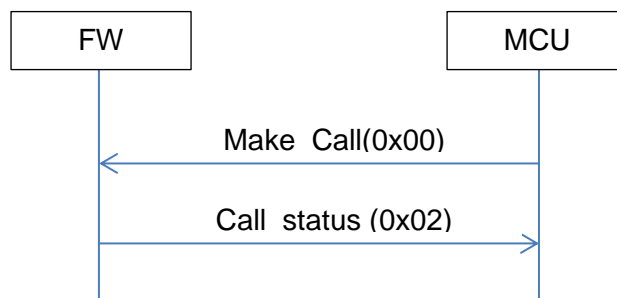
## 5.2 UART Commands

### 5.2.1 Make\_Call (0x00)

Command	Op Code	Command Parameters	Return Event
Make_Call	0x00	Data_Base_Index, Phone_Number	<a href="#">Call_Status</a>

#### Description:

This command is used to trigger HF action for making an outgoing call. Send out a standard AT command intended for placing a call to a phone number. Only voice calls are covered in this specification. Refer to Section 6.2 in [\[1\]](#).



#### Precondition:

HF should be in connected state.

#### Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Phone\_Number:* *Length: 19 Bytes*

Value	Parameter Description
0xXXXX	ASCII code of the phone number. The max length of phone number is 19

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No HF connection exist
0x03	Parameter error	No phone number

## Audio UART Command Set

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[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.2 Make\_Extension\_Call (0x01)

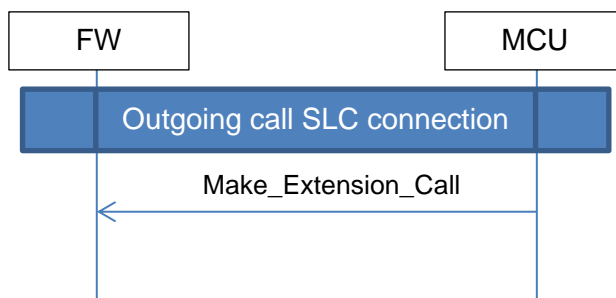
Command	Op Code	Command Parameters	Return Event
Make_Extension_Call	0x01	Data_Base_Index, Extension_Number	

#### Description:

This command is used to trigger HF action for making an extension call number. During an ongoing call, the HF transmits the AT+VTS command to instruct the AG to transmit a specific DTMF code to its network connection.

#### Precondition:

1. An ongoing Service Level Connection between the AG and the HF shall exist.
2. An ongoing call in the AG exists.



#### Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Extension\_Number:* *Length: 10 Bytes*

Value	Parameter Description
0xXXXX	ASCII code of the Extension phone number. The max length of phone number is 10 bytes

#### Return Parameters:

*Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	Command succeeded
0x01 – 0xFF	Command failed. See listing of Error Codes.

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No HF connection exist

[\[Return to Command Table\]](#)

# Audio UART Command Set

## 5.2.3 Event\_Mask\_Setting (0x03)

Command	Op Code	Command Parameters	Return Event
Event_Mask_Setting	0x03	Event_Mask	

### Description:

This command is used to control which events are to be Masked for the Host MCU. If the N-th bit in the Event\_Mask\_Setting is set to one, then the corresponding BTM event will not be reported. The Host MCU has to ACK each event generated by BTM. The event filter setting allows the Host MCU to control which events will be received. The default values of Event\_Mask Bit are all zero.

### Precondition:

None.

### Command Parameters:

*Event\_Mask:*

*Length: 4 Bytes*

Value	Parameter Description
0xFFFFFFFF	Refer the Event_Mask_Table Bit is 0:BTM will report this event Bit is 1:BTM will not report this event

*Event\_MaskTable:*

*Length: 4 Bytes*

Byte 0	Masked Event Name
Bit 0	Reserved
Bit 1	Reserved
Bit 2	0x02 Call Status
Bit 3	0x03 Call ID
Bit 4	0x04 SMS_Received_Indication
Bit 5	0x05 Missed_Call_Indication
Bit 6	0x06 Phone_Max_Battery_Level
Bit 7	0x07 Phone_Current_Battery_Level

Byte 1	Masked Event Name
Bit 0	0x08 Roaming_Status
Bit 1	0x09 Phone_Max_Signal_Strength_Level
Bit 2	0x0A Phone_Current_Signal_Strength_Level
Bit 3	0x0B Phone_Service_Status
Bit 4	0x0C BTM_Battery_Status
Bit 5	0x0D BTM_Charging_Status
Bit 6	0x0E Reset_To_Default
Bit 7	0x26 Report_AVRCP_Vol_Ctrl 0x29 Report_AVRCP_ABS_Vol_Level

## Audio UART Command Set

Byte 2	Masked Event Name
Bit 0	0x10 EQ_Mode_Indication
Bit 1	0x17 Read_Linked_Device_Information_Reply
Bit 2	0x1A AVC_Specific_Rsp
Bit 3	0x1D Report_Vendor_AT_Event
Bit 4	0x23 Report_Link_Back_Status
Bit 5	0x24 Report_Ring_Tone_Status
Bit 6	Reserved
Bit 7	Reserved

Byte 3	Masked Event Name
Bit 0	Reserved
Bit 1	Reserved
Bit 2	Reserved
Bit 3	Reserved
Bit 4	Reserved
Bit 5	Reserved
Bit 6	Reserved
Bit 7	Reserved

[\[Return to Command Table\]](#)

### 5.2.4 Music\_Control (0x04)

Command	Op Code	Command Parameters	Return Event
Music_Control	0x04	Reserved, Action	

#### Description:

This command is used to trigger AVRCP commands for music control.

#### Precondition:

AVRCP should be active. If not, BTM will initiate the AVRCP connection if A2DP is active and no voice call in progress.

#### Command Parameters:

*Reserved:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

*Action:* *Length: 1 Byte*

Value	Parameter Description
0x00	Stop Fast Forward or Rewind



## Audio UART Command Set

0x01	Fast Forward
0x02	Fast Forward With Repeat, Send Fast Forward Command For Every 812.5ms
0x03	Rewind
0x04	Rewind With Repeat, Send Rewind Command For Every 812.5ms
0x05	Play Command
0x06	Pause Command
0x07	Play Pause Toggle
0x08	Stop Command
0x09	Next song
0x0A	Previous song

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No AVRCP connection exist
0x03	Parameter error	Incorrect Action value

[\[Return to Command Table\]](#)

### 5.2.5 Change\_Device\_Name (0x05)

Command	Op Code	Command Parameters	Return Event
Change_Device_Name	0x05	BT_Device_Name	

#### Description:

This command is used to change the device name of BTM. The length should be shorter than 32 bytes. This change will be applied on

1. LMP response of name request from remote device.
2. EIR for inquiry response.

Note: This command does not update the device name in the NVM storage. The new name will not be effective after a power cycle.

There is another local device name setting in configuration data which could be read by command 0x10 Read\_Local\_Device\_Name and reply in event 0x21 Read\_Local\_Device\_Name\_Reply. To change local device name, use command 0x35 [Configuration Vendor Parameter](#) with op code 0x00.

The local device name could be used in

1. LMP response of name request from remote device
2. EIR for inquiry response
3. BLE advertising data and scan response data.

## Audio UART Command Set

### Precondition:

None.

### Command Parameters:

*BT\_Device\_Name:*

*Length: 32*

*Bytes*

Value	Parameter Description
0xXXXX	Bluetooth device name

[\[Return to Command Table\]](#)

### 5.2.6 Change\_PIN\_Code (0x06)

Command	Op Code	Command Parameters	Return Event
Change_PIN_Code	0x06	PIN Code	

### Description:

This command is used to change the BT PIN code of BTM used. Host MCU shall assert this command before BTM into pairing mode. The new PIN code will be store in NVM storage.

### Precondition:

None.

### Command Parameters:

*PIN Code:*

*Length: 4 Octets*

Value	Parameter Description
0xXXXX	4 digits number by ASCII format.

[\[Return to Command Table\]](#)

### 5.2.7 BTM\_Parameter\_Setting (0x07)

Command	Op Code	Command Parameters	Return Event
BTM_Parameter_Setting	0x07	Parameter, Value1, Value2...	

### Description:

This command is used to set the specific parameters that are listed in the below table of BTM.

### Precondition:

None

### Command Parameters:

# Audio UART Command Set

Parameter:

Length: 1

Byte

Value	Parameter Description
0x00	To Set Pairing Timeout Value
0x01	To Set Supported A2DP Codec Type(This change will stored in device)
0x02	To Enable/Disable BTM Standby Mode (This change will update the e2prom)
0x03	To Set The Recharging Battery Capacity Threshold
0x04	To Set Supported BT Classic Profile
0x05	Set SBC bitpool setting : this should be set before A2DP connection established
0x06	Setting iAP2 serial number (This change will stored in device)
Others	Reserved

Default the settings won't update to EEPROM.

Value1 for Parameter 0x00:

Length: 1 Byte

Value	Parameter Description
0x00	Pairing Timeout Disabled
0xXX	Pairing Timeout Value in the unit of 30.08secs.

Value1 for Parameter 0x01:

Length: 1 Byte

Value	Parameter Description
Bit 1	Bit Mask: should be set to 1 for Enabling AAC
Bit 2	should be set to 1 for Enabling Vendor Specific Codec (LDAC, please note that it will not take effect if enable this bit on "no LDAC supported" IC) By default SBC codec is enabled

Value1 for Parameter 0x02:

Length: 1 Byte

Value	Parameter Description
0x00	To Disable BTM Standby Mode
0x01	To Enable BTM Standby Mode

Value1 for Parameter 0x03:

Length: 1 Byte

Value	Parameter Description
0xXX	Range in 0~100 and Unit In Percentage

Value1 for Parameter 0x04:

Length: 1 Byte

Value	Parameter Description (Bit Mask: Set to 1 to enable)
Bit 0	HSP
Bit 1	HFP
Bit 2	A2DP
Bit 3	AVRCP CT

## Audio UART Command Set

Bit 4	AVRCP TG
Bit 5	SPP
Bit 6	iAP
Bit 7	PBAP

*Value1 for Parameter 0x05:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Maximal bitpool setting Range : 0~250

*Value2 for Parameter 0x05:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Minimal bitpool setting Range : 0~250

*Value1 for Parameter 0x06:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	iAP2 serial number Length Max Length: 16

*Value2-N for Parameter 0x06:*

*Length: (N-2) Bytes*

Value	Parameter Description
xxxx	iAP2 serial number (ASCII string)

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect Parameter value Parameter 0x03: check battery setting range Parameter 0x05: check bit-pool range

[\[Return to Command Table\]](#)

### 5.2.8 Read\_BT\_M\_Version (0x08)

Command	Op Code	Command Parameters	Return Event
Read_BT_M_Version	0x08	Type	<a href="#">Read_BT_M_Version_Reply</a>

#### Description:

This command is used to query the supported UART command set version, FW version of BTM or DSP version.

#### Precondition:

None.

#### Command Parameters:

# Audio UART Command Set

Type:

Length: 1 Byte

Value	Parameter Description
0x00	To Query Supported UART Command Set Version
0x01	To Query BTM FW Version
0x02 ★	To Query EEPROM Version
0x03 ★	To Query BTM FW Detail Version
0x04 ★	To Query DSP Version
0x05 ★	To Query Project Target Version
0x06~0xFF	Reserved

★Please check the Exception Notice in "AudioUartCommandSet\_Summary\_Table\_v2.x.xlsx"

[\[Return to Command Table\]](#)

## 5.2.9 Vendor\_AT\_Cmd (0x0A)

Command	Op Code	Command Parameters	Return Event
Vendor_AT_Cmd	0x0A	Data_Base_Index,Cmd_Payload	<a href="#">Report_Vendor_AT_Event</a>

### Description:

This command is used to send any vendor specific AT command.

### Precondition:

HF should be in connected state and MCU need to receive 0x1D Report\_Vendor\_AT\_Event before next vendor specific AT command could be sent.

### Command Parameters:

Data\_Base\_Index:

Length: 1 Byte

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

Cmd\_Payload:

Length: N

Bytes

Value	Parameter Description
0xFFFF..	The AT command ASCII string excluding the "AT". For example : If MCU want to send "AT+ABCDE", the command payload should be "+ABCDE"

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	1. No HF connection exist 2. Vendor specific AT command in progress

# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.10 AVC\_Vendor\_Dependent\_Cmd (0x0B)

Command	Op Code	Command Parameters	Return Event
AVC_Vendor_Dependent_Cmd	0x0B	Data_Base_Index, Avc_Cmd_Payload	<a href="#">AVC_Vendor_Dependent_Response</a>

### Description:

This command is used to send vendor dependent AVC type commands which specific in AVRCP specification. Only single packet type is supported for this command. Refer the Avc\_Cmd\_Payload table given below for the supported PDU IDs. The detail format and setting needs to refer to AVRCP Specification [\[4\]\[5\]](#)

### Precondition:

AVRCP should be active.

### Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Avc\_Cmd\_Payload:* *Length: N Bytes*

Value	Parameter Description
Byte 0	AVRCP1.3 AVC Vendor Dependent Command PDU ID
0x10	Get Capabilities
0x11	List Player Application Setting Attributes
0x12	List Player Application Setting Values
0x13	Get Current Player Application Setting Value
0x14	Set Player Application Setting Value
0x15	Get Player Application Setting Attribute Text
0x16	Get Player Application Setting Value Text
0x17	Inform Displayable Character Set
0x18	Inform Battery Status Of CT
0x20	Get Element Attributes
0x30	Get Play Status
0x31	Register Notification
0x40	Request Continuing Response
0x41	Abort Continuing Response
Byte 1	0x00
Byte 2-3	Parameter Length
Byte 4-N	Parameter

# Audio UART Command Set

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No AVRCP connection

[\[Return to Command Table\]](#)

## 5.2.11 AVC\_Group\_Navigation (0x0C)

Command	Op Code	Command Parameters	Return Event
AVC_Group_Navigation	0x0C	Data_Base_Index, Navigation_Type	

### Description:

The basic group navigation commands have a similar behavior as the Forward and Backward commands, but instead of navigating to the next/previous song they are used to navigate to the first song in the next/previous group. Detail setting needs to refer to AVRCP Specification [\[4\]](#)

This command is not supported in MSPK2 and Audio Transceiver, please reference “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx

### Precondition:

AVRCP should be active.

### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Navigation\_Type:*

*Length: N*

*Bytes*

Value	Parameter Description
0x00	Next Group This function is used to move to the first song in the next group.
0x01	Previous Group This function is used to move to the first song in the previous group.

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No AVRCP connection

## Audio UART Command Set

[\[Return to Command Table\]](#)

### 5.2.12 Read\_Link\_Status (0x0D)

Command	Op Code	Command Parameters	Return Event
Read_Link_Status	0x0D	Reserved	<a href="#">Read_Link_Status_Reply</a>

#### Description:

This command is used to query the device state, profile link status, playback status and streaming status. Refer the Read\_Link\_Status\_Reply event for the detailed information.

#### Precondition:

None.

#### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

### 5.2.13 Read\_Paired\_Device\_Record (0x0E)

Command	Op Code	Command Parameters	Return Event
Read_Paired_Device_Record	0x0E	Reserved	<a href="#">Read_Paired_Device_Record_Reply</a>

#### Description:

This command is used to read the BT classic paired device information from BTM. The information will includes ~~have~~-link priority and BD address of the paired devices.

About link priority, 1 is the highest (newest device) and the lowest (oldest device) is depending on how many paired devices supported in this product. For example, MSPK2's lowest priority is 8 because it supports 8 paired devices.

#### Precondition:

None.

#### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved



# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.14 Read\_Local\_BD\_Address (0x0F)

Command	Op Code	Command Parameters	Return Event
Read_Local_BD_Address	0x0F	Reserved	<a href="#">Read_Local_BD_Address_Reply</a>

### Description:

This command is used to read the local BD address.

### Precondition:

None.

### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

[\[Return to Command Table\]](#)

## 5.2.15 Read\_Local\_Device\_Name (0x10)

Command	Op Code	Command Parameters	Return Event
Read_Local_Device_Name	0x10	Reserved	<a href="#">Read_Local_Device_Name_Reply</a>

### Description:

This command is used to read the local device name from configuration data. To change local device name, use command 0x35 [Configuration\\_Vendor\\_Parameter](#) with op code 0x00. The local device name could be used in

1. LMP response of name request from remote device
2. EIR for inquiry response
3. BLE advertising data and scan response data.

### Precondition:

None.

### Command Parameters:

## Audio UART Command Set

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

### 5.2.16 Send\_SPP/iAP\_Or\_LE\_Data (0x12)

Command	Op Code	Command Parameters	Return Event
Send_SPP/iAP_Or_LE_Data	0x12	Channel_Index,Type,Total_Length, Payload_Length,Payload	

#### Description:

This command is used to send the SPP/iAP or LE data to remote BT devices.

#### Precondition:

SPP/iAP should be in connected state or

LE transparent service should be active.

#### Command Parameters:

*CHANNEL\_INDEX:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	MCU receives channel index information while SPP connected is established. If the connection is iAP or iAP2, MCU will receives the correct channel index when Report_iAP_Info is received because iAP session is created until that time.  bit0~1: bluetooth connection index(data base index). Range from 0~3. bit 2: LE connection indicator bit3~5: rfcomm index. Range from 0 ~ 7. bit6~7: iAP session index. 1 is 1st session and 2 is 2nc session. 0 means not a iAP / iAP2 connection

*Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Single Packet
0x01	Fragmented Start Packet
0x02	Fragmented Continue Packet
0x03	Fragmented End Packet

# Audio UART Command Set

*Total\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Total Payload Length

*Payload\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Payload Length In This Packet

*Payload:*

*Length: N*

*Bytes*

Value	Parameter Description
0xFFFF	The Payload In This Packet

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	1. No SPP connection 2. BLE Transparent Service disable
0x03	Parameter error	Incorrect parameter
0x04	BTM busy	BTM is busy
0x05	BTM Memory Full	TX buffer is full, host MCU must resend the same data after receiving the ACK with 0x00.

[\[Return to Command Table\]](#)

## 5.2.17 BTM\_Utility\_Function (0x13)

Command	Op Code	Command Parameters	Return Event
BTM_Utility_Function	0x13	Utility_Function_Type,Parameter	

### Description:

This command is used to indicate BTM to execute the specific utility function. Supported functions list in below table, but due to not all products support all functions, please read “BTM\_Utility\_Function” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

### Precondition:

None.

### Command Parameters:

*Utility\_Function\_Type:*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0x00	Host MCU ask BTM to process NFC detected function.
0x01	To Enable/Disable in-built Aux Line In Function If in-built Aux Line In Function is enabled then once line in is detected , BTM will process built-in aux line-in detection procedure
0x02	To generate one-shot specific tone
0x03	To make BTM-on-discoverable and non-connectable or active
0x04	To indicate charger adaptor status
0x05★	To indicate BTM that remote device supports TTS engine. The BTM shall disable internal TTS engine.
0x06	To update partial EEPROM data which are related to part of audio configuration.
0x07	Voice prompt for the given version number.
0x08	For MSPK, MCU notifies the BTM current power condition
0x09	To update vendor EEPROM data
0x0A	For MSPK, To inform Central that certain status has been changed in Peripheral side
0x0B	To Read Serial number. For this command, MCU will receive event Report_Vendor_EEPROM_Data with report data 16 bytes.
0x0C★	To switch audio channel
0x0D★	Customized MCU report : MCU Report specified information the following parameter
0x0E★	Customized MCU request: MCU request specified information by the following parameter. BTM replies the specified information by E3E
0x0F	To enable MIC loopback as Line-in

★ Please read “BTM\_Utility\_Function” sheet in  
AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

*Parameter for Utility\_Function\_Type 0x00:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

### Function description:

This function is used for MCU to ask BTM to process “NFC detected” function.

If BTM is under OFF state, BTM will power on.

If BTM is under PAIRING state, BTM will enter STANDBY state.

If BTM is under other state, BTM will enter PAGE SCAN ENABLE state.

## Audio UART Command Set

Parameter for Utility\_Function\_Type 0x01:

Length: 1

Byte

Value	Parameter Description
0x00	Line in is not controlled by MCU
0x01	Line in is controlled by MCU

Parameter for Utility\_Function\_Type 0x02:

Length: 1

Byte

Value	Parameter Description
0xXX	Tone Type

Tone Type:

Length: 1 Byte

Value	Parameter Description	Sub Parameter
0x00	N/A	0
0x01	200Hz	100msec
0x02	500Hz	100msec
0x03	1KHz	100msec
0x04	1.5KHz	100msec
0x05	2KHz	100msec
0x06	200Hz	500msec
0x07	500Hz	500msec
0x08	1KHz	500msec
0x09	1.5KHz	500msec
0x0A	2KHz	500msec
0x0B	200Hz / mute / 200Hz	100msec for each tone
0x0C	500Hz / mute / 500Hz	100msec for each tone
0x0D	1KHz / mute / 1KHz	100msec for each tone
0x0E	1.5KHz / mute / 1.5KHz	100msec for each tone
0x0F	2KHz / mute / 2KHz	100msec for each tone
0x10	200Hz / mute / 200Hz / mute / 200Hz	100msec for each tone
0x11	500Hz / mute / 500Hz / mute / 500Hz	100msec for each tone
0x12	1KHz / mute / 1KHz / mute / 1KHz	100msec for each tone
0x13	1.5KHz / mute / 1.5KHz / mute / 1.5KHz	100msec for each tone
0x14	2KHz / mute / 2KHz / mute / 2KHz	100msec for each tone
0x15	200Hz / mute / 200Hz / mute / 200Hz mute / / 200Hz	100msec for each tone
0x16	500Hz / mute / 500Hz / mute / 500Hz / mute / 500Hz	100msec for each tone
0x17	1KHz / mute / 1KHz / mute / 1KHz / mute / 1KHz	100msec for each tone
0x18	1.5KHz / mute / 1.5KHz / mute / 1.5KHz / mute / 1.5KHz	100msec for each tone
0x19	2KHz / mute / 2KHz / mute / 2KHz / mute / 2KHz	100msec for each tone
0x1A	500Hz / 400Hz / 300Hz / 200Hz	50msec for each tone
0x1B	200Hz / 300Hz / 400Hz / 500Hz	50msec for each tone
0x1C	400Hz / 300Hz	150msec for each tone
0x1D	300Hz / 400Hz	150msec for each tone

## Audio UART Command Set

0x1E	300Hz / mute / 400Hz / mute / 500Hz / mute / 1000Hz	100msec for each tone
0x1F	1000Hz / mute / 500Hz / mute / 400Hz / mute / 300Hz	100msec for each tone
0x20	ROM build-in multi tone melody	
0x21	ROM build-in multi tone melody	
0x22	ROM build-in multi tone melody	
0x23	ROM build-in multi tone melody	
0x24	ROM build-in multi tone melody	
0x25	ROM build-in multi tone melody	
0x26	ROM build-in multi tone melody	

### Stored Voice prompt

Tone_type	Voice prompt description
0x80	VP_POWER_ON
0x81	VP_POWER_OFF
0x82	VP_PAIRING_MODE
0x83	VP_PAIRING_COMPLETE
0x84	VP_PAIRING_NOT_COMPLETE
0x85	VP_CONNECTED
0x86	VP_DISCONNECTED
0x87	VP_INCOMING_CALL
0x88	VP_REJECT_CALL
0x89	VP_CALL_END
0x8A	VP_VOICE_DIAL
0x8B	VP_REDIAL
0x8C	VP_BATTERY_L
0x8D	VP_BATTERY_M
0x8E	VP_BATTERY_H
0x8F	VP_CHARGING_START
0x90	VP_CHARGING_OK
0x91	VP_MAX_VOL
0x92	VP_MIN_VOL
0x93	VP_TONE_SET

Parameter for Utility\_Function\_Type 0x03:

Length: 1

Byte

Value	Parameter Description
0x00	To force BTM into non-connectable mode
0x01	To resume BTM to normal mode

# Audio UART Command Set

Parameter for Utility\_Function\_Type 0x04:

Length: 1

Byte

Value	Parameter Description
0x00	Adaptor plugged in
0x01	Adaptor unplugged
0x02★	USB plugged in
0x03★	USB unplugged

★ Please check the Exception Notice sheet in "AudioUartCommandSet\_Summary\_Table\_v2.x.xlsx".

Parameter for Utility\_Function\_Type 0x05:

Length: 1

Byte

Value	Parameter Description
0x01	To indicate BTM that remote device supported TTS engine. The BTM shall disable internal TTS engine.
Others	Reserved

Parameter for Utility\_Function\_Type 0x06:

Length: 1

Byte

Value	Parameter Description
0xXX	Reserved

Parameter for Utility\_Function\_Type 0x07:

Value	Parameter Description
parameter[0]	Version length. Ex: v1.05 length is 3
parameter[1~length]	Version value. Ex: v1.05 value is 1 0 5

Parameter for Utility\_Function\_Type 0x08:

Length: 1

Byte

Value	Parameter Description
0x00	Battery power with Low battery
0x01	Adaptor power with Low battery
0x02	Battery power
0x03	Adaptor power

Parameter for Utility\_Function\_Type 0x09:

Value	Parameter Description
parameter[0]	Vendor EEPROM offset
parameter[1]	Update length
parameter[2~length+1]	Update data

## Audio UART Command Set

Parameter for Utility\_Function\_Type 0x0A:

Length: 1

Byte

Value	Parameter Description
0xXX	Reserved

Parameter for Utility\_Function\_Type 0x0B:

Length: 1

Byte

Value	Parameter Description
0xXX	Reserved

Parameter for Utility\_Function\_Type 0x0C:

Length: 1

Byte

Value	Parameter Description
0x00	L+R
0x01	L+L
0x02	R+R
0x03	(L+R)/2

Parameter for Utility\_Function\_Type 0x0D Customized MCU

report :

parameter

SIZE: 2 BYTE

	Parameter Description
0x00 00	MCU Power State is OFF
0x00 01	MCU Power State is ON
0x01 00	MCU Exit Demo Mode
0x01 01	MCU Enter Demo Mode
Others	Reserved

Parameter for Utility\_Function\_Type 0x0E Customized MCU request :

parameter

SIZE: 1 BYTE

	Parameter Description
0x00	Inquiry Unique ID
0x01	Inquiry Remote BT address
0x02	Inquiry BLE Tx power
Otehrs	Reserved



# Audio UART Command Set

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Parameter incorrect

*Parameter for Utility\_Function\_Type 0x0F:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Disable MIC loopback as Line-in
0x01	Enable MIC loopback as Line-in

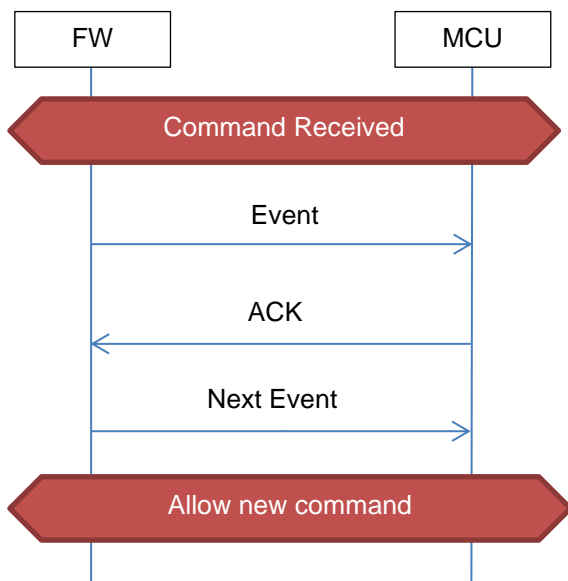
[\[Return to Command Table\]](#)

## 5.2.18 Event\_Ack (0x14)

Command	Op Code	Command Parameters	Return Event
Event_Ack	0x14	Event_ID	

### Description:

This command is used for MCU to acknowledge the received BTM event.



### Precondition:

None.

### Command Parameters:

## Audio UART Command Set

<i>Event_ID</i>		<i>Length: 1 Byte</i>
Value	Parameter Description	
0xXX	Event ID of the event which needs to be acknowledged	

[\[Return to Command Table\]](#)

### 5.2.19 Additional\_Profile\_Link\_Setup (0x15)

Command	Op Code	Command Parameters	Return Event
Additional_Profile_Link_Setup	0x15	Data_Base_Index, Linked_Profile	

#### Description:

This command is used to initiate other BT Classic profile connection based on the already existing link profiles. For example, you can initiate HF/HS profile connection if HF/HS is under standby mode and without connection and there is already has one A2DP/AVRCP/SPP connected profile.

#### Precondition:

ACL link should be connected and

A2DP or AVRCP or HF or SPP profile should be connected.

#### Command Parameters:

<i>Data_Base_Index:</i>		<i>Length: 1 Byte</i>
Value	Parameter Description	
0x00	database Index 0 that linked profile occupied	
0x01	database Index 1 that linked profile occupied	

<i>Linked_Profile:</i>		<i>Length: 1 Byte</i>
Value	Parameter Description	
0x00	To Initiate HF/HS Profile connection	
0x01	To Initiate A2DP Profile connection	
0x02	To Initiate iAp/SPP Profile connection	

<i>Return error:</i>			<i>Length: 1 Byte</i>
Value	Description	Condition	
0x01	Command disallow	No ACL link or no any A2DP/AVRCP/HFP/HSP profile connected or the initiating profile is connected.	

# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.20 Read\_Linked\_Device\_Information (0x16)

Command	Op Code	Command Parameters	Return Event
Read_Linked_Device_Information	0x16	Data_Base_Index, Type	<a href="#">Read_Linked_Device_Information_Reply</a>

### Description:

This command is used to retrieve the connected device profile information or local information based on the 'Type' parameter value.

### Precondition:

For Type 0x00: ACL link should be connected

For Type 0x01: HF should be in connected state

For Type 0x02: SPP should be in connected state

For Type 0x03: AVRCP should be in connected state

For Type 0x04 and 0x05: None

For Type 0x06: A2DP should be in connected state.

### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Query remote device name
0x01	Query remote audio gateway's In-Band Ringtone Status
0x02	Query Whether remote device is iAP or standard SPP device
0x03	Query Whether remote device supports AVRCP 1.3 or not
0x04	Query HF/A2DP Gain
0x05	Query Line-In Gain
0x06	Query A2DP codec

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
-------	-------------	-----------

## Audio UART Command Set

0x01	Command disallow	Type 0x00: no ACL link Type 0x01: no HF connection Type 0x02: no SPP connection Type 0x03: no AVRCP connection
0x03	Parameter error	Incorrect parameter

[\[Return to Command Table\]](#)

### 5.2.21 Profiles\_Link\_Back (0x17)

Command	Op Code	Command Parameters	Return Event
Profile_Link_Back	0x17	Type, Device_Index, Profile, BT_Addr	<a href="#">Report_Link_Back_Status</a>

#### Description:

This command is used to trigger the link for specific profiles to the devices in paired list.

#### Precondition:

Paired device list should exist.

#### Command Parameters:

Type:

Length: 1 Byte

Value	Parameter Description	Sub Parameter
0x00	Connect to last device : Create profile connection to last device according its profile support record, includes HF/HS and A2DP.	NA
0x01	Initiate HF/HS connection to last HF/HS device	NA
0x02	Initiate A2DP connection to last A2DP device	NA
0x03	Initiate SPP/iAP connection to last SPP/iAP device	NA
0x04	Initiate connection to dedicate device index with the profile specified by the Profile parameter	Device_Index, Profile
0x05	Initiate connection to the specified BT Address	Device_Index, Profile, BT_Addr
0x06	Deprecated	NA
0x07★	Initiate connection to unpaired device	Profile, BT_Addr

★ Please check the “Exception Notice” sheet in “AudioUartCommandSet\_Summary\_Table\_v2.x.xlsx”.

Device\_Index:

Length: 1 Byte

Value	Parameter Description
0x00	Device Index. Range is from 0 to 7

Profile:

Length: 1 Byte

## Audio UART Command Set

Value	Parameter Description
0x00	The profile determined by BTM's e2prom record.
Bit0	HS profile.
Bit1	HF profile.
Bit2	A2DP profile

*BT\_Addr:*

*Length:6*

*Bytes*

Value	Parameter Description
0XXXXXXXXXXXX	The Bluetooth address of the target device that BTM will trying to create a connection with

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	MSPK is creating connection TYPE=0x01: The last device doesn't support HF/HS/A2DP Incorrect TYPE

[\[Return to Command Table\]](#)

### 5.2.22 Disconnect (0x18)

Command	Op Code	Command Parameters	Return Event
Disconnect	0x18	Disconnection_Flag	<a href="#">BTM_Status</a>

#### Description:

This command is used to cancel the ongoing link back procedure or disconnect all the select linked profiles. BTM will disconnect ACL link if all of the profiles are disconnected.

#### Precondition:

None.

#### Command Parameters:

*Disconnection\_Flag: (ODM Project)*

*Length: 1 Byte*

Value	Parameter Description
Bit 0	Cancel page before ACL connection has been created.
Bit 1	Disconnect all of the HF connections
Bit 2	Disconnect all of the A2DP connections
Bit 3	Disconnect all of the SPP connections
Bit 4	Disconnect all of the BLE connections

*Disconnection\_Flag: (Other Projects)*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
Bit 0	Cancel page before ACL connection has been created.
Bit 1	Disconnect all of the HF connections
Bit 2	Disconnect all of the A2DP connections
Bit 3	Disconnect all of the SPP/iAP and BLE (if BLE enable) connections
Bit 4	Disconnect all of the SPP/iAP connections
Bit 5	Disconnect BLE connection

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect disconnection_flag parameter

[\[Return to Command Table\]](#)

### 5.2.23 User\_Confirm\_SSP\_Req\_Reply (0x1A)

Command	Op Code	Command Parameters	Return Event
User_Confirm_SSP_Req_Reply	0x1A	Data_Base_Index, User_Response	

#### Description:

This command is used to reply to a User\_Confirm\_SSP\_Req event and indicates that the user selected "yes" or "no".

This command is not supported by MSPKv2, IS2066 WST and Audio Transceiver, etc. Please reference to "Command" sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

ACL link should be connected.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 that simple pairing is ongoing
0x01	database 1 that simple pairing is ongoing

*User\_Response:*

*Length: 1 Byte*

Value	Parameter Description
0x00	User Selected "yes"
0x01	User Selected "no"

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No ACL connection

# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.24 Set\_HF\_Speaker\_Gain\_Level (0x1B)

Command	Op Code	Command Parameters	Return Event
Set_HF_Speaker_Gain_Level	0x1B	Data_Base_Index, Gain_Level	

### Description:

This command is used to set HF Speaker gain of BTM.

### Precondition:

HF should be in connected state.

### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 that related to a dedicate HF device
0x01	database 1 that related to a dedicate HF device

*Gain\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0x00 – 0x0F	HF Speaker Gain Level

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No HF connection

[\[Return to Command Table\]](#)

## 5.2.25 EQ\_Mode\_Setting (0x1C)

Command	Op Code	Command Parameters	Return Event
EQ_Mode_Setting	0x1C	EQ_Mode, Reserved	<a href="#">EQ_Mode_Indication</a>

### Description:

This command is used to set the EQ mode of BTM for audio playback.

### Precondition:

EQ Mode should be enabled by using configuration tool.

### Command Parameters:

## Audio UART Command Set

*EQ\_Mode:*

*Length: 1 Byte*

Value	Parameter Description
0x00	EQ_MODE_OFF
0x01	EQ_MODE_SOFT
0x02	EQ_MODE_BASS
0x03	EQ_MODE_TREBLE
0x04	EQ_MODE_CLASSICAL
0x05	EQ_MODE_ROCK
0x06	EQ_MODE_JAZZ
0x07	EQ_MODE_POP
0x08	EQ_MODE_DANCE
0x09	EQ_MODE_RNB
0x0A	EQ_MODE_USER1
Others	Reserved

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	DSP EQ mode not enable

[\[Return to Command Table\]](#)

### 5.2.26 DSP\_NR\_CTRL (0x1D)

Command	Op Code	Command Parameters	Return Event
DSP_NR_CTRL	0x1D	Cmd_Type	

#### Description:

This command is used to set the noise reduction for voice link.

#### Precondition:

None.

#### Command Parameters:

*Cmd\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x18	ENABLE_Mic_NR
0x19	DISABLE_Mic_NR
0x1B	ENABLE_SPK_NR



## Audio UART Command Set

0x1C	DISABLE_SPK_NR
Others	Reserved

Return error:

Length: 1 Byte

### V1.03

Value	Description	Condition
0x01	Command disallow	DSP NR module disable
0x03	Parameter error	Parameter incorrect

[\[Return to Command Table\]](#)

### 5.2.27 GPIO\_Control (0x1E)

Command	Op Code	Command Parameters	Return Event
GPIO_CTRL	0x1E	IO_Ctrl_Mask_P0, IO_Ctrl_Mask_P1, IO_Ctrl_Mask_P2, IO_Ctrl_Mask_P3, IO_Setting_P0, IO_Setting_P1, IO_Setting_P2, IO_Setting_P3, Output_Value_P0, Output_Value_P1, Output_Value_P2, Output_Value_P3,	<a href="#">Report_Input_Signal_Level</a>

#### Description:

This command is used to control the specific GPIOs as input level detection or output level drive. For input level detection configuration, BTM will report the input signal level to MCU when input signal level is changed. Please note that when the pin is used as GPIO, it cannot go back to the previous MFIO state (eg: I2C).

Note: For GPIOs configured as input, Report\_Input\_Signal\_Level event shall be send under two condition, first condition is when BTM receive input setting command, the second condition is when input GPIO input signal level is changed

#### Precondition:

None.

#### Command Parameters:

IO\_CTRL\_MASK\_P0:

Length: 1 Byte

Value	Parameter Description
0bXXXXXXXX	Bit mask of P0 for IO control setting. MCU set the bit value to 0 to control corresponding pin, otherwise set to 1.

## Audio UART Command Set

Bit 0: P0\_0 IO control setting mask.  
Bit 1: P0\_1 IO control setting mask.  
.....

*IO\_CTRL\_MASK\_P1:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P1 for IO control setting. MCU set the bit value to 0 to control corresponding pin, otherwise set to 1. Bit 0: P1_0 IO control setting mask. Bit 1: P1_1 IO control setting mask. .....

*IO\_CTRL\_MASK\_P2:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P2 for IO control setting. MCU set the bit value to 0 to control corresponding pin, otherwise set to 1. Bit 0: P2_0 IO control setting mask. Bit 1: P2_1 IO control setting mask. .....

*IO\_CTRL\_MASK\_P3:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P3 for IO control setting. MCU set the bit value to 0 to control corresponding pin, otherwise set to 1. Bit 0: P3_0 IO control setting mask. Bit 1: P3_1 IO control setting mask. .....

*IO\_SETTING\_P0:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Setting P0 GPIO as input or output mode IO bit setting of P0 for input or output configuration. 0: input. 1: output Bit 0: P0_0 IO control setting. Bit 1: P0_1 IO control setting. .....

*IO\_SETTING\_P1:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Setting P1 GPIO as input or output mode IO bit setting of P1 for input or output configuration. 0: input. 1: output

## Audio UART Command Set

Bit 0: P1\_0 IO control setting.  
Bit 1: P1\_1 IO control setting.  
.....

*IO\_SETTING\_P2:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Setting P2 GPIO as input or output mode IO bit setting of P2 for input or output configuration. 0: input. 1: output Bit 0: P2_0 IO control setting. Bit 1: P2_1 IO control setting. .....

*IO\_SETTING\_P3:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Setting P3 GPIO as input or output mode IO bit setting of P3 for input or output configuration. 0: input. 1: output Bit 0: P3_0 IO control setting. Bit 1: P3_1 IO control setting. .....

*OUTPUT\_VALUE\_P0:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Output level of P0.x GPIOs setting. It is used for IO_Setting_P0.x as output only.

*OUTPUT\_VALUE\_P1:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Output level of P1.x GPIOs setting. It is used for IO_Setting_P1.x as output only.

*OUTPUT\_VALUE\_P2:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Output level of P2.x GPIOs setting. It is used for IO_Setting_P2.x as output only.

*OUTPUT\_VALUE\_P3:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Output level of P3.x GPIOs setting. It is used for IO_Setting_P3.x as output only.

[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.28 MCU\_UART\_Rx\_Buffer\_Size (0x1F)

Command	Op Code	Command Parameters	Return Event
MCU_UART_Rx_Buffer_Size	0x1F	Max_MCU_UART_Rx_Buffer_Size	

#### Description:

This command is used to indicate the BTM about the max UART Rx buffer size. The default value is 256 Bytes. The minimum Rx buffer size of MSPK2 is 0x0F.

#### Precondition:

None.

#### Command Parameters:

*Max\_MCU\_UART\_Rx\_Buffer\_Size:*

*Length: 2 Bytes*

Value	Parameter Description
0xXXXX	The maximum UART receiver buffer size of Host MCU.

[\[Return to Command Table\]](#)

### 5.2.29 Voice\_Prompt\_Cmd (0x20)

Command	Op Code	Command Parameters	Return Event
Voice_Prompt_Cmd	0x20	Cmd_Type, Parameter, Voice_Data	<a href="#">Report_Voice_Prompt_Status</a>

#### Description:

This command is used to control BTM voice prompt function. Host MCU shall set voice prompt control parameter first and then send voice prompt data after received the event Report\_Voice\_Prompt\_Status with ready status.

#### Precondition:

For Cmd\_Type 0x00: None

For Cmd\_Type 0x01: Voice\_Prompt\_Cmd(0x20) should be called with Cmd\_Type 0x00

For example:

(1) 0x20 0x00 0x01

(2) 0x20 0x01 0x00 "RAW data" which data size is smaller than 480 bytes

#### Command Parameters:

*Cmd\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Voice Prompt Settings
0x01	Voice Prompt Data

# Audio UART Command Set

Others	Reserved
--------	----------

*Parameter: for Cmd\_Type 0x00*

*Length: 1 Byte*

Value	Parameter Description
0x00	Stop to play voice prompt and skip the previous voice data.
0x01	initial, high priority: Force to stop current tone and clean tone queue then play the new tone
0x02	initial, low priority: just put the new tone into the tone queue
Others	reserved

*Parameter: for Cmd\_Type 0x01*

*Length: 1 Byte*

Value	Parameter Description
0x00	single packet, if voice data size is less than 480
0x01	fragmented start packet
0x02	fragmented continue packet
0x03	fragmented end packet
Others	reserved

*Voice\_Data: for Cmd\_Type 0x00*

*Length: N*

*Bytes*

Value	Parameter Description
0xFFFF	Invalid

*Voice\_Data: for Cmd\_Type 0x01*

*Length: N*

*Bytes*

Value	Parameter Description
0xFFFF	Voice Prompt Data

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	DSP Ringtone state is ready
0x04	BTM busy	BTM is busy
0x03	Parameter error	Parameter incorrect

[\[Return to Command Table\]](#)

## 5.2.30 Set\_Overall\_Gain (0x23)

Command	Op Code	Command Parameters	Return Event
---------	---------	--------------------	--------------

## Audio UART Command Set

Set_Overall_Gain	0x23	Data_Base_Index, Mask,Type,Gain1,Gain2,Gain3
------------------	------	-------------------------------------------------

### Description:

This command is used to set overall gain that includes hf, a2dp and line\_in.

### Precondition:

None.

### Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0
0x01	database 1

*Mask:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Set '1' to indicate the gain need to change. bit0:A2DP gain bit1:HF gain bit2:Line_In gain bit3:PCM gain bit4:Line_In input gain

*Type:* *Length: 1 Byte*

Value	Parameter Description
0x01	volume up
0x02	volume down
0x03	set absolute gain level
0x04	set absolution gain value (only for AVRCP1.5)
0x05	sync volume setting from MCU

*Gain1: Effective when bit0 of mask is 1 or type is 3, 4, 5* *Length: 1 Byte*

Value	Parameter Description
0xXX	type=1,2 X type=3 : A2DP gain level 0~15 0x00~0x0F type=4,5 : A2DP absolute gain value 0%~100% 0x00~0x7F

# Audio UART Command Set

Other types are reserved

Gain 2: Effective when bit1 of mask is 1 or type is 3, 5

Length: 1

Byte

Value	Parameter Description
0xXX	type=1,2,4 X type=3 : HF gain level 0~15 0x00~0x0F type=5 : HF gain percentage 0%~100% 0x00~0x7F Other types are reserved

Gain 3: Effective when bit2 of mask is 1 or type is 3, 5

Length: 1

Byte

Value	Parameter Description
0xXX	type=1,2,4 X type=3 : line in gain level 0~15 0x00~0x0F type=5 : line in gain percentage 0%~100% 0x00~0x7F Other types are reserved

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	Type 0x03: mask profiles aren't connected. Type 0x04: AVRCP is not connected.
0x03	Parameter error	Incorrect parameter: Gain value is bigger than max gain setting.

[\[Return to Command Table\]](#)

## 5.2.31 Read\_BT\_M Setting (0x24)

Command	Op Code	Command Parameters	Return Event
Read_BT_M Setting	0x24	Setting_Type, Reserved	<a href="#">REPORT_TYPE_BT_M_SETTING</a>

### Description:

This command is used to read setting status of BTM.

### Precondition:

## Audio UART Command Set

None.

### Command Parameters:

*Setting\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	read pairing timeout value
0x01	read supported codec type
0x02	read BTM Standby mode status
others	reserved

*Reserved:*

*Length: 1*

*Byte*

Value	Parameter Description
0xFF	Reserved

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect parameter

[\[Return to Command Table\]](#)

### 5.2.32 Read\_BT\_M\_Battery\_Charger\_Status (0x25)

Command	Op Code	Command Parameters	Return Event
Read_BT_M_Battery_Charger_Status	0x25	Type	<a href="#">BT_M_Battery_Status</a> <a href="#">BT_M_Charging_Status</a>

#### Description:

This command is used to read either Battery or Charger status of BTM.

#### Precondition:

None.

### Command Parameters:

*Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	To Read Battery Status
0x01	To Read Charger Status
Others	Reserved

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
-------	-------------	-----------



# Audio UART Command Set

0x03	Parameter error	Parameter incorrect.
------	-----------------	----------------------

[\[Return to Command Table\]](#)

## 5.2.33 MCU\_Update\_Cmd (0x26)

Command	Op Code	Command Parameters	Return Event
MCU_Update_Cmd	0x26	Action	

### Description:

This command is used to inform BTM about MCU boot loader status.

This command is not supported in MSPK2, IS2066 WST and Audio Transceiver, etc. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

### Precondition:

None.

### Command Parameters:

*Action:* *Length: 1 Byte*

Value	Parameter Description
0x00	Update start and report the total size
0x01	MCU ready to receive data from BTM
0x02	MCU update finish
Others	Reserved

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect parameter

[\[Return to Command Table\]](#)

## 5.2.34 Report\_Battery\_Capacity (0x27)

Command	Op Code	Command Parameters	Return Event
Report_Battery_Capacity	0x27	Capacity	

### Description:

This command is used to inform BTM about the system battery remaining level capacity (unit in percentage)

### Precondition:

None.

# Audio UART Command Set

## Command Parameters:

*Capacity:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Battery capacity, Range in 0~100 and Unit in percentage

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Parameter incorrect.

[\[Return to Command Table\]](#)

### 5.2.35 LE\_ANCS\_Service\_Cmd (0x28)

Command	Op Code	Command Parameters	Return Event
LE_ANCS_Service_Cmd	0x28	SubCommand_Type, SubCommand_Payload	

#### Description:

This command is used to access Apple Notification Center Service(ANCS), and get many kinds of notifications that are generated on iOS devices by Bluetooth low-energy link.

This command is not supported in MSPK2, IS2066 WST and Audio Transceiver, etc. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

LE should be in connected state.

## Command Parameters:

*SubCommand\_Type :* *Length: 1 Byte*

Value	Parameter Description
0x00	ANCS Search
0x01	ANCS Subscribe
0x02	ANCS GetNotification Attribute
0x03-0xFF	Reserved

*SubCommand\_Payload : for SubCommand\_Type 0x00* *Length: 0 Byte*

Value	Parameter Description
N/A	N/A

## Audio UART Command Set

*SubCommand\_Payload : for SubCommand\_Type 0x01*

*Length: 1 Byte*

Value	Parameter Description
0x00	Un-subscribe ANCS
0x01	Subscribe ANCS

*SubCommand\_Payload : for SubCommand\_Type 0x02*

*Length: N*

*Bytes*

Value	Parameter Description
	<a href="#">The format of a GetNotification Attribute command. [2]</a>

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No LE connection
0x03	Parameter error	For other than given SubCommand_Type
0x04	BTM busy	BTM is busy

[\[Return to Command Table\]](#)

### 5.2.36 LE\_Signaling\_Cmd (0x29)

Command	Op Code	Command Parameters	Return Event
LE_Signaling_Cmd	0x29	SubCommand_Type, SubCommand_Payload	<a href="#">LE_Signaling_Event</a> for SubCommand 0x00.

#### Description:

This command is used to do the Bluetooth low energy signaling control.

#### Precondition:

None.

#### Command Parameters:

*SubCommand\_Type :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Query LE status
0x01	LE Advertising Control
0x02	LE Connection Parameters Update REQ
0x03	LE Advertising Interval Update
0x04	LE Advertising Type
0x05	LE Advertising Data
0x06	LE Scan Response Data
0x07-0xFF	Reserved

*SubCommand\_Payload : for SubCommand\_Type 0x00*

*Length: 0 Byte*

Value	Parameter Description
-------	-----------------------

# Audio UART Command Set

N/A	N/A
-----	-----

*SubCommand\_Payload : for SubCommand\_Type 0x01* *Length: 1 Byte*

Value	Parameter Description
0x00	Disable Advertising
0x01	Enable Advertising

*SubCommand\_Payload : for SubCommand\_Type 0x02* *Length: 8 Bytes*

Value	Parameter Description
0xFFFF(2 Bytes)	Connection Interval Minimum: 0x0006 to 0x0C80 (7.5ms ~ 4s), Minimum value for the connection event interval.
0xFFFF(2 Bytes)	Connection Interval Maximum: 0x0006 to 0x0C80 (7.5ms ~ 4s), Maximum value for the connection event interval.
0xFFFF(2 Byte)	Peripheral Latency: Range: 0 to ((Supervision Timeout / (Connection Interval x2)) -1) and shall also be less than 500, The Peripheral Latency parameter defines the number of consecutive connection events that the Peripheral device is not required to listen for the Central.
0xFFFF(2 Bytes)	Supervision time out: Range: 0x000A to 0x0C80 (100ms ~ 32s), Supervision timeout for the LE Link

*SubCommand\_Payload : for SubCommand\_Type 0x03* *Length: 2 Bytes*

Value	Parameter Description
	Advertising interval. Range: 0x0020 ~ 0x4000. Unit: 0.625ms

*SubCommand\_Payload : for SubCommand\_Type 0x04* *Length: 1 Byte*

Value	Parameter Description
0x00	Connectable undirected advertising.
0x01	Reserved
0x02	Scannable undirected advertising
0x03	Non connectable undirected advertising.

*SubCommand\_Payload : for SubCommand\_Type 0x05* *Length: 1 ~ 32 Bytes*

Value	Parameter Description
	Reserved. (1 byte) Advertising data (max to 31 bytes).

# Audio UART Command Set

*SubCommand\_Payload : for SubCommand\_Type 0x06*

*Length: 1 ~ 32*

*Bytes*

Value	Parameter Description
	Reserved. (1 byte)
	Scan response data (max to 31 bytes).

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	For other than given SubCommand_Type
0x01	Command disallow	LE status incorrect

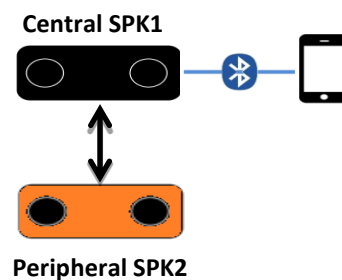
[\[Return to Command Table\]](#)

## 5.2.37 MSPK\_Vendor\_Cmd (0x2A)

Command	Op Code	Command Parameters	Return Event
MSPK_Vendor_Cmd	0x2A	SPK_Index, Parameter	

### Description:

This command is used to send the vendor MSPK command, after this command been sent to another SPKs, SPK may response OK, ERROR, or no response.



### Precondition:

None.

### Command Parameters:

*SPK\_Index : for SPK1*

*Length: 1 Byte*

Value	Parameter Description
Don't Care	Reserved, in Stereo mode, BTM

*Parameter: for SPK2*

*Length: 1 Byte*

SPK_Index	Parameter Content	Parameter Description
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## Audio UART Command Set

0x00	Invalid payload data	they are used to show the status of Peripheral SPK
0x01~0x1F	Valid payload data. This data will be transfer to SPK Central and SPK Central's MCU by E34	
0x20~0xFF	Invalid payload data.	

*Parameter: for SPK1*

For 9 bytes format (deprecated)	Parameter Content	Parameter Description
Byte[0]	High byte of following data	
Byte[1]	length, Low byte of following data length,	
Byte[2]~Byte[10]	Payload. 9 bytes are available	

For 11 bytes format	Parameter Content	Parameter Description
Byte[0]	High byte of following data	
Byte[1]	length, Low byte of following data length,	
Byte[2] ~Byte[12]	Payload. 11 bytes are available	

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	SPK_Inde 0x00: parameter incorrect.

[\[Return to Command Table\]](#)

### 5.2.38 Read\_MSPK\_Link\_Status (0x2B)

Command	Op Code	Command Parameters	Return Event
Read_MSPK_Link_Status	0x2B	Reserved	<a href="#">Report_MSPK_Link_Status</a>

#### Description:

This command is used to query the MSPK link status.

#### Precondition:

None.

#### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.39 MSPK\_Sync\_Audio\_Effect (0x2C)

Command	Op Code	Command Parameters	Return Event
MSPK_Sync_Audio_Effect	0x2C	audio_effect_type, audio_effect_value	

### Description:

It is used for Central SPK to sync audio effect to Peripheral SPK in MSPK mode.

### Precondition:

None.

### Command Parameters:

*audio\_effect\_type:* *Length: 1 Byte*

Value	Parameter Description
0xXX	vendor defined audio effect type

*audio\_effect\_value:* *Length: 1 Byte*

Value	Parameter Description
0xXX	audio effect value

[\[Return to Command Table\]](#)

## 5.2.40 LE\_GATT\_CMD (0x2D)

Command	Op Code	Command Parameters	Return Event
LE_GATT_CMD	0x2D	Sub_Cmd_Type, Parameters	

### Description:

Generic BLE GATT command for controlling MCU for specific GATT operations. This command is followed by sub commands for specific Gatt operations. The sub commands are detailed as below:

Note: This command is only supported in dual mode SPK 2.0 and dual mode SPK 2.1. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

### Precondition:

None.

## Audio UART Command Set

### 5.2.40.1 Send\_Characteristic\_Value (0x00)

This command is used to send characteristic value to GATT client. It can be used for both notification and indication of char value to Gatt client.

Command	Sub-Op Code	Command Parameters	Return Event
Send_Characteristic_Value	0x00	Connection_Handle, Characteristic_Value_Handle, Characteristic_Value	Status

#### Command Parameters:

*Connection\_Handle:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Characteristic\_Value\_Handle:*

*Length: 2 Bytes*

Value	Parameter Description
0xXX	Characteristic Value Handle

*Characteristic\_Value:*

*Length: 1 to 20 Bytes*

Value	Parameter Description
0xXX	Characteristic Value

### 5.2.40.2 Send\_Write\_Response (0x01)

This command is used to manually respond write request to the GATT client. FW will send "Write Response" with error code 0x00. Otherwise, "Error Response" with corresponding error code is sent. This command should only be sent after receiving write request.

Command	Sub-Op Code	Command Parameters	Return Event
Send_Write_Response	0x01	Connection_Handle, Request_Opcode, Attribute_Handle, Error_Code	Status

#### Command Parameters:

*Connection\_Handle:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Request\_Opcode:*

*Length: 1 Byte*

Value	Parameter Description



# Audio UART Command Set

0xXX	Write Request. The op-code of the request to respond.
------	-------------------------------------------------------

*Attribute\_Handle:*

*Length: 2*

*Bytes*

Value	Parameter Description
0xXX	The handle of the attribute which the request perform

*Error\_Code:*

*Length: 1 Byte*

Value	Parameter Description
0x00	No error. Send Write Response
0x01	Invalid Handle
0x02	Read Not Permitted
0x03	Write Not Permitted
0x04	Invalid PDU
0x05	Insufficient Authentication
0x06	Request Not Supported
0x07	Invalid Offset
0x08	Insufficient Authorization
0x09	Prepare Queue Full
0x0A	Attribute Not Found
0x0B	Attribute Not Long
0x0C	Insufficient Encryption Key Size
0x0D	Invalid Attribute Value Length
0x0E	Unlikely Error
0x0F	Insufficient Encryption
0x10	Unsupported Group Type
0x11	Insufficient Resources
0x12 – 0x7F	Reserved
0x80 – 0x9F	Application defined errors
0xA0 – 0xDF	Reserved
0xE0 – 0xFF	Common Profile and Service Error Codes

## 5.2.40.3 Update\_Characteristic\_Value (0x02)

This command is used to update existing characteristic value of local attribute database

Command	Sub-Op Code	Command Parameters	Return Event
Update_Characteristic_Value	0x02	Characteristic_Value_Handle, Characteristic_Value	Status

**Command Parameters:**

## Audio UART Command Set

*Characteristic\_Value\_Handle:*

*Length: 2 Byte*

Value	Parameter Description
0xXX	characteristic value handle

*Characteristic\_Value:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	characteristic value

### 5.2.40.4 Read\_Local\_Characteristic\_Value (0x03)

This command is used to read existing characteristic value from local attribute database.

Command	Sub-Op Code	Command Parameters	Return Event
Read_Local_Characteristic_Value	0x03	Characteristic_Value_Handle	Status Read_Local_Char_Value_Res

#### Command Parameters:

*Characteristic\_Value\_Handle:*

*Length: 2 Byte*

Value	Parameter Description
0xXX	characteristic value handle

### 5.2.40.5 Read\_Local\_All\_Primary\_Services (0x04)

This command is used to read all primary services from local attribute database.

Command	Sub-Op Code	Command Parameters	Return Event
Read_Local_All_Primary_Services	0x04	None	Status Discover_All_Primary_Services_Res

#### Command Parameters:

None.

### 5.2.40.6 Read\_Local\_Specific\_Primary\_Service (0x05)

This command is used to read specific primary service from local attribute database.

Command	Sub-Op Code	Command Parameters	Return Event
Read_Local_Specific_Primary_Service	0x05	Service_UUID	Status Read_Local_Specific_Primary_Service_Characteristic_Res

# Audio UART Command Set

Read\_Local\_All\_Char\_Descriptors\_Re  
s

## Command Parameters:

*Service\_UUID:*

*Length: 2/16*

*Byte*

Value	Parameter Description
0xXX	16-bit Bluetooth UUID or 128-bit UUID

**Note: UUID should be in reverse byte order. Eg.: If UUID is 0x180D, then send as 0x0D18**

### 5.2.41 LE\_App\_Cmd (0x2F)

Command	Op Code	Command Parameters	Return Event
LE_App_Cmd	0x2F	Sub_Cmd_Type, Parameter	

#### Description:

This command is used for LE application purpose.

Note: This command is only supported in dual mode SPK 2.0, dual mode SPK 2.1 and ODM project. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

For Sub\_Cmd\_Type 0x5D: LE state should be connected.

For Sub\_Cmd\_Type 0x5C: None

#### 5.2.41.1 Set\_Device\_Name (0x5C)

This command is used to set the LE device name.

Command	Sub-Op Code	Command Parameters	Return Event
Set_Device_Name	0x5C	Name_Length, Name_String	Status

## Command Parameters:

*Name\_Length:*

*Length: 1 Byte*

Value	Parameter Description
-------	-----------------------

## Audio UART Command Set

0xXX	Length of the LE device name
------	------------------------------

*Name\_String:*

*Length: 1 to 20*

*Bytes*

Value	Parameter Description
0xXX..	LE Device Name String

### 5.2.41.2 Get\_Att\_MTU\_Size (0x5D)

This command is used to get the Att MTU size. Att MTU size will be notified to the host MCU by using the event REPORT\_LE\_GATT\_EVENT (0x39) with the sub event type Get\_Att\_MTU\_Size\_Res (0x05).

Command	Sub-Op Code	Command Parameters	Return Event
Get_Att_MTU_Size	0x5D	None	Status, REPORT_LE_GATT_EVENT (0x39) with the sub-event type Get_Att_MTU_Size_Res (0x05)

#### Command Parameters:

None.

[\[Return to Command Table\]](#)

### 5.2.42 DSP\_Runtime\_Program (0x30)

Command	Op Code	Command Parameters	Return Event
DSP_Runtime_Program	0x30	Type, Cmd_Buffer	

#### Description:

This command is used to change the EQ parameter of the DSP in run time.

#### Precondition:

EQ Mode should be enabled by using DSP configuration tool for type 0x13.

#### Command Parameters:

*Type:*

*Length: 1 Byte*

Value	Parameter Description
0x13	To Set Audio EQ parameter
0x2D	To Set Sound Effect parameter

*Cmd Buffer: for Type 0x13*

*Length: 84*

# Audio UART Command Set

Bytes

Value	Parameter Description
0xXX	Audio EQ Parameter Following are just examples for SOFT, BASS and ROCK EQ parameter. It should be customized by using certain rule. //SOFT 00000000c039631500000000c051eb8540000007ffffff18b42aef45232a27000000 0000000000000000000000000000000000000000000000000000000000000000 0000000000000000000000000276e41b8 //BASS 36b0f0758a53021235a323fc8b5e7fa738b3d27e875cb8cf3a61d55085aef0ef3ed11 863812f30873f623e57809E0ae700000000000000000000000000000000000000 0000000000000000000000000409a1c9f //ROCK 2d35264093ba07232a70b4a7967869291997fe35b268d8f01ae7c4a9b1460ebb391 6b5b986f9e32239a05624867055943eb27d61814dcb773f5672b280a9d684e648e1 2c13247096fada28801d6d1440623817ec

Cmd Buffer: for Type 0x2D

Length: 7

Bytes

Value	Parameter Description
0xXX	Sound Effect Parameter Following is just an example for MBC table. It should be customized by using certain rule. //MBC table 4f914469dd0d00

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	For other than given Type and DSP Equalizer is not active

[\[Return to Command Table\]](#)

## 5.2.43 Read\_Vendor\_Stored\_Data (0x31)

Command	Op Code	Command Parameters	Return Event
Read_Vendor_Eeprom_Data	0x31	Offset ,Length	<a href="#">Report_Vendor_Stored_Data</a>

**Description:**

This command is used to read the vendor Stored data from NVM.

**Precondition:**

None.

# Audio UART Command Set

## Command Parameters:

*Offset:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Vendor EEPROM stored data Offset

*Length:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Read Length

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Data offset + Data_length is bigger than 32 (0x20)

[\[Return to Command Table\]](#)

### 5.2.44 Read\_IC\_Version\_Info (0x32)

Command	Op Code	Command Parameters	Return Event
Read_IC_Version_Info	0x32	Reserved	<a href="#">Report_IC_Ver_Info</a>

#### Description:

This command is used to read the IC version information.

#### Precondition:

None.

## Command Parameters:

*Reserved:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

### 5.2.45 Read\_BTMLink\_Mode (0x34)

Command	Op Code	Command Parameters	Return Event
Read_BTMLink_Mode	0x34	Reserved	<a href="#">Report_BTMLink_Mode</a>

#### Description:

This command is used to read the last link mode, it can be used to identify the mode before give the Porfile\_Link\_Back command.

#### Precondition:

# Audio UART Command Set

None.

## Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

## 5.2.46 Configure\_Vendor\_Parameter (0x35)

Command	Op Code	Command Parameters	Return Event
Configure_Vendor_Paramete r	0x35	Opcode, (Mandatory) Option, (Mandatory) Length, (Optional) Parameters (Optional)	

## Description:

This command is used to configure the vendor parameter.

## Precondition:

None.

## Command Parameters:

*Opcode:*

*Length: 1 Byte*

Value	Parameter Description
0x00	<b>Change Device Name:</b> The device name in NVM storage will be replaced by new device name parameter.
0x01	<b>Restore Default Device Name</b> Restore the device name as the default setting of UI parameter.
0x02	<b>Change MSPK Group ID</b> Replace the new MSPK Group ID by the new Group ID parameter.
Others	Reserved

*Option:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Reserved, Set it to 0x00

*Length:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Length of the following parameter

*Parameter:*

*Length: N Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	For Opcode 0x00: New device name parameter
	For Opcode 0x01: Reserved
	For Opcode 0x02: New MSPK Group ID

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Length is zero or bigger than 64 bytes when using Restore Device Name
0x03	Parameter error	1. Length is bigger than 23 bytes when using Change Device Name 2. OpCode incorrect 3. Length is bigger than 2 bytes when using MSPK Group ID

[\[Return to Command Table\]](#)

### 5.2.47 MSPK Exchange\_Link\_Info\_Cmd (0x37)

Command	Op Code	Command Parameters	Return Event
MSPK Exchange_Link_Info_Cmd	0x37	Exchange_data	

#### Description:

It is for information exchange when creating CSB link. This command must be sent before creating CSB link if it has data need to exchange. Event Report\_MSPK\_Exchange\_Link\_info (0x3D) is reported on the other peer when exchange information received. The detail exchange information format please reference [Report MSPK Exchange Link info \(0x3D\)](#).

#### Precondition:

None.

#### Command Parameters:

*Exchange\_data:*

*Length: 16 Byte*

Value	Parameter Description
0xXXXX...	16 bytes exchanged data.

[\[Return to Command Table\]](#)



## Audio UART Command Set

### 5.2.51 MSPK Set GIAC(0x38)

Command	Op Code	Command Parameters	Return Event
MSPK Set GIAC	0x38	GIAC	

#### Description:

This command is used for change the group code for CSB general pairing and the modification won't change the EEPROM setting.

#### Precondition:

None.

#### Command Parameters:

*GIAC:*

*Length: 2 Byte*

Value	Parameter Description
0XXXXX...	GIAC value

[\[Return to Command Table\]](#)

### 5.2.52 READ\_FEATURE\_LIST (0x39)

Command	Op Code	Command Parameters	Return Event
READ_FEATURE_LIST	0x39	Reserved	Report_Read_Feature_List_Reply

#### Description:

This command is used to query supported feature.

#### Precondition:

None.

#### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

### 5.2.53 Personal\_MSPK\_GROUP\_Control (0x3A)

Command	Op Code	Command Parameters	Return Event
Personal_MSPK_GROUP_Control	0x3A	Enable, Central_SPK_BD_ADDR	

# Audio UART Command Set

## Description:

This command is used to inform Peripheral\_SPK for Personal MSPK Group Setting enable or disable.

The Central\_SPK\_BD\_ADDR is Central\_SPK BT Device Address. Peripheral\_SPK will only accept the MSPK connection for specific Central\_SPK if Personal MSPK Group is enabled.

This command must be assert before MSPK Command triggered. For MSPK triggered, use MMI command with action ID = 0xE0 is doable.

## Precondition:

None.

## Command Parameters:

*Enable:* *Length: 1 Byte*

Value	Parameter Description
0x00	Disable this feature
0x01	Enable this feature

*Central\_SPK\_BD\_ADDR:* *Length: 6 Byte*

Value	Parameter Description
0xFFFFFFFFXXXX	The BT Device Address of Central_SPK. It is Big endian. EX: BT Device Address is "00:11:22:33:44:55". Then it should be represented as "0x001122334455".

[\[Return to Command Table\]](#)

## 5.2.54 Test\_Device (0x3B)

Command	Op Code	Command Parameters	Return Event
Test_Device	0x3B	Test OP code	

## Description:

This command is used to test the assigned device about MFi CP chip validation for OP code = 0x00.

Note: This command is only supported in dual mode SPK 2.1 and ODM project. Please reference to "Command" sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

# Audio UART Command Set

## Precondition:

None.

## Command Parameters:

*Test OP code:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Test CP chip
0x01~0xFF	Reserved

[\[Return to Command Table\]](#)

## 5.2.55 Read\_EEPROM\_Data (0x3C)

Command	Op Code	Command Parameters	Return Event
Read_EEPROM_Data	0x3C	Offset, Length	<a href="#">Report_Read_EEPROM_Data</a>

## Description:

This command is used to read EEPROM data.

Note: This command is only supported in multi-SPK Flash V1.3 and IS2066 WST.  
Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

## Precondition:

None.

## Command Parameters:

*Offset:*

*Length: 2 Byte*

Value	Parameter Description
0xFFFF	EEPROM Offset

*Length:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Read Length (Max Length: 16)

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
-------	-------------	-----------

## Audio UART Command Set

0x03	Parameter error	Read length is bigger than 16 (0x10)
------	-----------------	--------------------------------------

[\[Return to Command Table\]](#)

### 5.2.56 Write\_EEPROM\_Data (0x3D)

Command	Op Code	Command Parameters	Return Event
Write_EEPROM_Data	0x3D	Type, Length, Data	

#### Description:

This command is used to modify the specific data of EEPROM.

For change MSPK Group ID in MSPK2, please use UART command 0x35 Configuration\_Vendor\_Parameter with op code (0x02).

Note: This command is only supported in multi-SPK Flash V1.3 and IS2066 WST. Please reference to “Command” and “Exception Notice” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

None.

#### Command Parameters:

*Type:* *Length: 1 Byte*

Value	Parameter Description
0x00	Modify CSB GIAC

*Length: For Type 0x00* *Length: 1 Byte*

Value	Parameter Description
0x02	Length of GIAC. Must be 2 bytes.

*Data: For Type 0x00* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	CSB GIAC value

*Return error:* *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	1. For other than the given Type value. 2. For Type 0x00: Length is not 2 bytes.

[\[Return to Command Table\]](#)

# Audio UART Command Set

## 5.2.57 LE\_Signaling2\_Cmd (0x3E)

Command	Op Code	Command Parameters	Return Event
LE_Signaling2_Cmd	0x3E	Activity, type, interval, payload_len, payload	None

### Description:

This command is used to do the Bluetooth low energy advertising.

Note: This command is only supported in ODM project. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

### Precondition:

None.

### Command Parameters:

*activity :* *Length: 1 Byte*

Value	Parameter Description
0x00	disable advertising
0x01	enable advertising
others	Reserved

*type :* *Length: 1 Byte*

Value	Parameter Description
0x00	Non-connectable
0x01	Connectable
others	Reserved

*interval :* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	Beacon interval. Range: 0x0020 ~ 0x4000. Unit: 0.625ms

*Payload\_len:* *Length: 1 Byte*

Value	Parameter Description
0xFF	Length of advertising data : N (max 31)

*Payload:* *Length: N Byte*

## Audio UART Command Set

Value	Parameter Description
.....	advertising data

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	For other than given SubCommand_Type
0x01	Command disallow	LE status incorrect

[\[Return to Command Table\]](#)

### 5.2.58 PBAPC\_Cmd(0x3F)

Command	Opcode	Command Parameters	Return Event
PBAP_Client_Cmd	0x3F	Sub_Opcode, Parameters	

This command is only supported in MSPK2 turnkey solution. Not supported in MSPK2 SDK solution and all other products.

#### 5.2.58.1 Open\_PBAP\_Session

Command	Sub-Opcode	Command Parameters	Return Event
Open_PBAP_Session	0x00	Device_Identifier	

#### Description:

This command is used to establish a PBAP session with remote device.

#### Precondition:

None.

#### Command Parameters:

*Device\_Identifier:*  
*Byte*

*Length: 1*

# Audio UART Command Set

Value	Parameter Description
0xXX	Device Identifier

[\[Return to Command Table\]](#)

## 5.2.58.2 Close\_PBAP\_Session

Command	Sub-Opcode	Command Parameters	Return Event
Clos_PBAP_Session	0x01	Device_Identifier	

### Description:

This command is used to disconnect PBAP session from remote device.

### Precondition:

None.

### Command Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description
0xXX	Device Identifier

[\[Return to Command Table\]](#)

## 5.2.58.3 Pull\_Phone\_Book\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Pull_Phone_Book_Req	0x02	Device_Identifier	
		Repository	
		Object_Type	
		Supp_App_Para_Flag	
		Max_List_Count	
		Property_Selector	
		Format	
		List_Start_Offset	
		vCard_Selector	

# Audio UART Command Set

vCard\_Selector\_Opera  
tor

## Description:

This command is used to download Phone Book object from remote device.

## Precondition:

None.

## Command Parameters:

*Device\_Identifier:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*Repository:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Telecom
0x01	SIM1

*Object\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Phone book object
0x01	Incoming calls history object
0x02	Outgoing calls history object
0x03	Missed calls history object
0x04	Combined calls history object
0x05	Speed-Dial object
0x06	Favorite contacts object

*Supp\_App\_Para\_Flag:*

*Length: 2 Bytes*

Bit	Parameter Description
Bit 0	Property Selector 0: Property selector is invalid 1: Property selector is valid
Bit 1	Format_Flag 0: Format is invalid 1: Format is valid
Bit 2	List_Start Offset_Flag 0: List start offset is invalid 1: List start offset is valid
Bit 6	Reset new missed calls



# Audio UART Command Set

0: Not reset  
1: Reset missed call counter

Bit 10 vCard Selector  
0: vCard\_Selector is invalid  
1: vCard\_Selector is valid  
Available if profile version is 1.2

Bit 12 vCard Selector Operator  
0: vCard\_Selector\_Operator is invalid  
1: vCard\_Selector\_Operator is valid  
Available if profile version is 1.2

Bit 14 Max\_List\_Count\_Flag  
0: Max\_List\_Count is invalid  
1: Max\_List\_Count is valid

*Max\_List\_Count:*

*Length: 2 Bytes*

Value	Parameter Description
-------	-----------------------

0xFFFF	The maximum number of entries that PCE can handle
--------	---------------------------------------------------

*Property\_Selector:*

*Length: 8 Bytes*

Value	Parameter Description
-------	-----------------------

0xFFFFFFFF	Refer PB_Property_Selector_Table Bit = 1 indicates that the value shall be present if available
------------	----------------------------------------------------------------------------------------------------

*PB\_Property\_Selector\_Table:*

*Length: 8 Bytes*

Byte 0	Parameter Description
--------	-----------------------

Bit 0	vCard Version
Bit 1	Formatted Name
Bit 2	Structured Presentation of Name
Bit 3	Associated Image or Photo
Bit 4	Birthday
Bit 5	Delivery Address
Bit 6	Delivery
Bit 7	Telephone Number

Byte 1	Parameter Description
--------	-----------------------

Bit 0	Email
Bit 1	Mailer
Bit 2	Time Zone
Bit 3	Geographic Position

## Audio UART Command Set

Bit 4	Job Title
Bit 5	Role within the Organization
Bit 6	Organization Logo
Bit 7	vCard of Person Representing

Byte 2	Parameter Description
Bit 0	Name of Organization
Bit 1	Comments
Bit 2	Revision
Bit 3	Pronunciation of Name
Bit 4	Uniform Resource Locator
Bit 5	Unique ID
Bit 6	Public Encryption Key
Bit 7	Nickname

Byte 3	Parameter Description
Bit 0	Categories
Bit 1	Product ID
Bit 2	Class information
Bit 3	String used for sorting operations
Bit 4	Time stamp
Bit 5	Reserved for future use
Bit 6	Reserved for future use
Bit 7	Reserved for future use

Byte 4	Parameter Description
Bit 0-6	Reserved for future use
Bit 7	Reserved for future use

Byte 5	Parameter Description
Bit 0- 7	Reserved for future use

Byte 6	Parameter Description
Bit 0-7	Reserved for future use

Byte 7	Parameter Description
Bit 0-7	Reserved for future use

*Format:*

*Length: 1 Bytes*

## Audio UART Command Set

Value	Parameter Description
0x00	vCard 2.1
0x01	vCard 3.0

*List\_Start\_Offset:*

*Length: 2 Bytes*

Value	Parameter Description
0XXXXX	The offset of first entry

*vCard\_Selector:*

*Length: 8 Bytes*

Value	Parameter Description
0XXXXXXXX	This parameter is used to filter for vCards that contain the requested vCard properties. Refer PB_Property_Selector_Table Use this parameter to receive only vCards in which the requested set of vCard properties is not null. Bit = 1 indicates that the property is requested Available if profile version is 1.2

*vCard\_Selector\_Operator:*

*Length: 1 Bytes*

Value	Parameter Description
0XXXXXXXX	The parameter vCardSelectorOperator shall only be used in the request together with the parameter vCardSelector. The vCardSelectorOperator determines which logic shall be used when multiple bits of the vCard_Selector parameter are set. A bit value of 0 indicates that (OR) logic shall be used, a bit value of 1 indicates that AND logic shall be used. Available if profile version is 1.2

### 5.2.58.4 Pull\_Vcard\_Listing\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Pull_Vcard_Listing_Req	0x03	Device_Identifier	
		Folder	
		Supp_App_Para_Flag	
		Max_List_Count	
		Order	
		Search_Property	
		List_Start_Offset	
		vCard_Selector	
		vCard_Selector_Operator	
		Search_Value_Length	
		Search_Value	

# Audio UART Command Set

## Description:

This command is used to retrieve a list of Phone Book entries from remote device.

## Precondition:

None.

## Command Parameters:

*Device\_Identifier:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*Folder:*

*Length: 1 Byte*

Value	Parameter Description
0x00	TELECOM
0x01	SIM1
0x02	PB
0x03	ICH
0x04	OCH
0x05	MCH
0x06	CCH
0x07	SPD
0x08	FAV

*Supp\_App\_Para\_Flag:*

*Length: 2 Bytes*

Bit	Parameter Description
Bit 0	N/A
Bit 1	N/A
Bit 2	List_Start Offset_Flag 0: List start offset is invalid 1: List start offset is valid
Bit 3	Order_Flag 0: Order is invalid 1: Order is valid
Bit 4:	Search_Value_Flag 0: Search_Value is invalid 1: Search_Value is valid
Bit 5:	Search_Attribute_Flag 0: Search_Attribute is invalid 1: Search_Attribute is valid
Bit 6	Reset new missed calls 0: Not reset 1: Reset missed call counter
Bit 10	vCard Selector

## Audio UART Command Set

	0: vCard_Selector is invalid 1: vCard_Selector is valid Available if profile version is 1.2
Bit 12	vCard Selector Operator 0: vCard_Selector_Operator is invalid 1: vCard_Selector_Operator is valid Available if profile version is 1.2
Bit 14	Max_List_Count_Flag 0: Max_List_Count is invalid 1: Max_List_Count is valid

*Max\_List\_Count:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	The maximum number of entries that PCE can handle

*Order:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Indexed order: The vCards are ordered by increasing handle order
0x01	Alphabetical order: The sorting operation should be based on the N attribute of the selected folder entries.
0x02	Phonetically ordered: The sorting algorithm should be based on the Sound attribute.

*Search\_Property*

*Length: 1 Byte*

Value	Parameter Description
0xFF	0x00: Name 0x01: Number 0x02: Sound

*List\_Start\_Offset:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	The offset of first entry

*vCard\_Selector:*

*Length: 8 Bytes*

Value	Parameter Description
0xFFFFFFFF	This parameter is used to filter for vCards that contain the requested vCard properties. Refer PB_Property_Selector_Table Use this parameter to receive only vCards in which the requested set of vCard properties is not null. Bit = 1 indicates that the property is requested Available if profile version is 1.2

## Audio UART Command Set

*vCard\_Selector\_Operator:*

*Length: 1 Bytes*

Value	Parameter Description
0XXXXXXXXX	The parameter vCardSelectorOperator shall only be used in the request together with the parameter vCardSelector. The vCardSelectorOperator determines which logic shall be used when multiple bits of the vCard_Selector parameter are set. A bit value of 0 indicates that (OR) logic shall be used, a bit value of 1 indicates that AND logic shall be used. Available if profile version is 1.2

*PB\_Property\_Selector\_Table:*

*Length: 8 Bytes*

Byte 0	Parameter Description
Bit 0	vCard Version
Bit 1	Formatted Name
Bit 2	Structured Presentation of Name
Bit 3	Associated Image or Photo
Bit 4	Birthday
Bit 5	Delivery Address
Bit 6	Delivery
Bit 7	Telephone Number

Byte 1	Parameter Description
Bit 0	Email
Bit 1	Mailer
Bit 2	Time Zone
Bit 3	Geographic Position
Bit 4	Job Title
Bit 5	Role within the Organization
Bit 6	Organization Logo
Bit 7	vCard of Person Representing

Byte 2	Parameter Description
Bit 0	Name of Organization
Bit 1	Comments
Bit 2	Revision
Bit 3	Pronunciation of Name
Bit 4	Uniform Resource Locator
Bit 5	Unique ID
Bit 6	Public Encryption Key
Bit 7	Nickname

Byte 3	Parameter Description
Bit 0	Categories

## Audio UART Command Set

Bit 1	Product ID
Bit 2	Class information
Bit 3	String used for sorting operations
Bit 4	Time stamp
Bit 5	Reserved for future use
Bit 6	Reserved for future use
Bit 7	Reserved for future use

Byte 4	Parameter Description
Bit 0-6	Reserved for future use
Bit 7	Reserved for future use

Byte 5	Parameter Description
Bit 0- 7	Reserved for future use

Byte 6	Parameter Description
Bit 0-7	Reserved for future use

Byte 7	Parameter Description
Bit 0-7	Reserved for future use

*Search\_Value\_Length* *Length: 1 Bytes*

Value	Parameter Description
0xXX	Search value length

*Search\_Val* *Length: Search\_Value\_Length Bytes*

Value	Parameter Description
0xXX	Search value

### 5.2.58.5 Pull\_Vcard\_Entry\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Pull_Vcard_Entry_Re q	0x04	Device_Identifier	

## Audio UART Command Set

Option
Supp_App_Para_Flag
Property_Selector
Format
Entry_Name

### Description:

This command is used to retrieve a Phone Book entry from remote device.

### Precondition:

None.

### Command Parameters:

*Device\_Identifier:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*Option:* *Length: 1 Byte*

Value	Parameter Description
0x00	Object name: *.vcf
0x01	Object name: X-BT-UID

*Supp\_App\_Para\_Flag:* *Length: 2 Bytes*

Bit	Parameter Description
Bit 0	Filter_Flag 0: Filter is invalid 1: Filter is valid
Bit 1	Format_Flag 0: Format is invalid 1: Format is valid

*Property\_Selector:* *Length: 8 Bytes*

Value	Parameter Description
0xFFFFFFFF	Refer PB_Property_Selector_Table Bit = 1 indicates that the value shall be present if available

*PB\_Property\_Selector\_Table:* *Length: 8 Bytes*



# Audio UART Command Set

Byte 0	Parameter Description
Bit 0	vCard Version
Bit 1	Formatted Name
Bit 2	Structured Presentation of Name
Bit 3	Associated Image or Photo
Bit 4	Birthday
Bit 5	Delivery Address
Bit 6	Delivery
Bit 7	Telephone Number

Byte 1	Parameter Description
Bit 0	Email
Bit 1	Mailer
Bit 2	Time Zone
Bit 3	Geographic Position
Bit 4	Job Title
Bit 5	Role within the Organization
Bit 6	Organization Logo
Bit 7	vCard of Person Representing

Byte 2	Parameter Description
Bit 0	Name of Organization
Bit 1	Comments
Bit 2	Revision
Bit 3	Pronunciation of Name
Bit 4	Uniform Resource Locator
Bit 5	Unique ID
Bit 6	Public Encryption Key
Bit 7	Nickname

Byte 3	Parameter Description
Bit 0	Categories
Bit 1	Product ID
Bit 2	Class information
Bit 3	String used for sorting operations
Bit 4	Time stamp
Bit 5	Reserved for future use
Bit 6	Reserved for future use
Bit 7	Reserved for future use

Byte 4	Parameter Description
Bit 0-6	Reserved for future use

## Audio UART Command Set

Bit 7	Reserved for future use
-------	-------------------------

Byte 5	Parameter Description
Bit 0- 7	Reserved for future use

Byte 6	Parameter Description
Bit 0-7	Reserved for future use

Byte 7	Parameter Description
Bit 0-7	Reserved for future use

*Format:* *Length: 1 Byte*

Value	Parameter Description
0x00	vCard 2.1
0x01	vCard 3.0

*Entry\_Name:* *Length: xx*  
*Bytes*

Value	Parameter Description
0xXX	vCard Entry Name, without filename extension For example: “16.vcf”, the value is: 31 36 “25.vcf”, the value is: 32 35

[\[Return to Command Table\]](#)

### 5.2.58.6 Set\_Phone\_Book\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Pull_Phone_Bbook_Req	0x05	Device_Identifier	
		Action	
		Folder	

#### Description:

This command is used to set current folder in the virtual folder architecture.

#### Precondition:

## Audio UART Command Set

None.

### Command Parameters:

*Device\_Identifier:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*Action:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Go back to root
0x01	Go down 1 level
0x02	Go up 1 level

*Folder:*

*Length: 1 Byte*

Value	Parameter Description
0x00	TELECOM
0x01	SIM1
0x02	PB
0x03	ICH
0x04	OCH
0x05	MCH
0x06	CCH
0x07	SPD
0x08	FAV

### 5.2.58.7 Abort\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Abort_Req	0x06	Device_Identifier	

### Description:

This command is used to abort request.

### Precondition:

None.

### Command Parameters:

## Audio UART Command Set

*Device\_Identifier:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

[\[Return to Command Table\]](#)

### 5.2.58.8 Parameter\_Configure

Command	Sub-Opcode	Command Parameters	Return Event
Parameter_Configure	0x07	Device_Identifier	
		Para_Flag1	
		Para_Flag2	
		Para_Flag3	
		Para_Flag4	

#### Description:

This command is used to perform PBAP parameter configuration. This command should be sent before following operation: Pull\_Phone\_Book\_Req (sub-opcode 0x02), Pull\_Vcard\_Listing\_Req (sub-opcode 0x03), and Pull\_Vcard\_Entry\_Req (sub-opcode 0x04). You need only sent this command once, but you should not change command parameters during profile's connected cycle.

#### Precondition:

PBAP profile is connected.

#### Command Parameters:

*Device\_Identifier:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*PARAM\_FLAG1:*

*Length: 1 Byte*

Value	Parameter Description
Bit 0	Disable SRMP header
Bit 1-7	Reserved

*PARAM\_FLAG2*

*Length: 1 Byte*

Value	Parameter Description
0xXX	reserved

## Audio UART Command Set

*PARAM\_FLAG3:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	reserved

*PARAM\_FLAG4:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	reserved

[\[Return to Command Table\]](#)

### 5.2.59 TWS\_CMD(0x40)

Command	Opcode	Command Parameters	Return Event
TWS_Cmd	0x40	Sub_Opcode, Parameters	

This command is only supported in IS2066 WST. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

The following section defines the UART command for TWS applications

Command	Sub-Opcode	Command Parameters	Return Event
TWS_SEND_VENDOR_DATA_TO_REMOTE	0x00	Data	
TWS_READ_LOCAL_DEVICE_STATUS	0x01		REPORT_TWS_LOCAL_DEVICE_STATUS
TWS_ASSIGN_BOX_ST ATE	0x02		
TWS_READ_EAR_BUD_POSITION	0x03	None	<a href="#">REPORT_TWS_EAR_BUD_POSITION</a>
TWS_READ_SECONDARY_DEVICE_STATUS	0x04	None	<a href="#">REPORT_TWS_SECONDARY_DEVICE_STATUS</a>

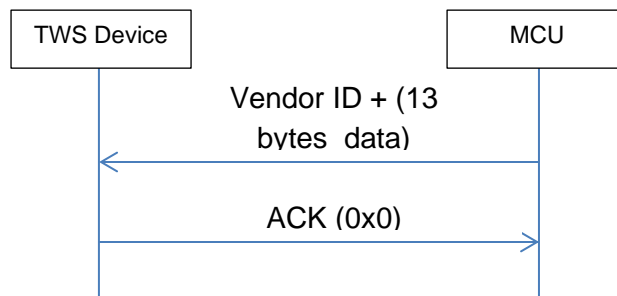
## Audio UART Command Set

### 5.2.59.1 TWS\_SEND\_VENDOR\_DATA\_TO\_REMOTE

Command	Opcode/Sub-opcode	Command Parameters	Return Event
TWS_SEND_VENDOR_DATA_TO_REMOTE	0x40/0x00	Vendor_ID, data	

#### Description:

This command is used to send the data to remote device. The transmitted data size of this command is 14 bytes. And the remote device will get the event and the event id is "REPORT\_TWS\_RX\_VENDOR\_DATA\_EVENT"



#### Precondition:

None.

#### Command Parameters:

*Vendor\_ID:*

*Length: 1 Byte*

Value	Parameter Description
0x0~0x1F	Reserved by internal usage
0x20~0x3F	Host/MCU assigned by itself

*Content:*

*Length: 13 Byte*

Value	Parameter Description
0xXX	Content, assigned by Host/MCU

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x04	BTM busy	No enough resource to handle this command, wait and try again

[\[Return to Command Table\]](#)

# Audio UART Command Set

## 5.2.59.2 TWS\_READ\_LOCAL\_DEVICE\_STATUS

Command	Opcode/ Sub- opcode	Command Parameters	Return Event
TWS_READ_LOCAL_DEVICE_STATUS	0x40/0x01	NO	REPORT_TWS_LOCAL_DEVICE_STATUS

### Description:

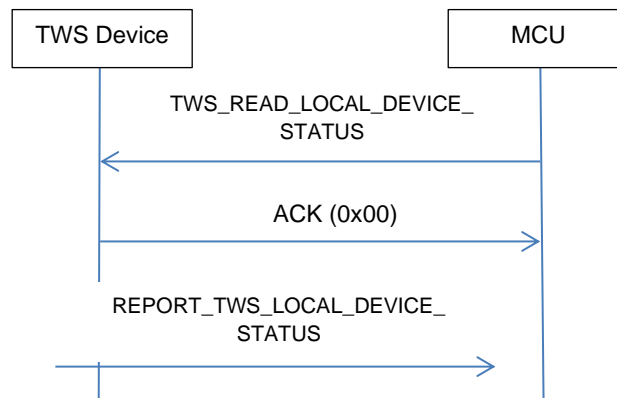
This command is used to read the TWS value of some status.

### Precondition:

None.

### Command Parameters:

None



[\[Return to Command Table\]](#)

## 5.2.59.3 TWS\_ASSIGN\_BOX\_STATE

Command	Opcode/ Sub- opcode	Command Parameters	Return Event
TWS_ASSIGN_BOX_STATE	0x40/0x02	NO	

### Description:

This command is used to assign the in/out charging box state.

### Precondition:

## Audio UART Command Set

The EEPROM option ENABLE\_HOST\_MCU\_CTRL\_TWS\_BOX\_STATE is enabled.

### Command Parameters:

None

#### 5.2.59.4 TWS\_READ\_EAR\_BUD\_POSITION

Command	Opcode/ Sub- opcode	Command Parameters	Return Event
TWS_READ_LOCAL_DEVICE_STATUS	0x40/0x03	NONE	<a href="#">REPORT_TWS_EAR_BUD_POSITION</a>

### Description:

This command is used to read the TWS earbud position.

### Precondition:

None.

### Command Parameters:

None

#### 5.2.59.5 TWS\_READ\_SECONDARY\_DEVICE\_STATUS

Command	Opcode/ Sub- opcode	Command Parameters	Return Event
TWS_READ_REMOTE_DEVICE_STATUS	0x40/0x04	NO	<a href="#">REPORT_TWS_REMOTE_DEVICE_STATUS</a>

### Description:

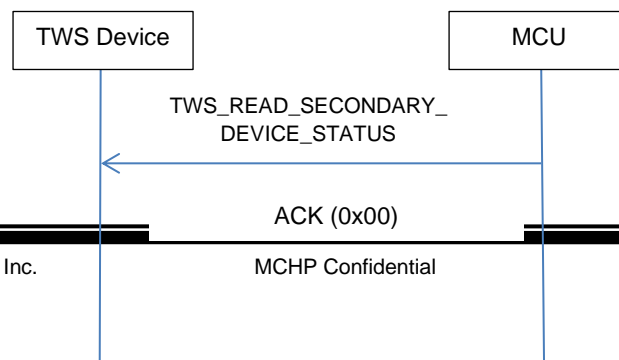
This command is used to read the TWS status values of secondary device.

### Precondition:

None.

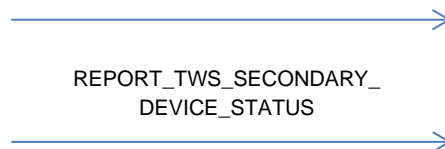
### Command Parameters:

None





# Audio UART Command Set



## 5.2.60 AVRCP\_Browsing\_Cmd (0x41)

Command	Op Code	Command Parameters	Return Event
AVRCP_Browsing_Cmd	0x41	Sub_Opcode, Parameters	<a href="#">AVRCP_Browsing_Event</a>

### Description:

This command is used to trigger AVRCP Browsing command to the remote device (TG role).

Note: This command is only supported in SPP and PBAP target in MSPK2 and Audio Transceiver. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

### Precondition:

AVRCP link has been established.

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No AVRCP connection exist
0x03	Parameter error	Incorrect parameter value
0x05	BTM Memory Full	OS heap memory is full

### 5.2.60.1 GetFolderItems

Command	Sub-Opcode	Command Parameters	Return Event
GetFolderItems	0x00	Data_Base_Index	<a href="#">AVRCP_Browsing_Event</a>
		Scope	
		Start_Item	
		End_Item	
		Attribute_Count	
		Attribute_List	

### Description:

This command is used to retrieve a listing of the contents of a folder.

### Precondition:

## Audio UART Command Set

AVRCP link has been established.

### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Scope*

*Length: 1 Byte*

Value	Parameter Description
0x00	Contains all available media players.
0x01	The virtual filesystem containing the media content of the browsed player.
0x02	The results of a search operation on the browsed player.
0x03	The Now Playing list (or queue) of the addressed player.

*Start\_Item*

*Length: 4 Byte*

Value	Parameter Description
0XXXXXXXX	The offset within the listing of the item, which should be the first returned item. The first element in the listing is at offset 0.

*End\_Item*

*Length: 4 Byte*

Value	Parameter Description
0XXXXXXXX	The offset within the listing of the item which should be the final returned item.

*Attribute\_Count*

*Length: 1 Byte*

Value	Parameter Description
0x00	All attributes are requested. There is no following Attribute List.
0x01-0xFE	The following Attribute List contains this number of attributes.
0xFF	No attributes are requested. There is no following Attribute List.

*Attribute\_List*

*Length: N Byte*

Value	Parameter Description
0XXXXXXXX...	Attributes which are requested to be returned for each item returned. One attribute is 4 bytes. Therefore, the length of attribute list will be 4 * Attribute_Count bytes.

## Audio UART Command Set

Value	Parameter Description
0x00000001	Title
0x00000002	Artist Name
0x00000003	Album Name
0x00000004	Track Number
0x00000005	Total Numbers of Tracks
0x00000006	Genre
0x00000007	Playing Time
0x00000008	Default Cover Art (NOT SUPPORTED)
0x00000009~ 0xFFFFFFFF	Reserved for future used

[\[Return to Command Table\]](#)

### 5.2.60.2 GetTotalNumberOfItems

Command	Sub-Opcode	Command Parameters	Return Event
GetTotalNumber OfItems	0x01	Data_Base_Index  Scope	<a href="#">AVRCP_Browsing_Event</a>

#### Description:

This command is used to retrieve the number of items in a folder prior to calling GetFolderItems to retrieve a listing of the contents of a folder.

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

## Audio UART Command Set

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Scope*

*Length: 1 Byte*

Value	Parameter Description
0x00	Contains all available media players.
0x01	The virtual filesystem containing the media content of the browsed player.
0x02	The results of a search operation on the browsed player.
0x03	The Now Playing list (or queue) of the addressed player.

[\[Return to Command Table\]](#)

### 5.2.60.3 SetAddressedPlayer

Command	Sub-Opcode	Command Parameters	Return Event
SetAddressedPlayer	0x02	Data_Base_Index PlayerId	<a href="#">AVRCP_Browsing_Event</a>

#### Description:

This command is used to inform the TG of which media player the CT wishes to control.

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*PlayerId*

*Length: 2 Byte*

Value	Parameter Description
-------	-----------------------

# Audio UART Command Set

0XXXXX

Unique Media Player Id

[\[Return to Command Table\]](#)

## 5.2.60.4 SetBrowsedPlayer

Command	Sub-Opcode	Command Parameters	Return Event
SetBrowsedPlayer	0x03	Data_Base_Index PlayerId	<a href="#">AVRCP_Browsing_Event</a>

### Description:

This command is used to control to which player browsing commands should be routed.

### Precondition:

AVRCP link has been established.

### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*PlayerId*

*Length: 2 Byte*

Value	Parameter Description
0XXXXX	Unique Media Player Id

[\[Return to Command Table\]](#)

## 5.2.60.5 ChangePath

Command	Sub-Opcode	Command Parameters	Return Event
ChangePath	0x04	Data_Base_Index UIDCounter	<a href="#">AVRCP_Browsing_Event</a>

## Audio UART Command Set

Direction
FolderUID

### Description:

This command is used to navigate the virtual filesystem.

### Precondition:

AVRCP link has been established.

### Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*UIDCounter* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The UID Counter

*Direction* *Length: 1 Byte*

Value	Parameter Description
0x00	Folder Up
0x01	Folder Down

*FolderUID* *Length: 8 Byte*

Value	Parameter Description
0XXXXXXXXXXXXXXXXX	The UID of the folder to navigate to. This may be retrieved via a <a href="#">GetFolderItems</a> command. If the navigation command is Folder Up, then this field is reserved (Set as 0).

[\[Return to Command Table\]](#)

### 5.2.60.6 GetItemAttributes

Command	Sub-Opcode	Command Parameters	Return Event
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# Audio UART Command Set

GetItemAttribute s	0x05	Data_Base_Index	<a href="#">AVRCP_Browsing_Event</a>
		Scope	
		UID	
		UIDCounter	
		Attributes_Num	
		AttributeID_List	

## Description:

This command is used to retrieve the metadata attributes for a particular media element item or folder item.

## Precondition:

AVRCP link has been established.

## Command Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Scope* *Length: 1 Byte*

Value	Parameter Description
0x00	Contains all available media players.
0x01	The virtual filesystem containing the media content of the browsed player.
0x02	The results of a search operation on the browsed player.
0x03	The Now Playing list (or queue) of the addressed player.

*UID* *Length: 8 Byte*

Value	Parameter Description
0XXXXXXXXXXXXXXXXX	The UID of the media element item or folder item to return the attributes

*UIDCounter* *Length: 2 Byte*

Value	Parameter Description
0XXXXX	The UID Counter

*Attributes\_Num* *Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	The number of attribute IDs in the following Attribute ID list. If this value is zero, then all attributes are requested.

*AttributeID\_List*

*Length: N Byte*

Value	Parameter Description
0XXXXXXXXX...	Attributes which are requested to be returned for each item returned. One attribute is 4 bytes. Therefore, the length of attribute list will be 4 * Attribute_Count bytes.

[\[Return to Command Table\]](#)

### 5.2.60.7 Search

Command	Sub-Opcode	Command Parameters	Return Event
Search	0x06	Data_Base_Index Length SearchString	<a href="#">AVRCP_Browsing_Event</a>

#### Description:

This command is used to perform search functionality.

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Length*

*Length: 2 Byte*

Value	Parameter Description
0XXXXX	The length of the search string in octets.



## Audio UART Command Set

*SearchString*

*Length: N Byte*

Value	Parameter Description
0xFFFF...	The string to search on in the specified character set.

[\[Return to Command Table\]](#)

### 5.2.60.8 PlayItem

Command	Sub-Opcode	Command Parameters	Return Event
PlayItem	0x07	Data_Base_Index	<a href="#">AVRCP_Browsing_Event</a>
		Scope	
		UID	
		UIDCounter	

#### Description:

This command is used to start playing an item indicated by the UID.

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Linked device index

*Scope*

*Length: 1 Byte*

Value	Parameter Description
0x00	Contains all available media players.
0x01	The virtual filesystem containing the media content of the browsed player.
0x02	The results of a search operation on the browsed player.
0x03	The Now Playing list (or queue) of the addressed player.

*UID*

*Length: 8 Byte*

Value	Parameter Description
0xFFFFFFFFFFFFFFFF	The UID of the media element item or folder item.

## Audio UART Command Set

*UIDCounter*

*Length: 2 Byte*

Value	Parameter Description
0xXXXX	The UID Counter

[\[Return to Command Table\]](#)

### 5.2.60.9 AddToNowPlaying

Command	Sub-Opcode	Command Parameters	Return Event
AddToNowPlaying	0x08	Data_Base_Index	<a href="#">AVRCP_Browsing_Event</a>
		Scope	
		UID	
		UIDCounter	

#### Description:

This command is used to add an item indicated by the UID to the Now Playing queue.

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Scope*

*Length: 1 Byte*

Value	Parameter Description
0x00	Contains all available media players.
0x01	The virtual filesystem containing the media content of the browsed player.
0x02	The results of a search operation on the browsed player.
0x03	The Now Playing list (or queue) of the addressed player.

*UID*

*Length: 8 Byte*

## Audio UART Command Set

Value	Parameter Description
0XXXXXXXXXXXXXXXXX	The UID of the media element item or folder item.

*UIDCounter*

*Length: 2 Byte*

Value	Parameter Description
0XXXXX	The UID Counter

[\[Return to Command Table\]](#)

### 5.2.61 Read\_Paired\_Link\_Key\_Info (0x42)

Command	Op Code	Command Parameters	Return Event
Read_Paired_Link_Key_Info	0x42	Reserved	REPORT_PAIRED_LINK_KEY_INFO

#### Description:

This command is used to read the paired device link key information from BTM. The information is useful in capturing air log by sniffer.

#### Precondition:

None.

#### Command Parameters:

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to Command Table\]](#)

### 5.2.62 Autio\_Transceiver\_Cmd (0x44)

Command	Op Code	Command Parameters	Return Event
Audio Transceiver Cmd	0x44	Sub_Opcode, Parameters	<a href="#">Audio_Transceiver_Stat us</a>

#### Description:

This section defines the UART commands used for Audio Transceiver Commands.

Sub Command	Sub Op Code	Sub Command Parameters	Sub Return Event
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## Audio UART Command Set

Device Discovery	0x00	Timeout, Number_Of_Responses, Filter_Option, Report_Option, Filter_RSSI_Value	<a href="#">Discovery</a> <a href="#">Response</a> , <a href="#">Discovery</a> <a href="#">Complete</a>
Discovery Cancel	0x01	None	None
Change Audio Input Source	0x02	Audio Mode	<a href="#">Audio Input Source</a>
Change Application Mode	0x03	AT APP Mode	<a href="#">App Mode</a>
Read Application Mode	0x04	None	<a href="#">App Mode</a>
Read Audio Input Source	0x05	None	<a href="#">Audio Input Source</a>
Change Audio-in Sampling Rate	0x06	Sampling Rate	<a href="#">Audio-In Sampling Rate</a>
Read Audio-in Sampling Rate	0x07	None	<a href="#">Audio-In Sampling Rate</a>
Block A2DP Streaming Out	0x08	block_stream	None

### 5.2.62.1 Device\_Discovery (0x00)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Device_Discovery	0x44/0x00	Timeout, Number_Of_Responses, Filter_Option, Report_Option, Filter_RSSI_Value	<a href="#">Audio_Tranciver_Status</a> <a href="#">/Discovery_Response</a> , <a href="#">Audio_Tranciver_Status</a> <a href="#">/Discovery_Complete</a>

#### Description:

This command causes the BTM to find nearby interesting BT devices by filter option settings.

#### Precondition:

The app state should be in APP\_STATE\_STANDBY.

#### Command Parameters:

*Timeout:*

*Length: 1 Byte*

Value	Parameter Description
0x01 – 0x30	Maximum amount of time specified before the Device Discovery is halted. Unit: 1.28 sec

*Number\_of\_Responses:*  
*Byte*

*Length: 1*

## Audio UART Command Set

Value	Parameter Description
0xXX	Maximum number of responses from the Device_Discovery_Response before the Device_Discovery is halted.

*Filter\_Option:*

*Length: 1*

*Byte*

Value	Parameter Description
Bit 0	0b00: Disable generic Audio CoD filter option. 0b01: Enable generic Audio CoD filter option. While it is enabled, BTM will check CoD value in received inquiry result. If both “Audio (speaker, microphone, headset service etc)” bit in Major Service Class and “Audio/Video (headset, speaker, stereo, video display etc)” bit in Major Device Class are asserted, this discovery result will be valid for this filter option.
Bit 1	1b00: Disable RSSI filter option. 1b01: Enable RSSI filter option. While it is enabled, BTM will check RSSI value in received inquiry result. If it is larger than Filter_RSSI_Value, this discovery result will be valid for this filter option.
Others	Reserved

*Report\_Option:*

*Length: 1*

*Byte*

Value	Parameter Description
Bit 0	0b00: Disable including EIR in Discover Response. 0b01: Include EIR in Discover Response.
Others	Reserved

*Filter\_RSSI\_Value:*

*Length: 1 Bytes*

Value	Parameter Description
0xXX	RSSI filter option value setting. Range: -127 to +20 Units: dBm.

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x00	Success	The command has been successfully sent
0x01	Command Disallow	The application state is not in standby or the device is connected.
0x03	Parameter error	Input parameters not valid or not in range
0x05	Memory Full	No available memory

## Audio UART Command Set

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[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.62.2 Discovery\_Cancel (0x01)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Discovery_Cancel	0x44/0x01	None	None

#### Description:

This command causes the BR/EDR Controller to cancel Discovery.

#### Precondition:

The app state should be in APP\_STATE\_INQUIRY.

#### Command Parameters:

None

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x00	Success	The command has been successfully sent
0x01	Command Disallow	The application state is not in inquiry mode.

[\[Return to Command Table\]](#)

### 5.2.62.3 Change\_Audio\_Input\_Source\_Cmd (0x02)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Change_Audio_Source_Cmd	0x44/0x02	Audio Mode	<a href="#">Audio Input Source</a>

#### Description:

This command is used to change the audio input source.

**Note:** This command will cause audio break due to DSP restart process.

#### Precondition:

The Application state should be in TX mode

#### Command Parameters:

*Audio Mode :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Line-In mode

## Audio UART Command Set

0x01	I2S-In mode
------	-------------

[\[Return to Command Table\]](#)

### 5.2.62.4 Change\_APP\_Mode\_Cmd (0x03)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Change_APP_Mode_Cmd	0x44/0x03	AT APP Mode	<a href="#">APP Mode</a>

#### Description:

This command is used to change the Application mode.

**Note:** *The Application shall be reset after the application mode is changed.*

#### Precondition:

None.

#### Command Parameters:

AT APP Mode :

Length: 1 Byte

Value	Parameter Description
0x00	TX mode (A2DP SRC)
0x01	RX mode (A2DP SNK)

[\[Return to Command Table\]](#)

### 5.2.62.5 Read\_App\_Mode (0x04)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Read_AT_App_Mode	0x44/0x04	None	<a href="#">App Mode</a>

#### Description:

This command is used to read the current audio transceiver application mode.

#### Precondition:

None.



# Audio UART Command Set

## Command Parameters:

None.

[\[Return to Command Table\]](#)

### 5.2.62.6 Read\_Audio\_Input\_Source (0x05)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Read_AT_Audio_Input_Source	0x44/0x05	None	<a href="#">Audio Input Source</a>

## Description:

This command is used to read the current audio input source in audio transceiver Tx mode.

## Precondition:

The Application state should be in TX mode

## Command Parameters:

None.

[\[Return to Command Table\]](#)

### 5.2.62.7 Change\_Audio\_In\_Sampling\_Rate\_Cmd (0x06)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Change_AT_Audio_In_Sampling_Rate_Cmd	0x44/0x06	Sampling Rate	<a href="#">Audio-In Sampling Rate</a>

## Description:

This command is used to change the sampling rate of the Audio Input Source. This shall be used by SBC Encoder.

**Note:** This command will cause audio break due to DSP restart process

## Precondition:

None.

## Command Parameters:

## Audio UART Command Set

*Sampling Rate:*

*Length: 1 Byte*

Value	Parameter Description
0x00	48 KHz
0x01	44.1 KHz

[\[Return to Command Table\]](#)

### 5.2.62.8 Read\_Audio\_In\_Sampling\_Rate\_Cmd (0x07)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
Read_AT_Audio_In_Sampli ng_Rate_Cmd	0x44/0x07	None	<a href="#">Audio-In Sampling Rate</a>

#### Description:

This command is used to read the sampling rate of the Audio Input Source. This shall be used by SBC Encoder.

#### Precondition:

None.

#### Command Parameters:

None.

[\[Return to Command Table\]](#)

### 5.2.62.9 Block A2DP Streaming Out (0x08)

Command	Op Code/Sub Opcode	Command Parameters	Return Event/ Return Sub-Event
AT_Block_A2DP_Streamin g_Out_Cmd	0x44/0x08	block_stream	None

#### Description:

This command is used to block/unblock transmitting of A2dp SBC encode packets to the A2dp Sink. By default, the streaming out of the packets to remote A2dp Sink is unblocked in FW.

Note: It does not send out START / SUSPEND AVDTP commands.

#### Precondition:

None.

# Audio UART Command Set

## Command Parameters:

*Block Stream:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Disable
0x01	Enable

[\[Return to Command Table\]](#)

### 5.2.63 Button\_MMI\_Setting\_Cmd (0x46)

Command	Op Code	Command Parameters	Return Event
Button_MMI_Setting_Cmd	0x46	Destination, Button Operation, Call State[i], MMI Action[i]	

#### Description:

This command is used to change the button MMI Settings. These changes will be stored back to NVM.

There can be set max to 9 pairs of Call State and MMI Action in one command the number of Call States supported in the project.

Note: This command is only supported in IS2066 WST. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

The WST link must exist if the Destination parameter is set to Left side or Right side.

## Command Parameters:

*Destination :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Local side
0x01	Left side (for WST)
0x02	Right side (for WST)

*Button Operation:*

*Length: 1 Byte*

Value	Parameter Description
0x01	Button 0 short press (MFB)
0x02	Button 0 long press (MFB)
0x03	Button 1 short press
0x04	Button 1 long press
0x05	Button 2 short press
0x06	Button 2 long press
0x07	Button 3 short press

## Audio UART Command Set

0x08	Button 3 long press
0x09	Button 4 short press
0x0A	Button 4 long press
0x0B	Button 5 short press
0x0C	Button 5 long press
0x0D - 0x80	Reserved
0x81	Button 0 double press
0x82	Button 1 double press
0x83	Button 2 double press
0x84	Button 3 double press
0x85	Button 4 double press
0x86	Button 5 double press
0x87	Button 0 and button 1 short press at the same time
0x88	Button 0 and button 2 short press at the same time
0x89	Button 0 and button 3 short press at the same time
0x8A	Button 0 and button 4 short press at the same time
0x8B	Button 0 and button 5 short press at the same time
0x8C	Button 1 and button 2 short press at the same time
0x8D	Button 1 and button 3 short press at the same time
0x8E	Button 1 and button 4 short press at the same time
0x8F	Button 1 and button 5 short press at the same time
0x90	Button 2 and button 3 short press at the same time
0x91	Button 2 and button 4 short press at the same time
0x92	Button 2 and button 5 short press at the same time
0x93	Button 3 and button 4 short press at the same time
0x94	Button 3 and button 5 short press at the same time
0x95	Button 4 and button 5 short press at the same time
0x96	Button 0 and button 1 long press at the same time
0x97	Button 0 and button 2 long press at the same time
0x98	Button 0 and button 3 long press at the same time
0x99	Button 0 and button 4 long press at the same time
0x9A	Button 0 and button 5 long press at the same time
0x9B	Button 1 and button 2 long press at the same time
0x9C	Button 1 and button 3 long press at the same time
0x9D	Button 1 and button 4 long press at the same time
0x9E	Button 1 and button 5 long press at the same time
0x9F	Button 2 and button 3 long press at the same time
0xA0	Button 2 and button 4 long press at the same time
0xA1	Button 2 and button 5 long press at the same time
0xA2	Button 3 and button 4 long press at the same time
0xA3	Button 3 and button 5 long press at the same time
0xA4	Button 4 and button 5 long press at the same time
0xA5	Button 0 triple press
0xA6	Button 1 triple press
0xA7	Button 2 triple press

## Audio UART Command Set

0xA8	Button 3 triple press
0xA9	Button 4 triple press
0xAA	Button 5 triple press

*Call State :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Standby (no talk)
0x01	Voice dial triggered
0x02	Incoming call
0x03	Outgoing call
0x04	Call active with single call
0x05	Single link with multi-call (1 active and 1 waiting)
0x06	Single link with multi-call (1 active and 1 hold)
0x07	Multiple link with multi-call (1 active and 1 waiting)
0x08	Multiple link with multi-call (1 active and 1 hold)

*MMI action :*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Refer to <a href="#">MMI_Action</a> for the definition

[\[Return to Command Table\]](#)

### 5.2.64 Button\_Operation\_Cmd (0x47)

Command	Op Code	Command Parameters	Return Event
Button_Operation_Cmd	0x47	Button Operation,	

#### Description:

This command is to inform BTM a button operation is triggered by the user. BTM will process the corresponding MMI action base on the button setting in UI table.

Note: This command is only supported in IS2066 WST. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

None.

#### Command Parameters:

# Audio UART Command Set

Button Behavior:

Length: 1 Byte

Value	Parameter Description
0x01	Button 0 short press (MFB)
0x02	Button 0 long press (MFB)
0x03	Button 1 short press
0x04	Button 1 long press
0x05	Button 2 short press
0x06	Button 2 long press
0x07	Button 3 short press
0x08	Button 3 long press
0x09	Button 4 short press
0x0A	Button 4 long press
0x0B	Button 5 short press
0x0C	Button 5 long press
0x0D - 0x80	Reserved
0x81	Button 0 double press
0x82	Button 1 double press
0x83	Button 2 double press
0x84	Button 3 double press
0x85	Button 4 double press
0x86	Button 5 double press
0x87	Button 0 and button 1 short press at the same time
0x88	Button 0 and button 2 short press at the same time
0x89	Button 0 and button 3 short press at the same time
0x8A	Button 0 and button 4 short press at the same time
0x8B	Button 0 and button 5 short press at the same time
0x8C	Button 1 and button 2 short press at the same time
0x8D	Button 1 and button 3 short press at the same time
0x8E	Button 1 and button 4 short press at the same time
0x8F	Button 1 and button 5 short press at the same time
0x90	Button 2 and button 3 short press at the same time
0x91	Button 2 and button 4 short press at the same time
0x92	Button 2 and button 5 short press at the same time
0x93	Button 3 and button 4 short press at the same time
0x94	Button 3 and button 5 short press at the same time
0x95	Button 4 and button 5 short press at the same time
0x96	Button 0 and button 1 long press at the same time
0x97	Button 0 and button 2 long press at the same time
0x98	Button 0 and button 3 long press at the same time
0x99	Button 0 and button 4 long press at the same time
0x9A	Button 0 and button 5 long press at the same time
0x9B	Button 1 and button 2 long press at the same time
0x9C	Button 1 and button 3 long press at the same time
0x9D	Button 1 and button 4 long press at the same time
0x9E	Button 1 and button 5 long press at the same time

## Audio UART Command Set

0x9F	Button 2 and button 3 long press at the same time
0xA0	Button 2 and button 4 long press at the same time
0xA1	Button 2 and button 5 long press at the same time
0xA2	Button 3 and button 4 long press at the same time
0xA3	Button 3 and button 5 long press at the same time
0xA4	Button 4 and button 5 long press at the same time
0xA5	Button 0 triple press
0xA6	Button 1 triple press
0xA7	Button 2 triple press
0xA8	Button 3 triple press
0xA9	Button 4 triple press
0xAA	Button 5 triple press

[\[Return to Command Table\]](#)

### 5.2.65 Read\_Button\_MMI\_Setting\_Cmd (0x48)

Command	Op Code	Command Parameters	Return Event
Read_Button_MMI_Setting_Cmd	0x48	Destination, Button Operation, Call State[i]	Read_Button_MMI_Setting_Reply

#### Description:

This command is used to change the button MMI Settings.

It can query max to 9 MMI setting of Call State in one command base on the number of Call States supported in the project.

Note: This command is only supported in IS2066 WST. Please reference to “Command” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

#### Precondition:

The WST link must exist if the Destination parameter is set to Left side or Right side.

#### Command Parameters:

*Destination :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Local side
0x01	Left side (for WST)
0x02	Right side (for WST)

# Audio UART Command Set

Button Operation:

Length: 1 Byte

Value	Parameter Description
0x01	Button 0 short press (MFB)
0x02	Button 0 long press (MFB)
0x03	Button 1 short press
0x04	Button 1 long press
0x05	Button 2 short press
0x06	Button 2 long press
0x07	Button 3 short press
0x08	Button 3 long press
0x09	Button 4 short press
0x0A	Button 4 long press
0x0B	Button 5 short press
0x0C	Button 5 long press
0x0D - 0x80	Reserved
0x81	Button 0 double press
0x82	Button 1 double press
0x83	Button 2 double press
0x84	Button 3 double press
0x85	Button 4 double press
0x86	Button 5 double press
0x87	Button 0 and button 1 short press at the same time
0x88	Button 0 and button 2 short press at the same time
0x89	Button 0 and button 3 short press at the same time
0x8A	Button 0 and button 4 short press at the same time
0x8B	Button 0 and button 5 short press at the same time
0x8C	Button 1 and button 2 short press at the same time
0x8D	Button 1 and button 3 short press at the same time
0x8E	Button 1 and button 4 short press at the same time
0x8F	Button 1 and button 5 short press at the same time
0x90	Button 2 and button 3 short press at the same time
0x91	Button 2 and button 4 short press at the same time
0x92	Button 2 and button 5 short press at the same time
0x93	Button 3 and button 4 short press at the same time
0x94	Button 3 and button 5 short press at the same time
0x95	Button 4 and button 5 short press at the same time
0x96	Button 0 and button 1 long press at the same time
0x97	Button 0 and button 2 long press at the same time
0x98	Button 0 and button 3 long press at the same time
0x99	Button 0 and button 4 long press at the same time
0x9A	Button 0 and button 5 long press at the same time
0x9B	Button 1 and button 2 long press at the same time
0x9C	Button 1 and button 3 long press at the same time



## Audio UART Command Set

0x9D	Button 1 and button 4 long press at the same time
0x9E	Button 1 and button 5 long press at the same time
0x9F	Button 2 and button 3 long press at the same time
0xA0	Button 2 and button 4 long press at the same time
0xA1	Button 2 and button 5 long press at the same time
0xA2	Button 3 and button 4 long press at the same time
0xA3	Button 3 and button 5 long press at the same time
0xA4	Button 4 and button 5 long press at the same time
0xA5	Button 0 triple press
0xA6	Button 1 triple press
0xA7	Button 2 triple press
0xA8	Button 3 triple press
0xA9	Button 4 triple press
0xAA	Button 5 triple press

*Call State :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Standby (no talk)
0x01	Voice dial triggered
0x02	Incoming call
0x03	Outgoing call
0x04	Call active with single call
0x05	Single link with multi-call (1 active and 1 waiting)
0x06	Single link with multi-call (1 active and 1 hold)
0x07	Multiple link with multi-call (1 active and 1 waiting)
0x08	Multiple link with multi-call (1 active and 1 hold)

[\[Return to Command Table\]](#)

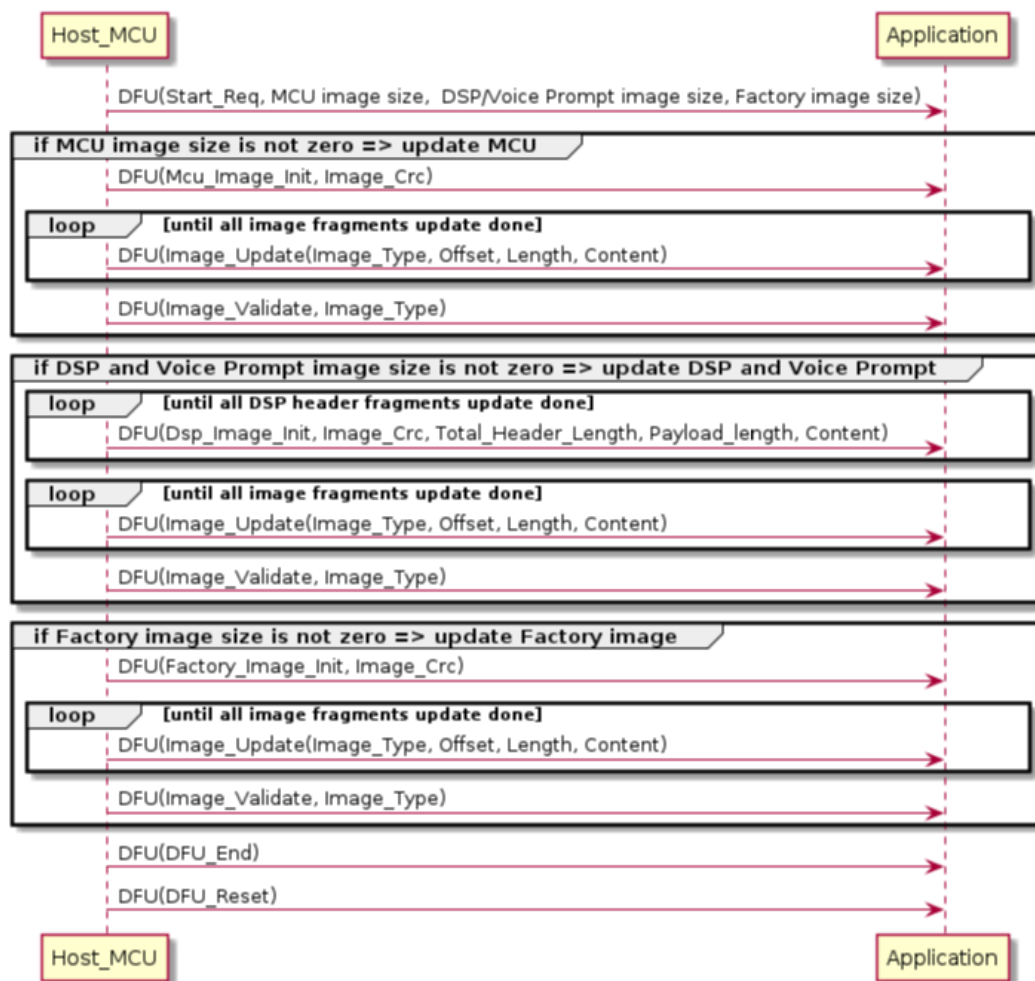
### 5.2.66 DFU (0x49)

Command	Op Code	Command Parameters	Return Event
DFU	0x49	Sub_Opcode, Parameters	

#### Description:

This command is used for Device Firmware Update. Images could be updated include MCU image, DSP image (with or without Voice Prompt) and factory configuration data image. Please note some operations (e.g. Image\_Validate) take a long time to finish, but due to it is not allowed to do other command while DFU is processing, so we would not ACK command immediately until these operations are done.

# Audio UART Command Set



## Precondition:

Device is under standby mode

## Command Parameters:

See following Sub-Opcode command format.

### 5.2.66.1 Start\_Req

Command	Sub-Opcode	Command Parameters	Return Event
Start_Req	0x00	Image_Size	

## Description:

This Sub-Opcode is used to setup size of all images request update. 4 bytes could be used for each image. If no setup image size, the corresponding image is skip update.

Please reference [DFU Image Parsing](#) for DFU image details.

# Audio UART Command Set

## Precondition:

None.

## Command Parameters:

*Image\_Size:*

*Length: 12 Bytes*

Value	Parameter Description
0XXXXXXXX	MCU image size (set as 0 if no update)
0YYYYYYYY	DSP and Voice Prompt image size (set as 0 if no update)
0ZZZZZZZZ	Factory configuration data image size (set as 0 if no update)

[\[Return to Command Table\]](#)

### 5.2.66.2 Mcu\_Image\_Init

Command	Sub-Opcode	Command Parameters	Return Event
Mcu_Image_Init	0x01	Image_Crc	

## Description:

This Sub-Opcode is used to setup CRC value of updating MCU image. Please reference [CRC calculation](#) for detail CRC value calculation guidance and reference [DFU Image Parsing](#) for DFU image details.

## Precondition:

None.

## Command Parameters:

*Image\_Crc:*

*Length: 2 Bytes*

Value	Parameter Description
0XXXXX	The CRC value of MCU image.

[\[Return to Command Table\]](#)

### 5.2.66.3 Dsp\_Image\_Init

Command	Sub-Opcode	Command Parameters	Return Event
Dsp_Image_Init	0x02	Image_Crc, STotal_Header_Length, Payload_Length, Payload	

# Audio UART Command Set

## Description:

This Sub-Opcode is used to setup CRC value and flash header Information of updating DSP image and Voice Prompt.

Please reference [CRC calculation](#) for detail CRC value calculation guidance and reference [DFU Image Parsing](#) for DFU image details.

## Precondition:

None.

## Command Parameters:

*Image\_Crc:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	The CRC value of DSP image and Voice Prompt.

*Total\_Header\_Length:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Total DSP Header Length

*Payload\_Length:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Payload Length in This Packet

*Payload:* *Length: N Bytes*

Value	Parameter Description
0xFFFF	The information blocks of DSP and Voice prompt updated to flash header

[\[Return to Command Table\]](#)

### 5.2.66.4 Factory\_Image\_Init

Command	Sub-Opcode	Command Parameters	Return Event
Factory_Image_Init	0x03	Image_Crc	

## Description:

This Sub-Opcode is used to setup CRC value of updating Factory configuration image. Please reference [CRC calculation](#) for detail CRC value calculation guidance and reference [DFU](#)

# Audio UART Command Set

[Image Parsing](#) for DFU image details.

## Precondition:

None.

## Command Parameters:

*Image\_Crc:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	The CRC value of Factory configuration image.

[\[Return to Command Table\]](#)

## 5.2.66.5 Image\_Update

Command	Sub-Opcode	Command Parameters	Return Event
Image_Update	0x04	Image_Type, Offset, Length, Content	

## Description:

This Sub-Opcode is used to send and executing image update.

## Precondition:

None.

## Command Parameters:

*Image\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Mcu image
0x01	Dsp image
0x02	Factory image

*Offset:*

*Length: 4 Bytes*

Value	Parameter Description
0xFFFFFFFF	The flash offset to start writing image fragment.

*Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFFFFFF	The length of image fragment to update, unit: byte.

## Audio UART Command Set

*Content:*

*Length: N Bytes*

Value	Parameter Description
0XXXXXXXX	Pointer to the image fragment.

[\[Return to Command Table\]](#)

### 5.2.66.6 Image\_Validate

Command	Sub-Opcode	Command Parameters	Return Event
Image_Validate	0x05	Image_Type	

#### Description:

This Sub-Opcode is used to validate the updating image by calculating CRC value from received image content and compare it with CRC value in image initialize Sub-Opcode command. Please note this operation takes a long time to finish, but due to it is not allowed to do other command while DFU is progressing, so we would not ACK command immediately until these operations are done.

#### Precondition:

None.

#### Command Parameters:

*Image\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Mcu image
0x01	Dsp image
0x02	Factory image

[\[Return to Command Table\]](#)

### 5.2.66.7 DFU\_End

Command	Sub-Opcode	Command Parameters	Return Event
DFU_End	0x06	None	

#### Description:

This Sub-Opcode is used to inform the update procedure is done. SDK can finalize the

## Audio UART Command Set

---

DFU procedure.

**Precondition:**

None.

**Command Parameters:**

None.

[\[Return to Command Table\]](#)

### 5.2.66.8 DFU\_Reset

Command	Sub-Opcode	Command Parameters	Return Event
DFU_Reset	0x07	None	

**Description:**

If the updated image(s) is validated and the procedure is ended successfully, the new image(s) is activated after system reboot.

**Precondition:**

None.

**Command Parameters:**

None.

[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.67 AVRCP\_Vendor\_Dependent\_Cmd (0x4A)

Command	Op Code	Command Parameters	Return Event
AVRCP_Vendor_Dependent_Cmd	0x4A	Data_Base_Index, PDU ID, Parameters	<a href="#">AVRCP_Vendor_Dependent_Rsp</a>

#### Description:

This command is used to trigger AVRCP Vendor Dependent Command to the remote device (TG role).

#### Precondition:

AVRCP link has been established.

#### Command Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*PDU ID:*

*Length: 1 Bytes*

Value	Parameter Description
0x20	GetElementAttributes Requests the TG to provide the attributes of the element specified in the parameter. Such as title, album name, artist name...etc.

#### 5.2.67.1 GetElementAttributes

Command	PDU ID	Command Parameters	Return Event
GetElementAttributes	0x20	Attribute_Count Attribute_List	<a href="#">AVRCP_Vendor_Dependent_Rsp</a>

#### Description:

This command is used to requests the TG to provide the attributes of the element specified in the parameter.

#### Precondition:

AVRCP link has been established.



# Audio UART Command Set

## Command Parameters:

*Attributes\_Num*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The number of attribute IDs in the following Attribute ID list.

*AttributeID\_List*

*Length: N Byte*

Value	Parameter Description
0XXXXXXXXX...	Attributes which are requested to be returned for each item returned. One attribute is 4 bytes. Therefore, the length of attribute list will be 4 * Attribute_Count bytes.

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No AVRCP connection exist
0x03	Parameter error	Incorrect parameter value
0x05	BTM Memory Full	OS heap memory is full

[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.68 Concert Mode Endless Grouping (0x4B)

Command	Opcode	Command Parameters	Return Event
Concert Mode Endless Grouping	0x4B	CSB Role, GAC Time, DAC Time	

#### Description:

This command is used to CSB endless grouping for Concert mode.

If GAC (General Access Code) time is valid, it is used to let Central add new Peripheral(s), The Central will periodically wait for new Peripheral(s) to join in the Concert mode in GAC period; If DAC (Dedicate Access Code) time is valid, it is used to let a Peripheral can link back to Central. the Central will periodically wait for Peripheral(s) in DAC period.

#### Precondition:

None.

#### Command Parameters:

*CSB Role:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	0: Peripheral 1: Central Range : 0~1

*GAC Time (unit: 5s):*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Setting GAC Time Range : 0~255 0x00: disable GAC 0xFF: 255*5 = 1275 sec.

*DAC Time (unit: 5s):*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Setting DAC Time Range : 0~255 0x00: disable DAC 0xFF: 255*5 = 1275 sec.

# Audio UART Command Set

[\[Return to Command Table\]](#)

## 5.2.69 Read Runtime Latency (0x4C)

Command	Op Code	Command Parameters	Return Event
Read Runtime Latency	0x4C	Latency_Type	<a href="#">Runtime_Latency</a>

### Description:

This command is used to read runtime latency

### Precondition:

None.

### Command Parameters:

*Latency\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Read A2DP output runtime latency
Others	Reserved

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	BTM is not playing
0x03	Parameter error	Parameter length incorrect or latency type not supported

[\[Return to Command Table\]](#)

## Audio UART Command Set

### 5.2.70 Toggle Audio Source (0xCC)

Command	Op Code	Command Parameters	Return Event
Toggle Audio Source	0xCC	Operation	

#### Description:

This command is used to toggle the audio source between Aux in and A2DP

#### Precondition:

None.

#### Command Parameters:

*Operation:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Bit 0: Toggle the audio source between Aux in and A2DP Bit 1~7 : Reserved

[\[Return to Command Table\]](#)

# Audio UART Command Set

## 6 MMI\_ACTION (0X02)

Command	Op Code	Command Parameters	Return Event
MMI_Action	0x02	data_base_index, action	

### Description:

MCU can send proper command to complete different kinds of action.

### Command Parameters:

*data\_base\_index:*

*Length: 1 Byte*

Value	Parameter Description
0xNN	database index of dedicate HF device bit0~2: data base index bit3~5: RFCOMM index if 2 SPP feature is enabled

### Action:

Action		Support version	
Value	Parameter Description	Start	End
<a href="#">0x01</a>	add/remove SCO link	V2.00	
<b>0x02</b>	force end active call	Deprecated	
<a href="#">0x03</a>	Enable device under test mode	V2.06	
<a href="#">0x04</a>	Accept an incoming call	V2.00	
<a href="#">0x05</a>	Reject an incoming call	V2.00	
<a href="#">0x06</a>	End call/ transfer audio to phone	V2.00	
<a href="#">0x07</a>	Toggle microphone on/off	V2.00	
<a href="#">0x08</a>	Mute microphone	V2.00	
<a href="#">0x09</a>	Active microphone	V2.00	
<a href="#">0x0A</a>	voice dial	V2.00	
<a href="#">0x0B</a>	cancel voice dial	V2.00	
<a href="#">0x0C</a>	last number redial	V2.00	
<a href="#">0x0D</a>	Set the active call on hold and active the hold call	V2.00	
<a href="#">0x0E</a>	switch voice between phone and headset	V2.00	
<a href="#">0x0F</a>	Query call list information(CLCC)	V2.00	
<a href="#">0x10</a>	three way call	V2.00	
<a href="#">0x11</a>	release the waiting call or on hold call	V2.00	
<a href="#">0x12</a>	accept the waiting call or active the on hold call and release the active call	V2.00	
<b>0x16</b>	initiate HF connection	Deprecated	
<a href="#">0x17</a>	disconnect HF link	V2.00	
<b>0x18</b>	Enable RX noise reduction when SCO ready		

## Audio UART Command Set

<b>0x19</b>	Disable RX noise reduction when SCO ready	
<b>0x1A</b>	Switch RX noise reduction when SCO ready	Deprecated
<b>0x1B</b>	Enable TX noise reduction when SCO ready	Deprecated
<b>0x1C</b>	Disable TX noise reduction when SCO ready	Deprecated
<b>0x1D</b>	Switch TX noise reduction when SCO ready	Deprecated
<a href="#"><u>0x1E</u></a>	Enable AEC when SCO ready	V2.00
<a href="#"><u>0x1F</u></a>	Disable AEC when SCO ready	V2.00
<a href="#"><u>0x20</u></a>	Switch AEC enable/disable when SCO ready	V2.00
<a href="#"><u>0x21</u></a>	Enable AEC RX noise reduction when SCO ready	V2.00
<a href="#"><u>0x22</u></a>	Disable AEC RX noise reduction when SCO ready	V2.00
<a href="#"><u>0x23</u></a>	Switch AEC RX noise reduction when SCO ready	V2.00
<a href="#"><u>0x24</u></a>	increase microphone gain	V2.00
<a href="#"><u>0x25</u></a>	decrease microphone gain	V2.00
<a href="#"><u>0x26</u></a>	switch primary HF device and secondary HF device role	V2.00
<b>0x30</b>	increase speaker gain	Deprecated
<b>0x31</b>	decrease speaker gain	Deprecated
<b>0x32</b>	Play/Pause music	Deprecated
<b>0x33</b>	Stop music	Deprecated
<b>0x34</b>	Next song	Deprecated
<b>0x35</b>	Previous song	Deprecated
<b>0x36</b>	Fast forward	Deprecated
<b>0x37</b>	Rewind	Deprecated
<b>0x38</b>	EQ mode up	Deprecated
<b>0x39</b>	EQ mode down	Deprecated
<a href="#"><u>0x3A</u></a>	Lock button	V2.00
<a href="#"><u>0x3B</u></a>	Disconnect A2DP link	V2.00
<a href="#"><u>0x3C</u></a>	next audio effect	V2.00
<a href="#"><u>0x3D</u></a>	previous audio effect	V2.00
<b>0x3E</b>	Toggle 3D effect	Deprecated
<a href="#"><u>0x3F</u></a>	report current EQ mode	V2.00
<a href="#"><u>0x40</u></a>	report current audio effect status	V2.00
<a href="#"><u>0x41</u></a>	Toggle audio playback	V2.06
<b>0x50</b>	enter pairing mode (from power off state)	Deprecated
<a href="#"><u>0x51</u></a>	power on button press	V2.00
<a href="#"><u>0x52</u></a>	power on button release	V2.00
<a href="#"><u>0x53</u></a>	power off button press	V2.00
<a href="#"><u>0x54</u></a>	power off button release	V2.00
<b>0x55</b>	Reserved	V2.00
<a href="#"><u>0x56</u></a>	Reset some EEPROM setting to default setting	V2.00

## Audio UART Command Set

<a href="#"><u>0x57</u></a>	Force speaker gain toggle	V2.00
<a href="#"><u>0x58</u></a>	Toggle button indication	V2.00
<a href="#"><u>0x59</u></a>	Combine function 0	V2.00
<a href="#"><u>0x5A</u></a>	Combine function 1	V2.00
<a href="#"><u>0x5B</u></a>	Combine function 2	V2.00
<a href="#"><u>0x5C</u></a>	Combine function 3	V2.00
<a href="#"><u>0x5D</u></a>	fast enter pairing mode (from non-off mode)	V2.00
<a href="#"><u>0x5E</u></a>	Switch power OFF	V2.00
<a href="#"><u>0x5F</u></a>	Disable LED	V2.00
<a href="#"><u>0x60</u></a>	Toggle buzzer	V2.00
<a href="#"><u>0x61</u></a>	Disable buzzer	V2.00
<a href="#"><u>0x62</u></a>	Enable buzzer	V2.00
<a href="#"><u>0x63</u></a>	Change tone set (SPK module support two sets of tone)	V2.00
<a href="#"><u>0x64</u></a>	Retrieve phonebook	Deprecated
<a href="#"><u>0x65</u></a>	Retrieve MCH	Deprecated
<a href="#"><u>0x66</u></a>	Retrieve ICH	Deprecated
<a href="#"><u>0x67</u></a>	Retrieve OCH	Deprecated
<a href="#"><u>0x68</u></a>	Retrieve CCH	Deprecated
<a href="#"><u>0x69</u></a>	Cancel access PBAP	Deprecated
<a href="#"><u>0x6A</u></a>	Indicate battery status	V2.00
<a href="#"><u>0x6B</u></a>	Exit pairing mode	V2.00
<a href="#"><u>0x6C</u></a>	link last device	Deprecated
<a href="#"><u>0x6D</u></a>	disconnect all link	Deprecated
<a href="#"><u>0x6E</u></a>	OHS event 1	Deprecated
<a href="#"><u>0x6F</u></a>	OHS event 2	Deprecated
<a href="#"><u>0x70</u></a>	OHS event 3	Deprecated
<a href="#"><u>0x71</u></a>	OHS event 4	Deprecated
<a href="#"><u>0x72</u></a>	SHS_SEND_USER_DATA_1 (for embedded application mode)	V2.00
<a href="#"><u>0x73</u></a>	SHS_SEND_USER_DATA_2 (for embedded application mode)	V2.00
<a href="#"><u>0x74</u></a>	SHS_SEND_USER_DATA_3 (for embedded application mode)	V2.00
<a href="#"><u>0x75</u></a>	SHS_SEND_USER_DATA_4 (for embedded application mode)	V2.00
<a href="#"><u>0x76</u></a>	SHS_SEND_USER_DATA_5 (for embedded application mode)	V2.00
<a href="#"><u>0x77</u></a>	report current RX NR status	V2.00
<a href="#"><u>0x78</u></a>	report current TX NR status	V2.00
<a href="#"><u>0x79</u></a>	force buzzer alarm	Deprecated
<a href="#"><u>0x7A</u></a>	Cancel all BT paging	V2.00
<a href="#"><u>0x7B</u></a>	OHS event 5	Deprecated
<a href="#"><u>0x7C</u></a>	OHS event 6	Deprecated
<a href="#"><u>0x7D</u></a>	Disconnect SPP link	V2.00
<a href="#"><u>0x80</u></a>	Enable A2DP mix Line-In	V2.07

## Audio UART Command Set

<a href="#">0x81</a>	Disable A2DP mix Line-In	V2.07
<a href="#">0x82</a>	Increase Line-In input gain	V2.07
<a href="#">0x83</a>	Decrease Line-In input gain	V2.07
<a href="#">0xC0</a>	OHS event 7 (for Unlimiter project)	Deprecated
<a href="#">0xC1</a>	OHS event 8 (for Unlimiter project)	Deprecated
<a href="#">0xC2</a>	OHS event 9 (for Unlimiter project)	Deprecated
<a href="#">0xC3</a>	OHS event 10 (for Unlimiter project)	Deprecated
<a href="#">0xC4</a>	OHS event 11 (for Unlimiter project)	Deprecated
<a href="#">0xC5</a>	OHS event 12 (for Unlimiter project)	Deprecated
<a href="#">0xC6</a>	OHS event 13 (for Unlimiter project)	Deprecated
<a href="#">0xC7</a>	OHS event 14 (for Unlimiter project)	Deprecated
<a href="#">0xC8</a>	OHS event 15 (for Unlimiter project)	Deprecated
<a href="#">0xC9</a>	OHS event 16 (for Unlimiter project)	Deprecated
<a href="#">0xCA</a>	OHS event 17 (for Unlimiter project)	Deprecated
<a href="#">0xCB</a>	Switch DSP mode 2 or 3 (for Unlimiter project)	Deprecated
<a href="#">0xE0</a>	Trigger MSPK Central	V2.00
<a href="#">0xE1</a>	Trigger MSPK Peripheral	V2.00
<a href="#">0xE2</a>	MSPK one key connect/disconnect	V2.00
<a href="#">0xE3</a>	Cancel MSPK creation	V2.00
<a href="#">0xE4</a>	Terminate MSPK link	V2.00
<a href="#">0xE5</a>	Terminate / Cancel MSPK connection	V2.00
<a href="#">0xE6</a>	MSPK Central enter Aux-in 44.1K PCM Encoder mode	V2.00
<a href="#">0xE7</a>	MSPK Central enter Aux-in 48K PCM Encoder mode	V2.00
<a href="#">0xE8</a>	MSPK Central exit Aux-in PCM Encoder mode	V2.00
<a href="#">0xE9</a>	MSPK Central enter Aux-in SBC Encoder mode	V2.00
<a href="#">0xEA</a>	MSPK Central exit Aux-in SBC Encoder mode	Deprecated
<a href="#">0xEB</a>	MSPK dynamic creation	Deprecated
<a href="#">0xEC</a>	MSPK switch channel	V2.00
<a href="#">0xED</a>	MSPK power off all speakers	V2.00
<a href="#">0xEE</a>	MSPK AFH SBCENCODING AUDIOSYNC	V2.00
<a href="#">0xEF</a>	MSPK ERASE CONCERT MODE RECORD	V2.08
<a href="#">0xF0</a>	MSPK CENTRAL PAGE PERIPHERAL FOR NEW PERIPHERAL	Deprecated
<a href="#">0xF1</a>	MSPK PERIPHERAL ENABLE PAGE SCAN FOR NEW CENTRAL	Deprecated
<a href="#">0xF2</a>	MSPK PERIPHERAL USE SLOW PAGE SCAN	Deprecated
<a href="#">0xF3</a>	MSPK PERIPHERAL USE FAST PAGE SCAN	Deprecated
<a href="#">0xF4</a>	MSPK_ENTER_STEREO_MODE	V2.00
<a href="#">0xF5</a>	MSPK_ENTER_CONCERT_MODE	V2.00
<a href="#">0xF6</a>	MSPK_ADD_THIRD_SPK	V2.00
<a href="#">0xF7</a>	MSPK_SOUND_SYNCHRONIZATION	V2.00
<a href="#">0xF8</a>	MSPK_CSB_CONNECTED_MODE_SWITCH	V2.00
<a href="#">0xF9</a>	MSPK back to last mode	V2.00



## Audio UART Command Set

<a href="#">0xFA</a>	MSPK one key connect/disconnect with Link back immediately	V2.02
<a href="#">0xFB</a>	MSPK_ONE_KEY_OPERATION_STEREO_MODE	V2.04
<a href="#">0xFC</a>	MSPK_ONE_KEY_OPERATION_CONCERT_MODE	V2.04

### Action 0x01:

Value	Parameter Description
0x01	add/remove SCO link

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to create a SCO link if the ACL link exists and no SCO connection.

And it also can disconnect the SCO link if the SCO link exists.

[\[Return to Action Table\]](#)

### Action 0x03:

Value	Parameter Description
0x03	Enable device under test mode

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	Device not under pairing mode Feature disable in configuration

Description:

This action is used to place device under test mode.

[\[Return to Action Table\]](#)

### Action 0x04:

Value	Parameter Description
0x04	Accept an incoming call

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No incoming call on going

## Audio UART Command Set

---

Description:

This action is used to answer the incoming call.

[\[Return to Action Table\]](#)

### Action 0x05:

Value	Parameter Description
0x05	Reject an incoming call

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No incoming call on going

Description:

This action is used to reject the incoming call.

[\[Return to Action Table\]](#)

### Action 0x06:

Value	Parameter Description
0x06	1. End call if SCO exist. 2. Voice transfer to headset if SCO not exist.

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No Call active No outgoing call on going

Description:

This action is used to hang-up the active call if outgoing call ongoing or SCO exist.

It also can transfer the voice to headset if SCO not exist.

If device supports 3-way call and there is on hold or wait call, this action is able to disconnect all the active call and keep the on hold or wait call.

[\[Return to Action Table\]](#)

# Audio UART Command Set

## Action 0x07:

Value	Parameter Description
0x07	1. Mute microphone if microphone is not mute 2. Active microphone if microphone is mute

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No Call active No SCO connection

Description:

This action is used to mute or active microphone while CALL active or SCO exists.

[\[Return to Action Table\]](#)

## Action 0x08:

Value	Parameter Description
0x08	Mute microphone

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No Call active No outgoing call on going

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No Call active No SCO connection Microphone is mute

Description:

This action is used to mute microphone while CALL active or SCO exists.

[\[Return to Action Table\]](#)

## Action 0x09:

Value	Parameter Description
0x09	Un-mute microphone

Return error:

Length: 1 Byte

Value	Description	Condition
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## Audio UART Command Set

0x01	Command disallow	No HF connection No Call active No SCO connection Microphone is unmute
------	------------------	---------------------------------------------------------------------------------

Description:

This action is used to unmute microphone while CALL active or SCO exists.

[\[Return to Action Table\]](#)

### Action 0x0A:

Value	Parameter Description
0x0A	Voice dial

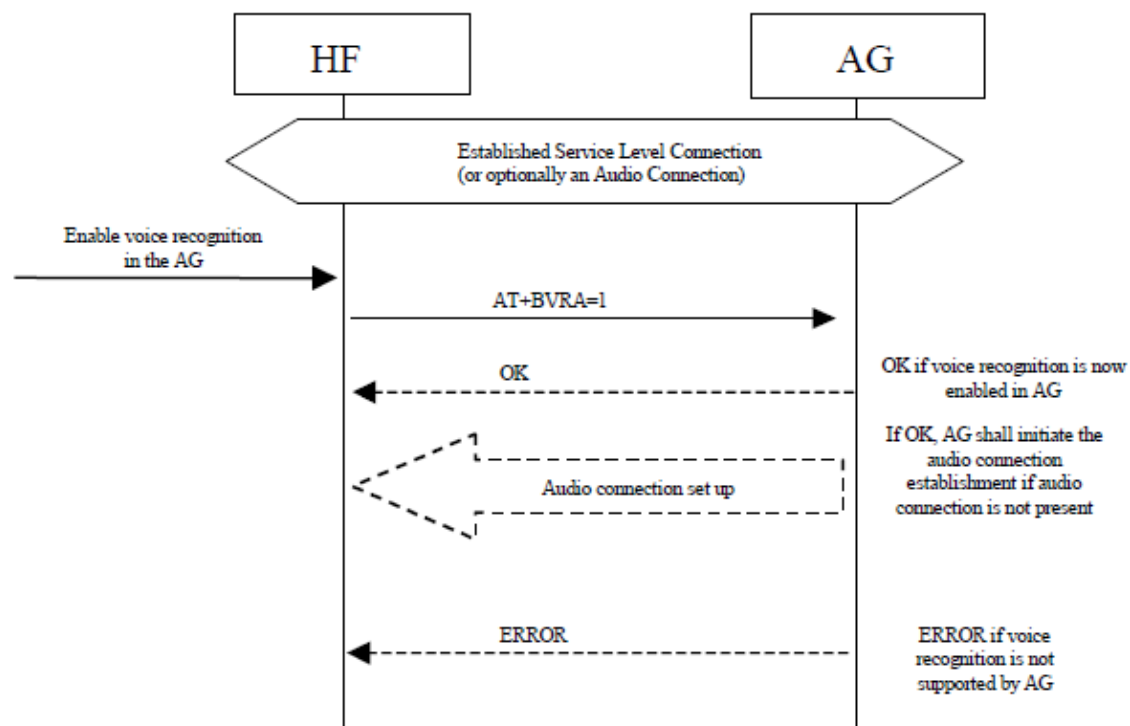
Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	Not support Voice recognition Already has active call.

Description:

This action is used to activate voice dial if HF is connected. If there is no HF connection, it initiates the HF connection and activate the voice recognition application (ex: Siri)



[\[Return to Action Table\]](#)

# Audio UART Command Set

## Action 0x0B:

Value	Parameter Description
0x0B	Cancel voice dial

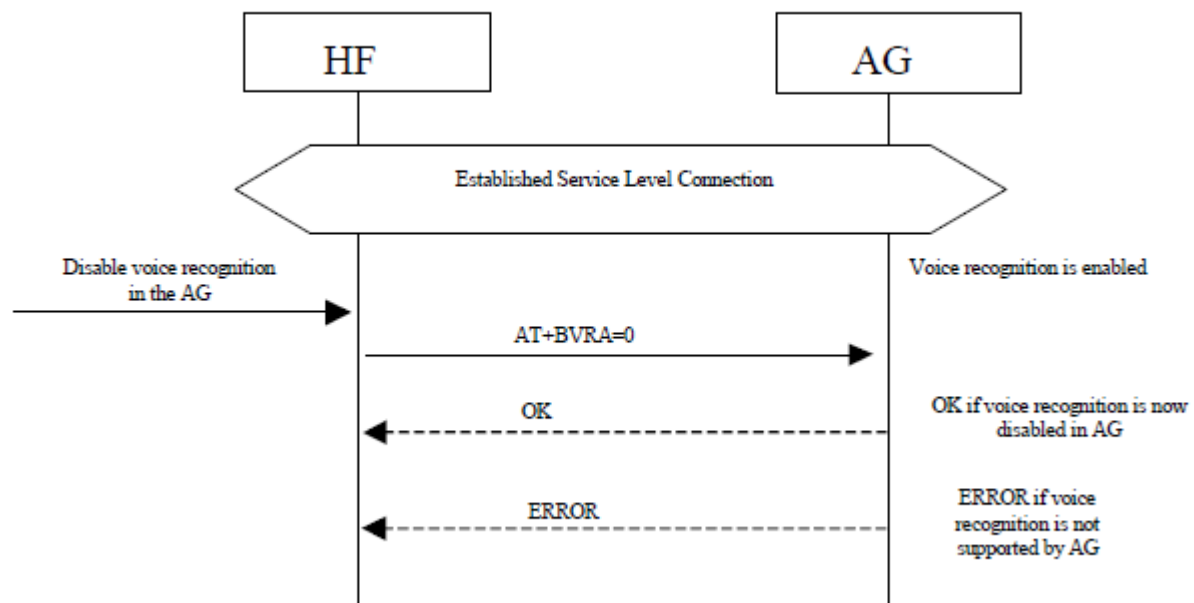
Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No Voice call No activation Voice call ongoing.

Description:

This action is used to deactivate voice dial if HF is connected.



[\[Return to Action Table\]](#)

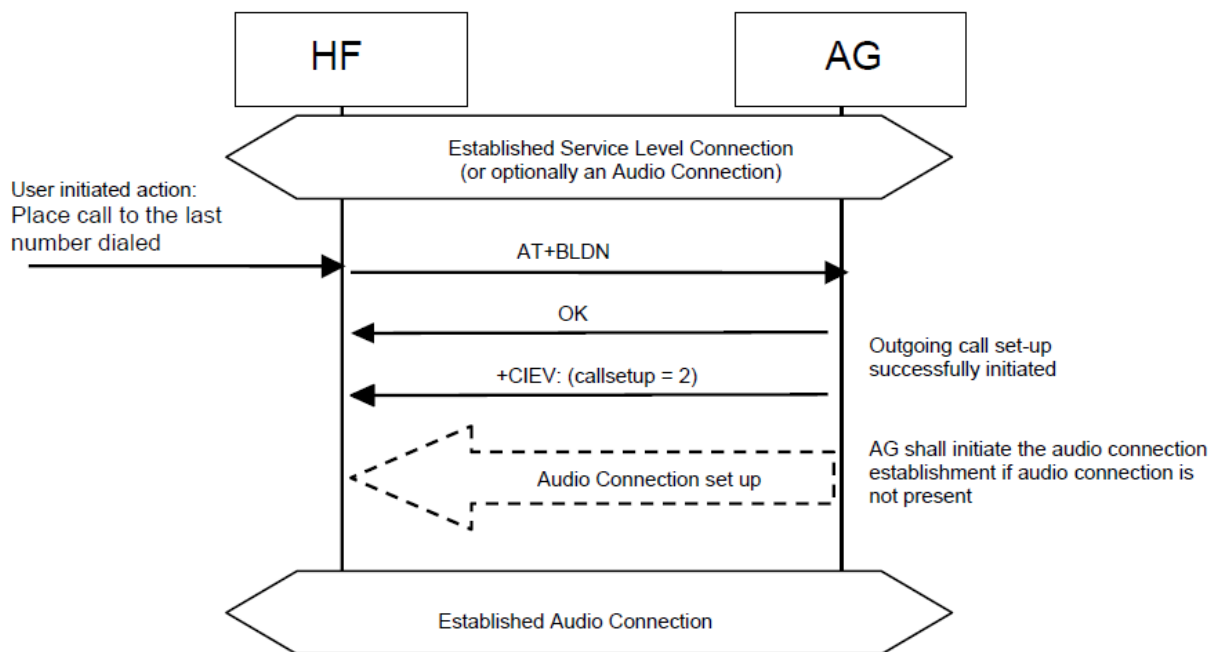
## Action 0x0C:

Value	Parameter Description
0x0C	Last number redial

Description:

This action is used to redial the last number if HF is connected. If there is no HF connection, it initiates the HF connection first and active last number redial.

## Audio UART Command Set



[\[Return to Action Table\]](#)

### Action 0x0D:

Value	Parameter Description
0x0D	Set the active call on hold and active the hold call

Return error:

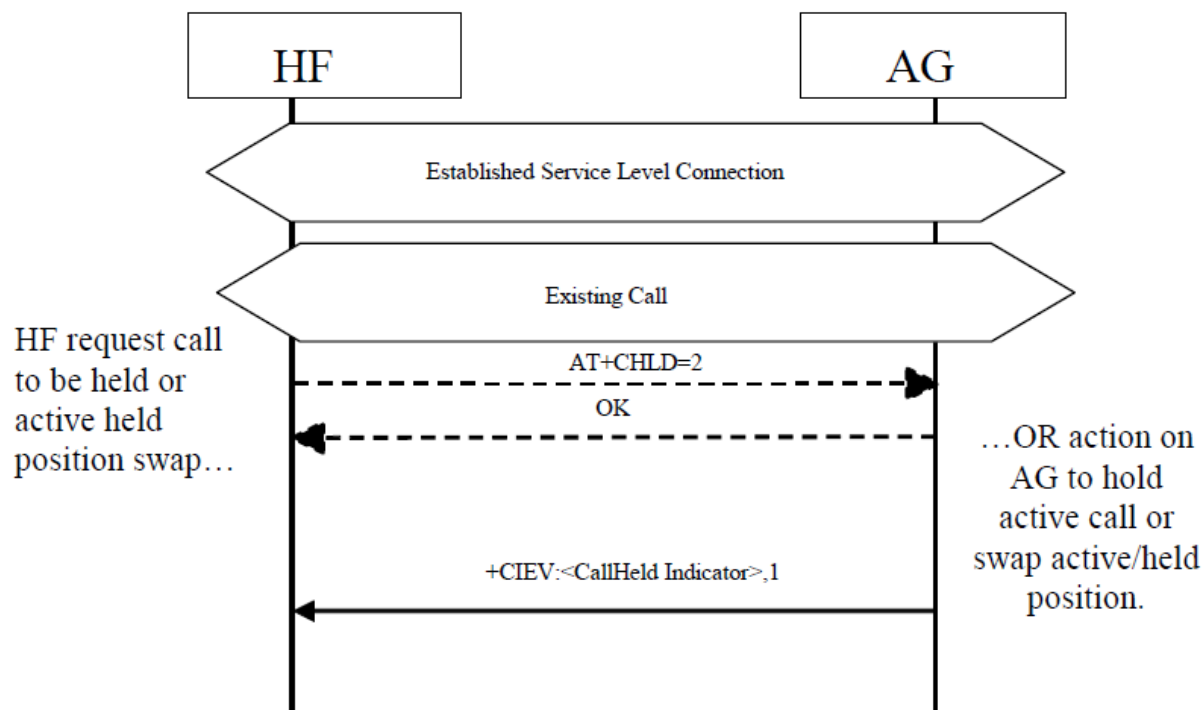
Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection Not support 3-way calling No active call while Call on hold and outgoing call ongoing.

Description:

This action is used to swap the active/held call position. If cell phone doesn't support 3-way calling, it hangs up the call.

## Audio UART Command Set



[\[Return to Action Table\]](#)

### Action 0x0E:

Value	Parameter Description
0x0E	voice transfer

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No SCO connection existing. No active call. No outgoing call ongoing.

Description:

This action is used to switch voice between phone and headset. If HF isn't connected, SPK create the HF connection.

[\[Return to Action Table\]](#)

### Action 0x0F:

Value	Parameter Description
0x0F	trigger SPK Module to query call list information

Return error:

Length: 1 Byte

Value	Description	Condition
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# Audio UART Command Set

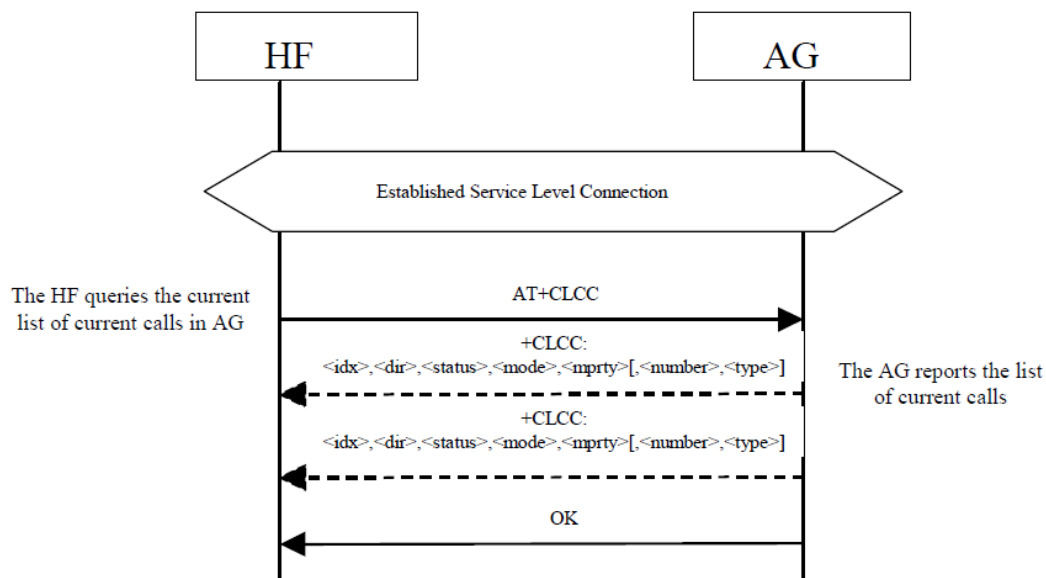
0x01

Command disallow

No HF connection

Description:

The HF shall execute this procedure to query the list of current calls in AG. Refer to section 7.18[1] and section 4.31.1[3].



[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][...]]

**<idx>** Call identification number

**<dir>**

0:Mobile originated (MO) call

1:Mobile originated (MT) call

**<state>** State of the call

0:ACTIVE

1:HELD

2: Dialing (MO)

3: Alerting (MO)

4: Incoming (MT)

5: Waiting (MT)

**<mode>**

0: Voice

1: Data

2: Fax

3: Voice followed by data, voice mode

4: Alternating voice/data, voice mode

5: Alternating voice/fax, voice mode

6: Voice followed by data, data mode



## Audio UART Command Set

7: Alternating voice/data, data mode

8: Alternating voice/fax, fax mode

9: Unknown

<empty>

0: Call is not one of multiparty (conference) call parties

1: Call is one of multiparty (conference) call parties

[\[Return to Action Table\]](#)

### Action 0x10:

Value	Parameter Description
0x10	Three way call

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to add a held call into the conference if the device/operator supports 3 way call feature.

[\[Return to Action Table\]](#)

### Action 0x11:

Value	Parameter Description
0x11	Release the waiting call or on hold call

Return error:

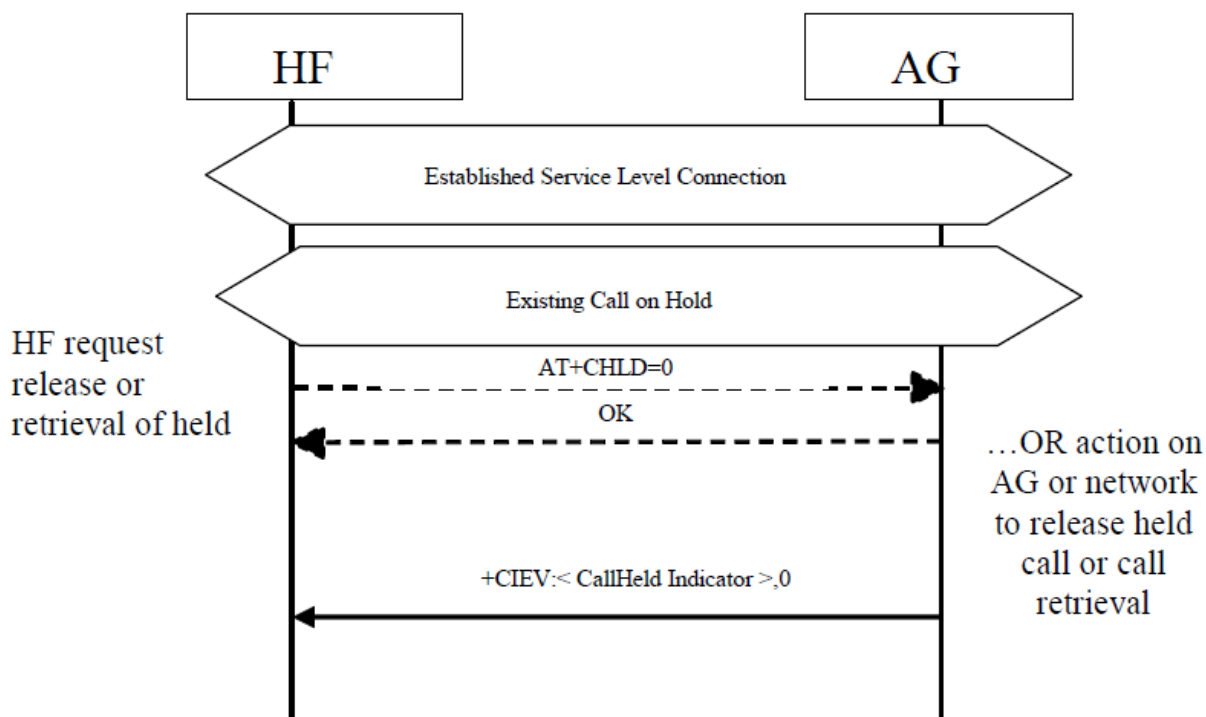
Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to release all held call.

## Audio UART Command Set



[\[Return to Action Table\]](#)

### Action 0x12:

Value	Parameter Description
0x12	Accept the waiting call or active the on hold call and release the active call

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to release active call and accept the waiting/held call if the device supports 3 way calls.

[\[Return to Action Table\]](#)

### Action 0x17:

Value	Parameter Description
0x17	disconnect HF link

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

## Audio UART Command Set

No ACL connection and no HF/HS connected profile

Description:

This action is used to disconnect HF connection.

[\[Return to Action Table\]](#)

### ~~Action 0x1E:~~

Value	Parameter Description
0x1E	Enable AEC when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC

Description:

This action is used to enable AEC.

[\[Return to Action Table\]](#)

### ~~Action 0x1F:~~

Value	Parameter Description
0x1F	Disable AEC when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC

Description:

This action is used to disable AEC.

[\[Return to Action Table\]](#)

### ~~Action 0x20:~~

Value	Parameter Description
0x20	Switch AEC when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC

## Audio UART Command Set

Description:

This action is used to switch AEC.

[\[Return to Action Table\]](#)

### Action 0x21:

Value	Parameter Description
0x21	Enable AEC and RX noise reduction when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC

Description:

This action is used to enable AEC and RX noise reduction.

[\[Return to Action Table\]](#)

### Action 0x22:

Value	Parameter Description
0x22	Disable AEC and RX noise reduction when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC/NR

Description:

This action is used to disable AEC and RX noise reduction.

[\[Return to Action Table\]](#)

### Action 0x23:

Value	Parameter Description
0x23	Switch AEC and RX noise reduction when SCO ready

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection No SCO connection and DSP not support AEC/NR

Description:

## Audio UART Command Set

This action is used to switch AEC and RX noise reduction.

[\[Return to Action Table\]](#)

### Action 0x24:

Value	Parameter Description
0x24	Volume up the microphone gain

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to volume up the microphone gain.

[\[Return to Action Table\]](#)

### Action 0x25:

Value	Parameter Description
0x25	Volume down the microphone gain

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to volume down the microphone gain.

[\[Return to Action Table\]](#)

### Action 0x26:

Value	Parameter Description
0x26	switch primary HF device and secondary HF device role

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No HF connection

Description:

This action is used to switch the primary/secondary HF device role when SPK supports multiple connections. .

[\[Return to Action Table\]](#)

## Audio UART Command Set

### Action 0x3A:

Value	Parameter Description
0x3A	Lock button

Description:

This action is used to lock system.

[\[Return to Action Table\]](#)

### Action 0x3B:

Value	Parameter Description
0x3B	Disconnect A2DP link

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No ACL connection No A2DP connected

Description:

This action is used to disconnect A2DP connection.

[\[Return to Action Table\]](#)

### Action 0x3C:

Value	Parameter Description
0x3C	Next audio effect

Description:

This action is used to switch to next audio effect.

[\[Return to Action Table\]](#)

### Action 0x3D:

Value	Parameter Description
0x3D	Previous audio effect

Description:

This action is used to switch to previous audio effect.

[\[Return to Action Table\]](#)

### Action 0x3F:

Value	Parameter Description

## Audio UART Command Set

0x3F	Report current EQ mode
------	------------------------

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	DSP doesn't support EQ mode

Description:

This action is used to report current EQ mode. If embedded mode enable, current EQ status report via SPP connection.

[\[Return to Action Table\]](#)

### Action 0x40:

Value	Parameter Description
0x40	Report current audio effect status

Description:

This action is used to report current audio effect status. If embedded mode enable, current audio effect status report via SPP connection.

Note: This Action is not supported in MSPK2 and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x41:

Value	Parameter Description
0x41	Toggle audio playback

Description:

This action is used to toggle audio playback when two speakers are connected in audio transceiver Tx mode and when multilink is disabled.

Note: This Action is only supported in Audio Transceiver. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

## Audio UART Command Set

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### *Action 0x51:*

Value	Parameter Description
0x51	Power on button press

Description:

This action is used to press power on button.

[\[Return to Action Table\]](#)

### *Action 0x52:*

Value	Parameter Description
0x52	Power on button release

Description:

This action is used to release power on button.

[\[Return to Action Table\]](#)

### *Action 0x53:*

Value	Parameter Description
0x53	Power off button press

Description:

This action is used to press power off button.

[\[Return to Action Table\]](#)

### *Action 0x54:*

Value	Parameter Description
0x54	Power off button release

Description:

This action is used to release power off button.

[\[Return to Action Table\]](#)

### *Action 0x55:*

Value	Parameter Description
0x55	Reverse panel

Description:

This action is used to release reverse panel.



# Audio UART Command Set

[\[Return to Action Table\]](#)

## Action 0x56:

Value	Parameter Description
0x56	Reset some EEPROM setting to default value

Description:

This action is used to reset some EEPROM setting to default value.

Device_List_Table	Erase the device table: 0x00
linked_priority	Erase the linked priority: 0x00
mic_gain_level	Microphone gain: 0XDD
device_speaker_gain	Speaker gain : 0x99
device_absolute_volume	Absolute volume: 0x99
app_function_status	buzzer status : OFF BT_STABDBY_MODE_BIT: keep the speaker connectable in power off state. disabled VOL_CTRL_DIRECT_BIT: circular volume control direction. 0: volume up when volume control
hf_device_index	Record HF primary device index: 0xFF
a2dp_device_index	Record A2DP device: 0xFF
line_in_gain_level	Line-in gain: 0x99
CSB_DIAC	The access code for dedicate CSB pairing: 0x00000000
CSB_Trigger_Sync_Role_Setting	Sync role setting: 0x00
MSPK_channel	MSPK channel: 0x21

[\[Return to Command Table\]](#)

## Action 0x57:

Value	Parameter Description
0x57	Force speaker gain toggle

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No Call exist

Description:

This action is used to release power off button.

Note: This Action is not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

# Audio UART Command Set

[\[Return to Action Table\]](#)

## Action 0x58:

Value	Parameter Description
0x58	Toggle button indication

Description:

This action is used to toggle button indication depends on the setting of EEPROM output\_indication\_table.

output\_indication\_table[0] : indication GPIO0

output\_indication\_table[1] : indication GPIO1

[\[Return to Action Table\]](#)

## Action 0x59~0x5C:

Value	Parameter Description
0x59	Combine function 0
0x5A	Combine function 1
0x5B	Combine function 2
0x5C	Combine function 3

Description:

Those 4 actions are used to trigger combine function 0~3.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

## Action 0x5D:

Value	Parameter Description
0x5D	fast enter pairing mode (from non-off mode)

data\_base\_index:

*Length: 1 Byte*

Value	Parameter Description
0x00	BTM generate tone when enter pairing mode
Others	BTM doesn't generate tone when enter pairing mode

*Return error:*

*Length: 1 Byte*

## Audio UART Command Set

Value	Description	Condition
0x01	Command disallow	SPK is in OFF state

Description:

This action is used to enter pairing mode from non-off mode.

[\[Return to Action Table\]](#)

### Action 0x5E:

Value	Parameter Description
0x5E	switch power off

Description:

This action is used to execute the power off process. If MSPK is connected, this action is used to disconnect the remote MSPK first then MCU receive EVENT [BTM Utility Rsp](#) (0x1B) with action\_type 0x05.

After receive the event, MCU can send MMI\_Action [0x53](#), [0x54](#) to power off current SPK.

If it's a standalone SPK, this action executes the power off directly.

[\[Return to Action Table\]](#)

### Action 0x5F:

Value	Parameter Description
0x5F	Disable LED

Description:

This action is used to disable LED.

Note: This Action is not supported in MSPK2 and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x60:

Value	Parameter Description
0x60	Toggle buzzer

Description:

This action is used to toggle buzzer if Buzzer function implement.

## Audio UART Command Set

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Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x61:

Value	Parameter Description
0x61	Disable buzzer

Description:

This action is used to disable buzzer if Buzzer function implement.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x62:

Value	Parameter Description
0x62	Enable buzzer

Description:

This action is used to enable buzzer if Buzzer function implement.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x63:

Value	Parameter Description
0x63	Switch to next support ringtone language set.

Description:

This action is used to switch to next support ringtone language set.

Note: These Actions are not supported in IS2066\_206 WST and IS2066\_207 WST, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

## Audio UART Command Set

### Action 0x64 ~ 0x69:

Value	Parameter Description
0x64	Retrieve phonebook
0x65	Retrieve MCH
0x66	Retrieve ICH
0x67	Retrieve OCH
0x68	Retrieve CCH
0x69	Cancel access PBAP

Description:

This action is used to access phone book if it supports PBAP. Those actions only support in some firmware.

[\[Return to Action Table\]](#)

### Action 0x6A:

Value	Parameter Description
0x6A	Indicate battery status

Description:

This action is used to indicate battery (high, medium, low) status via voice prompt if device support voice prompt report battery status feature or LED indication.

[\[Return to Action Table\]](#)

### Action 0x6B:

Value	Parameter Description
0x6B	Exit pairing mode

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	SPK is in pairing mode/ SPP connection existing SPK has A2DP connection/HF HS connection if device support social mode.

Description:

This action is used to exit pairing mode.

[\[Return to Action Table\]](#)

### Action 0x72~0x76:

Value	Parameter Description
0x72	SHS_SEND_USER_DATA_1 (for embedded application mode)

## Audio UART Command Set

0x73	SHS_SEND_USER_DATA_2 (for embedded application mode)
0x74	SHS_SEND_USER_DATA_3 (for embedded application mode)
0x75	SHS_SEND_USER_DATA_4 (for embedded application mode)
0x76	SHS_SEND_USER_DATA_5 (for embedded application mode)

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Embedded mode disable

Description:

Those 5 actions are used to handle user MMI data if device support Embedded SPP function.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x77:

Value	Parameter Description
0x77	Report current RX NR status

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	DSP not support NR mode

Description:

This action is used to report current RX NR status.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x78:

Value	Parameter Description
0x78	Report current TX NR status

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	DSP not support NR mode

## Audio UART Command Set

Description:

This action is used to report current TX NR status.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0x7A:

Value	Parameter Description
0x7A	Cancel all BT paging

Description:

This action is used to cancel BT paging.

[\[Return to Action Table\]](#)

### Action 0x7D:

Value	Parameter Description
0x7D	Disconnect SPP link

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	No ACL connection No SPP profile connected

Description:

This action is used to disconnect SPP link.

[\[Return to Action Table\]](#)

### Action 0x80:

Value	Parameter Description
0x80	Enable A2DP mix Line-In

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state is not IDLE Mix feature is already enable Mix configuration is disable

Description:

## Audio UART Command Set

This action is used to enable A2DP mix Line-In feature.

[\[Return to Action Table\]](#)

### Action 0x81:

Value	Parameter Description
0x81	Disable A2DP mix Line-In

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state is not IDLE Mix feature is already disable Mix configuration is disable

Description:

This action is used to disable A2DP mix Line-In feature.

[\[Return to Action Table\]](#)

### Action 0x82:

Value	Parameter Description
0x82	Increase Line-In input gain

Description:

This action is used to increase Line-In input gain.

[\[Return to Action Table\]](#)

### Action 0x83:

Value	Parameter Description
0x83	Decrease Line-In input gain

Description:

This action is used to decrease Line-In input gain.

[\[Return to Action Table\]](#)

### Action 0xE0:

Value	Parameter Description
0xE0	Trigger MSPK Central



## Audio UART Command Set

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Call active Line-in/Aux-in CSB mode disable

Description:

This action is used to enter MSPK Central mode. You can select Concert mode or Stereo mode (F4 or F5) before using this command.

[\[Return to Action Table\]](#)

### Action 0xE1:

Value	Parameter Description
0xE1	Trigger MSPK Peripheral

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Call active Line-in/Aux-in CSB mode disable

Description:

This action is used to enter MSPK Peripheral mode. You can select Concert mode or Stereo mode (F4 or F5) before using this command.

[\[Return to Action Table\]](#)

### Action 0xE2:

Value	Parameter Description
0xE2	MSPK one key connect/disconnect

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Call active Line-in/Aux-in CSB mode disable CSB state doesn't under "Connecting", "Connected" or "Add 3 <sup>rd</sup> SPK"

Description:

This action is used for MSPK one key connect/disconnect, which only need one key/button to perform this action.

[\[Return to Action Table\]](#)

## Audio UART Command Set

### Action 0xE3:

Value	Parameter Description
0xE3	Cancel MSPK create connection

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under "Connecting", "Connected" or "Add 3 <sup>rd</sup> SPK"

Description:

This action is used to cancel MSPK create connection.

[\[Return to Action Table\]](#)

### Action 0xE4:

Value	Parameter Description
0xE4	Terminate MSPK link

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under "Connected" or "Add 3 <sup>rd</sup> SPK"

Description:

This action is used to terminate MSPK link.

[\[Return to Action Table\]](#)

### Action 0xE5:

Value	Parameter Description
0xE5	Terminate / Cancel MSPK connection

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under "Connecting", "Connected", "Wait to create CSB link" or "Add 3 <sup>rd</sup> SPK"

Description:

This action is used to terminate/cancel MSPK connection.

[\[Return to Action Table\]](#)

### Action 0xE6:

Value	Parameter Description
-------	-----------------------

## Audio UART Command Set

0xE6	MSPK Central enter Aux-in 44.1K PCM Encoder mode
------	--------------------------------------------------

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used for MSPK Central enter AUX-IN 44.1K PCM encoder mode.

[\[Return to Action Table\]](#)

### Action 0xE7:

Value	Parameter Description
0xE7	MSPK Central enter Aux-in 48K PCM Encoder mode

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used for MSPK Central enter AUX-IN 48K PCM encoder mode.

[\[Return to Action Table\]](#)

### Action 0xE8:

Value	Parameter Description
0xE8	MSPK Central exit Aux-in PCM Encoder mode

Description:

This action is used for MSPK Central exit AUX-IN PCM encoder mode.

[\[Return to Action Table\]](#)

### Action 0xE9:

Value	Parameter Description
0xE9	MSPK Central enter Aux-in SBC Encoder mode

*Return error:*

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used for MSPK Central enter AUX-IN SBC encoder mode.

## Audio UART Command Set

[\[Return to Action Table\]](#)

Action 0xEC:

Value	Parameter Description
0xEC	MSPK switch channel

Description:

This action is used for MSPK switch channel.

[\[Return to Action Table\]](#)

### *Action 0xED:*

Value	Parameter Description
0xED	MSPK power off all speakers

Description:

This action is used to execute the power off process. If MSPK is connected, this action is used to disconnect the remote MSPK first then MCU receive EVENT [BTM Utility Rsp](#) (0x1B) with action\_type 0x05.

After receive the event, MCU can send MMI\_Action [0x53](#), [0x54](#) to power off current SPK.

[\[Return to Action Table\]](#)

### *Action 0xEE:*

Value	Parameter Description
0xEE	MSPK AFH SBC ENCODING AUDIO SYNC

Description:

This action is used for MSPK AFH SBC encoding audio sync.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### *Action 0xEF:*

Value	Parameter Description
0xEF	MSPK ERASE CONCERT MODE RECORD

Description:

This action is used for MSPK ERASE CONCERT MODE RECORD.

## Audio UART Command Set

[\[Return to Action Table\]](#)

### Action 0xF4:

Value	Parameter Description
0xF4	MSPK ENTER Stereo MODE

Description:

This action is used for MSPK enter stereo mode. It reports MSPK link status and CSB state.

[\[Return to Action Table\]](#)

### Action 0xF5:

Value	Parameter Description
0xF5	MSPK ENTER Concert MODE

Description:

This action is used for MSPK enter Concert mode. It reports MSPK link status and CSB state.

[\[Return to Action Table\]](#)

### Action 0xF6:

Value	Parameter Description
0xF6	Concert mode ADD THIRD SPK

Return error:

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used to add third SPK.

[\[Return to Action Table\]](#)

### Action 0xF7

Value	Parameter Description
0xF7	MSPK_SOUND_SYNCHRONIZATION

Return error:

*Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used for MSPK sound re-synchronize

# Audio UART Command Set

[\[Return to Action Table\]](#)

## Action 0xF8

Value	Parameter Description
0xF8	MSPK_CSB_CONNECTED_MODE_SWITCH

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	SPK is Peripheral role

Description:

This action is used for MSPK to switch connected mode.

Note: These Actions are not supported in MSPK2, IS2066\_206 WST, IS2066\_207 WST and Audio Transceiver, etc. Please reference to “MMI action” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

## Action 0xF9

Value	Parameter Description
0xF9	MSPK_BACK_TO_LAST_MODE

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under IDLE mode

Description:

This action is used for MSPK to switch back to last mode.

[\[Return to Action Table\]](#)

## Action 0xFA

Value	Parameter Description
0xFA	MSPK one key connect/disconnect with Link back immediately

Return error:

Length: 1 Byte

Value	Description	Condition
0x01	Command disallow	Call active Line-in/Aux-in CSB mode disable

## Audio UART Command Set

CSB state doesn't under  
"Connecting", "Connected" or  
"Add 3<sup>rd</sup> SPK"

### Description:

This action is used for MSPK one key connect/disconnect. In ODM FY18 project, the flow of multiple speakers is disconnecting BT link, connecting CSB link and link back **after connecting all Peripheral speakers**. This command only changes the flow of multiple speakers a little bit. The flow of multiple speakers of the command is disconnecting BT link, connecting CSB link and link back **after connecting the first Peripheral speakers**.

Note: These Actions are only supported in ODM project. Please reference to "MMI action" sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

[\[Return to Action Table\]](#)

### Action 0xFB

Value	Parameter Description
0xFB	Combine Action 0xF4 and 0xE2. The condition of command disallow is the same with Action 0xE2.

[\[Return to Action Table\]](#)

### Action 0xFC

Value	Parameter Description
0xFC	Combine Action 0xF5 and 0xE2. The condition of command disallow is the same with Action 0xE2.

[\[Return to Action Table\]](#)

# Audio UART Command Set

## 7 EVENTS

### 7.1 Command\_Ack (0x00)

Event	Event Code	Event Parameters
Command_Ack	0x00	Command_ID, Status

#### Description:

This event is used to acknowledge the command. Status field of this event will tell whether the command is processed successfully or not.

#### Event Parameters:

*Command\_ID:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The Command ID of the command to acknowledge

*Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	Command complete: BTM can handle this command.
0x01	Command disallow: BTM cannot handle this command.
0x02	Unknown command
0x03	Parameters error
0x04	BTM is busy: This status is used to notify host MCU that SPP data cannot be sent out in this moment because of ACL Tx buffer or RFCOMM credit issue. BTM will send Command_Ack event with the status "Command complete" once the SPP data can be processed.
0x05	BTM memory is full: This status is used to notify host MCU that SPP/BLE data cannot be sent out in this moment because of OS heap memory is full. BTM will send Command_Ack event with the status "Command complete" once the SPP data can be processed and MCU must resend previous packet.
Others	Reserved

[\[Return to event Table\]](#)

### 7.2 BTM\_Status (0x01)

Event	Event Code	Event Parameters
BTM_Status	0x01	State, Link_Info, Parameter

#### Description:



## Audio UART Command Set

This event is used to indicate the BTM status. When there is any change in the BTM status by using this event status change will be informed to the host MCU.

### Event Parameters:

*State:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Power OFF state
0x01	Pairing state (discoverable mode)
0x02	Power ON state
0x03	Pairing successful
0x04	Pairing failed
0x05	HF/HS link established
0x06	A2DP link established
0x07	HF link disconnected
0x08	A2DP link disconnected
0x09	SCO link connected
0x0A	SCO link disconnected
0x0B	AVRCP link established
0x0C	AVRCP link disconnected
0x0D	Standard SPP connected
0x0E	Standard_SPP / iAP disconnected
0x0F	Standby state
0x10	iAP connected
0x11	ACL disconnected
0x12	MAP connected
0x13	MAP operation forbidden
0x14	MAP disconnected
0x15	ACL connected
0x16	SPP / iAP disconnected no_other Profile
0x17	Link back ACL (BT paging)
0x18	Inquiry State
0x80	Current audio source is not Aux in or A2DP
0x81	Current audio source is Aux in
0x82	Current audio source is A2DP

Note: 0x16 is only supported in ODM project. And 0x80, 0x81, 0x82 are only supported in MSPKv2 and Audio Transceiver, etc. Please reference to “Exception Notice” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

*Link\_Info: For State 0x00, 0x01, 0x0F, 0x12, 0x13, 0x14,  
0x80, 0x81, 0x82*

*Length: 1 Byte*

Value	Parameter Description
-------	-----------------------

## Audio UART Command Set

0xXX	Reserve
------	---------

*Link\_Info: For State 0x02*

*Length: 1 Byte*

Value	Parameter Description
0xXX	0: Power on 1: Already power on.

*Link\_Info: For State 0x03, 0x09, 0x0A*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Current link id

*Link\_Info: For State 0x04*

*Length: 1 Byte*

Value	Parameter Description
0xXX	For pairing failure(0x04) case, This parameter indicates the reason 0: Time out 1: Fail 2: Exit pairing mode

*Link\_Info: For State 0x05 0x06 0x0B*

*Length: 1 Byte*

Value	Parameter Description
0xXX	This parameter indicates both linked device and data base information. The format is shown below: Bit7~4 : linked device id(0~7) Bit3~0 : linked data base(0, 1 or 2) check Application release note for max connected profiles number (e.g. MSPKv2 support 3 A2DP, 3 AVRCP, 1 HFP)

*Parameter: For State 0x05*

*Length: 1 Byte*

Value	Parameter Description
0x00	HSP is connected
0x01	HFP is connected

*Link\_Info: For State 0x07 0x08 0x0C 0x15 0x17*

*Length: 1 Byte*

Value	Parameter Description
0xXX	This parameter shows the linked data base (0 or 1)

*Link\_Info: For State 0x0D 0x10*

*Length: 5~19*

*Bytes*

Value	Parameter Description
-------	-----------------------

# Audio UART Command Set

0xXX	Byte 0 This parameter indicates both link device and data base information. The format is shown below: Bit7~4 : linked device id(0~7) Bit3~0 : linked data base(0, 1, 2)
0xXX	Byte 1: channel index Specify this byte for data transmission in 2 SPP or 2 iAP connection condition. MCU can just copy this byte to channel_index byte of Send_SPP/iAP_Data if MCU want to transfer data to remote APP Bit0~1: Bluetooth connection index (data base index). Range from 0~3. Bit 2: LE connection indicator Bit3~5: rfcmm index. Range from 0 ~ 7. Bit6~7: iAP session index. 1 is 1st session and 2 is 2nd session. 0 means not a iAP / iAP2 connection
0xXX	Byte 2: UUID length. 2 or 16 bytes UUID
0XXXXXXXXXX	UUID

*Link\_Info: For State 0x0E*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Byte 1: channel index Specify this byte for data transmission in 2 SPP or 2 iAP connection condition. MCU can just copy this byte to channel_index byte of Send_SPP/iAP_Data if MCU want to transfer data to remote APP Bit0~1: Bluetooth connection index (data base index). Range from 0~3. Bit 2: LE connection indicator Bit3~5: rfcmm index. Range from 0 ~ 7. Bit6~7: iAP session index. 1 is 1st session and 2 is 2nd session. 0 means not a iAP / iAP2 connection

*Link\_Info: For State 0x11*

*Length: 1 Byte*

Value	Parameter Description
0x00	Disconnection
0x01	Link loss

*Link\_Info: For State 0x16*

*Length: 6 Byte*

*BT\_Addr:*

*Length:6*

*Bytes*

Value	Parameter Description
0XXXXXXXXXXXX	The Bluetooth address of the target device that BTM reject the SPP connection

# Audio UART Command Set

[\[Return to event Table\]](#)

## 7.3 Call\_Status (0x02)

Event	Event Code	Event Parameters
Call_Status	0x02	Data_Base_Index, Call_Status

### Description:

This event is used to indicate about the HF call status of BTM.

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Call\_Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	Idle
0x01	voice dial
0x02	incoming call
0x03	outgoing call
0x04	call active
0x05	a call active with a call waiting
0x06	a call active with a call hold

[\[Return to event Table\]](#)

## 7.4 Caller\_ID (0x03)

Event	Event Code	Event Parameters
Caller_ID	0x03	Data_Base_Index, Number

### Description:

This event is used to indicate about the caller ID of the incoming call.

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link

# Audio UART Command Set

0x01	database 1 for dedicate link
------	------------------------------

Number:

Length: N

Bytes

Value	Parameter Description
0xXX..	caller Id or phone number

[\[Return to event Table\]](#)

## 7.5 SMS\_Received\_Indication (0x04)

Event	Event Code	Event Parameters
SMS_Received_Indication	0x04	Data_Base_Index, Indication

### Description:

This event is used to indicate about the sms status that BTM received from mobile phone.

### Event Parameters:

Data\_Base\_Index:

Length: 1 Byte

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

Indication:

Length: 1 Byte

Value	Parameter Description
0x00	No new sms received
0x01	New sms received

[\[Return to event Table\]](#)

## 7.6 Missed\_Call\_Indication (0x05)

Event	Event Code	Event Parameters
Missed_Call_Indication	0x05	Data_Base_Index, Information

### Description:

This event is used to indicate that BTM received missed call notification from mobile phone.

### Event Parameters:

## Audio UART Command Set

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Information:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

[\[Return to event Table\]](#)

### 7.7 Phone\_Max\_Battery\_Level (0x06)

Event	Event Code	Event Parameters
Phone_Max_Battery_Level	0x06	Data_Base_Index, Max_Battery_Level

#### Description:

This event is used to indicate about the mobile phone max battery level that BTM received from mobile phone.

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Max\_Battery\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Max Battery Level

[\[Return to event Table\]](#)

### 7.8 Phone\_Current\_Battery\_Level (0x07)

Event	Event Code	Event Parameters
Phone_Current_Battery_Level	0x07	Data_Base_Index, Battery_Level

#### Description:

This event is used to indicate about the mobile phone current battery level that BTM received from mobile phone.

# Audio UART Command Set

## Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Battery\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Current Battery Level

[\[Return to event Table\]](#)

## 7.9 Roaming\_Status (0x08)

Event	Event Code	Event Parameters
Roaming_Status	0x08	Data_Base_Index, Status

## Description:

This event is used to indicate about the roaming status that BTM received from mobile phone.

## Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Non Roaming
0x01	Roaming

[\[Return to event Table\]](#)

## 7.10 Phone\_Max\_Signal\_Strength\_Level (0x09)

Event	Event Code	Event Parameters
Phone_Max_Signal_Strength_Level	0x09	Data_Base_Index, Signal_Level

## Description:

## Audio UART Command Set

This event is used to indicate the max signal strength level that BTM received from mobile phone.

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Signal\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Phone's maximum signal strength

[\[Return to event Table\]](#)

### 7.11 Phone\_Current\_Signal\_Strength\_Level (0x0A)

Event	Event Code	Event Parameters
Phone_Current_Signal_Strength_Level	0x0A	Data_Base_Index, Signal_Level

### Description:

This event is used to indicate the current signal strength level that BTM received from mobile phone.

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Signal\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Phone's current signal strength

[\[Return to event Table\]](#)

### 7.12 Phone\_Service\_Status (0x0B)

Event	Event Code	Event Parameters
Phone_Service_Status	0x0B	Data_Base_Index, Service



# Audio UART Command Set

## Description:

This event is used to indicate about the service status that BTM received from mobile phone.

## Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Service:*

*Length: 1 Byte*

Value	Parameter Description
0x00	No Service Available
0x01	Service Available

[\[Return to event Table\]](#)

## 7.13 BTM\_Battery\_Status (0x0C)

Event	Event Code	Event Parameters
BTM_Battery_Status	0x0C	Battery_Status, Voltage_Level

## Description:

This event is used to indicate about the BTM's battery status.

## Event Parameters:

*Battery\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	dangerous level, and will auto shutdown
0x01	low level
0x02	normal level
0x03	high level
0x04	full level
0x05	in charging
0x06	charging completed

*Voltage\_Level:*

*Length: 1 Byte*

Value	Parameter Description
0x00	batt < 3.1V
0x01	3.1V <= batt < 3.2V
0x02	3.2V <= batt < 3.3V
0x03	3.3V <= batt < 3.4V

## Audio UART Command Set

0x04	3.4V <= batt < 3.5V
0x05	3.5V <= batt < 3.6V
0x06	3.6V <= batt < 3.7V
0x07	3.7V <= batt < 3.8V
0x08	3.8V <= batt < 3.9V
0x09	3.9V <= batt < 4.0V
0x0A	4.0V <= batt < 4.1V
0x0B	4.1V <= batt < 4.2V
0x0C	4.2V <= batt

[\[Return to event Table\]](#)

### 7.14 BTM\_Charging\_Status (0x0D)

Event	Event Code	Event Parameters
BTM_Charging_Status	0x0D	Charger_Status, Charger_Type

#### Description:

This event is used to indicate about the charger status and charger type.

#### Event Parameters:

*Charger\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Charger is not plugged in
0x01	In charging
0x02	Charging completed
0x03	Charging failed
0x04	Charger type report

*Charger\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	BC_TYPE_UNKNOWN
0x01	BC_TYPE_NON_DCD
0x02	BC_TYPE_SDP
0x03	BC_TYPE_DCP
0x04	BC_TYPE_CDP
0x10	BC_TYPE_SONY
0x20	BC_TYPE_APPLE_2_5W
0x21	BC_TYPE_APPLE_5W
0x22	BC_TYPE_APPLE_10W
0x23	BC_TYPE_APPLE_12W
Others	Reserved

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.15 Reset\_To\_Default (0x0E)

Event	Event Code	Event Parameters
Reset_To_Default	0x0E	Reserved

### Description:

This event is used to indicate that BTM finished the Master Reset for the MMI command (0x56) trigger.

### Event Parameters:

*Reserved:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	database 0 for dedicate link

[\[Return to event Table\]](#)

## 7.16 Report\_HF\_Gain\_Level (0x0F)

Event	Event Code	Event Parameters
Report_HF_Gain_Level	0x0F	Data_Base_Index, Gain_Level

### Description:

This event is used to report the HF gain level set by remote Audio Gateway (Phone).

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for a dedicate HF/HS device
0x01	database 1 for a dedicate HF/HS device

*Gain\_Level:* *Length: 1 Byte*

Value	Parameter Description
0x00-0x0F	Gain level that synched with HF device

[\[Return to event Table\]](#)

## 7.17 EQ\_Mode\_Indication (0x10)

Event	Event Code	Event Parameters
EQ_Mode_Indication	0x10	EQ_Mode,Reserved

## Audio UART Command Set

### Description:

This event is used to notify the host MCU that EQ mode setting changed by MMI or EQ\_Mode\_Setting command.

### Event Parameters:

*EQ\_Mode* *Length: 1 Byte*

Value	Parameter Description
0x00	Off Mode
0x01	Soft Mode
0x02	Bass Mode
0x03	Treble Mode
0x04	Classical Mode
0x05	Rock Mode
0x06	Jazz Mode
0x07	Pop Mode
0x08	Dance Mode
0x09	R&B Mode
0x0B	User Mode 1

*Reserved:* *Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

[\[Return to event Table\]](#)

### 7.18 Read\_Linked\_Device\_Information\_Reply (0x17)

Event	Event Code	Event Parameters
Read_Linked_Device_Information_Reply	0x17	Data_Base_Index, Type, Info

### Description:

This event is used to reply Read\_Linked\_Device\_Information command.

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

## Audio UART Command Set

Type:

Length: 1 Byte

Value	Parameter Description
0x00	reply device name
0x01	reply in-band ringtone status
0x02	reply remote device is a iAP device or standard SPP device
0x03	reply remote device supported AVRCP function
0x04	reply HF&A2DP gain
0x05	reply Line In gain
0x06	reply A2DP used codec type
others	reserved

Info: for Type 0x00

Length: N

Bytes

Value	Parameter Description
0xXX...	N bytes Bluetooth name with NULL terminated. (N <= 249 with NULL terminated) Note: If remote device response empty name string, then BTM will report name with data NULL terminated (0x00) only.

Info: for Type 0x01

Length: 1 Byte

Value	Parameter Description
0x00	Disabled
0x01	Enabled

Info: for Type 0x02

Length: 1 Byte

Value	Parameter Description
0x00	Standard SPP device
0x01	iAP device

Info: for Type 0x03

Length: 1 Byte

Value	Parameter Description
0xXX	Bit Mask bit0:media player status notification bit1:absolute volume control

Info: for Type 0x04

Length: 1 Byte

Value	Parameter Description
0xXX	bit[3:0]: A2DP gain bit[7:4]: HF gain

## Audio UART Command Set

Info: for Type 0x05

Length: 1 Byte

Value	Parameter Description
0xXX	Line in gain

Info: for Type 0x06

Length: 1 Byte

Value	Parameter Description
0x00	SBC
0x02	AAC
0xFF	Vendor (LDAC)
Others	Reserved

[\[Return to event Table\]](#)

### 7.19 Read\_BTMM\_Version\_Reply (0x18)

Event	Event Code	Event Parameters
Read_BTMM_Version_Reply	0x18	Type, Version

#### Description:

This event is used to reply Read\_BTMM\_Version command.

#### Event Parameters:

Type:

Length: 1 Byte

Value	Parameter Description
0x00	UART Version
0x01	BTM FW Version
0x02 ★	EEPROM Version
0x03 ★	BTM FW Detail Version
0x04 ★	DSP Version
0x05 ★	Project Target Version
0x06-0xFF	Reserved

★PLEASE CHECK THE EXCEPTION NOTICE SHEET IN  
AUDIOUARTCOMMANDSET\_SUMMARY\_TABLE\_V2.X.XLSX.

Version: for Type 0x00

Length: 2 Bytes

Value	Parameter Description
0xFFFF	1st byte: UART Command Main version 2nd byte: UART Command Sub version for example 00 07 means version 0.07

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*Version: for Type 0x01*

*Length: 2 Bytes*

Value	Parameter Description
0XXXXX	1st byte: Firmware Main version 2nd byte: Firmware Sub version for example 00 07 means version 0.07

*Version: for Type 0x02*

*Length: 2 Bytes*

Value	Parameter Description
0XXXXX	1st byte: EEPROM Main version 2nd byte: EEPROM Sub version for example 00 07 means version 0.07

\*Please check the exception notice in summary table.

*Version: for Type 0x03*

*Length: 4 Bytes*

Value	Parameter Description
0XXXXX	1st byte: Firmware Main version 2nd byte: Firmware Sub version 3rd byte: Firmware Control version High byte 4th byte: Firmware Control version Low byte for example 00 07 00 01 means version 0.07.0001

\*Please check the exception notice in summary table.

*Version: for Type 0x04*

*Length: 4 Bytes*

Value	Parameter Description
0XXXXX	1st byte: DSP Main version 2nd byte: DSP Sub version 3rd byte: DSP Control version High byte 4th byte: DSP Control version Low byte for example 00 07 00 01 means version 0.07.0001

\*Please check the exception notice in summary table.

*Version: for Type 0x05*

*Length: 3 Bytes*

Value	Parameter Description
0XXXXXXX	ASCII abbreviation for project target

\*Please check the exception notice in summary table.

*Version: for Type 0xFF*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Reserved

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## Audio UART Command Set

### 7.20 Call\_List\_Report (0x19)

Event	Event Code	Event Parameters
Call_List_Report	0x19	Call_List_String (ASCII)

#### Description:

This event is used to notify +CLCC information for the MMI command (0x0F).

#### Event Parameters:

*Call\_List\_String:* *Length: N Bytes*

Value	Parameter Description
0xXXXXXX...	" +CLCC: xxxxx"

Event	Event Code	Event Parameters
Access_Finish	0x16	Type, Status

*Type:* *Length: 1 Byte*

Value	Parameter Description
0x00	Report call list finish

*Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	Successful
Others	Error: when AG do not support this command, it will response +ERROR, and then SPK Module will report this to MCU

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### 7.21 AVC\_Vendor\_Dependent\_Response (0x1A)

Event	Event Code	Event Parameters
AVC_Vendor_Dependent_Response	0x1A	Data_Base_Index, AVC_Rsp_Payload

#### Description:

This event is used to reply AVC\_Vendor\_Dependent\_Cmd command. Detail response information needs to refer to AVRCP Specification [\[4\]](#)



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## Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*AVC\_Rsp\_Payload:*

*Length: N Byte*

Value	Parameter Description
byte0	Response type: 0x08: Not implement 0x09: Accept 0x0A: Reject 0x0C: Stable 0x0D: Changed 0x0F: Interim
Byte1	Subunit_type:5 bit   Subunit_ID:3 bit: 0x48
Byte2	Opcode: 0x00 (Vendor Dependent)
Byte3~5	Company ID: 0x00 0x19 0x58
Byte6	AVRCP1.3 AVC specific command PDU Id
Byte7	Packet Type: 0x00 (single packet)
Byte8~9	Response parameter length
Byte10-N	Response parameter

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## 7.22 BTM\_Utility\_Req (0x1B)

Event	Event Code	Event Parameters
BTM_Utility_Req	0x1B	Action_Type, Parameter

## Description:

This event is used to request host MCU to do some specific function.

## Event Parameters:

*Action\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	BTM ask MCU to control the external amplifier
0x01	BTM report the Aux line-in status to Host MCU.
0x02	BTM notify MCU to handle BTM or MCU update process
0x03	BTM notify MCU eeprom update finish
0x04	BTM report the A2DP codec status to Host MCU.

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0x05	[MSPK] BTM notify MCU to sync power off BTM
0x06	[MSPK] BTM notify MCU to sync Volume Control
0x07	[MSPK] BTM notify MCU to sync internal gain
0x08	[MSPK] BTM notify MCU to sync A2DP absolute volume
0x09	[MSPK] BTM notify MCU current channel setting
0x0A	[MSPK] BTM notify MCU synced MSPK power condition
0x0B	[MSPK] BTM notify MCU MSPK command success
0x0C	[MSPK] BTM notify MCU MSPK command fail
0x0D	[MSPK] BTM notify MCU certain MSPK Peripheral status has been changed
0x0E	Reserved
0x0F	Reserved
0x10	Reserved
0x11	[MSPK] BTM notify MCU to sync Line-in absolute volume
0x12	[MSPK] BTM notify MCU that MSPK connection complete.
0x13	BTM reports AVDTP start state to Host MCU.
0x14	BTM reports AVDTP suspend state to Host MCU.
others	reserved

Parameter: For Action\_Type 0x00

Length: 1 Byte

Value	Parameter Description
0x00	Mute or switch off amplifier
0x01	Unmute or switch on amplifier
Others	Reserved

Parameter: For Action\_Type 0x01

Length: 1 Byte

Value	Parameter Description
0x00	Aux line in is unplugged.
0x01	Aux line in is plugged.
0x02	Aux line in is plugged and with audio signal.
0x03	Aux line in is plugged and silence.
Others	Reserved

Parameter: For Action\_Type 0x02

Length: 1 Byte

Value	Parameter Description
0x00	BTM FW update
0x01	MCU FW update
Others	Reserved

Parameter: For Action\_Type 0x03

Length: 1 Byte

Value	Parameter Description
0x00	EEPROM update successful

## Audio UART Command Set

Others

Reserved

*Parameter: For Action\_Type 0x04*

*Length: 1 Byte*

Value	Parameter Description
0x00	A2DP stop
0x01	A2DP start
Others	Reserved

*Parameter: For Action\_Type 0x06*

*Length: 1 Byte*

Value	Parameter Description
0x00	Volume Up
0x01	Volume Down
Others	Reserved

*Parameter: For Action\_Type 0x07*

*Length: 1 Byte*

Value	Parameter Description
0x0X	Fist 4 bits indicate A2DP gain level
0xX0	Last 4 bits indicate Line In gain level

*Parameter: For Action\_Type 0x08*

*Length: 1 Byte*

Value	Parameter Description
0xXX	A2DP Absolute Volume

*Parameter: For Action\_Type 0x09*

*Length: 1 Byte*

Value	Parameter Description
0x00	No Mix channel
0x01	L+L channel
0x02	R+R channel
0x03	(L+R) / 2 -> L, (L+R) / 2 -> R channel

*Parameter: For Action\_Type 0x0A*

*Length: 1 Byte*

Value	Parameter Description
0x00	Battery power with Low battery
0x01	Adaptor power with Low battery
0x02	Battery power
0x03	Adaptor power

*Parameter: For Action\_Type 0x0B 0x0C*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	Audio effect type

*Parameter: For Action\_Type 0x0D*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

*Parameter: For Action\_Type 0x11*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Line-in Absolute Volume

*Parameter: For Action\_Type 0x12*

*Length: 1 Byte*

Value	Parameter Description
0x01	MSPK connect complete

*Parameter: For Action\_Type 0x13, 0x14*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Data_Base_Index

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### 7.23 Vendor\_AT\_Cmd\_Rsp (0x1C)

Event	Event Code	Event Parameters
Vendor_AT_Cmd_Rsp	0x1C	Data_Base_Index, Status

#### Description:

This event is used to reply Vendor\_AT\_Cmd (0x0A) command.

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Status:*

*Length: 1 Byte*

Value	Parameter Description
-------	-----------------------

## Audio UART Command Set

0x00	AG response OK
0x01	AG response ERROR
0x02	No response from AG
Others	Reserved

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### 7.24 Report\_Vendor\_AT\_Event (0x1D)

Event	Event Code	Event Parameters
Report_Vendor_AT_Event	0x1D	Data_Base_Index, Result_Payload

#### Description:

This event is used to reply Vendor\_AT\_Cmd (0x0A) command.

#### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Result\_Payload:* *Length: N Byte*

Value	Parameter Description
0xXX...	Result code. For example : AG send result code as "+test:1" , the result code will be "+test:1"

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### 7.25 Read\_Link\_Status\_Reply (0x1E)

Event	Event Code	Event Parameters
Read_Link_Status_Reply	0x1E	Device_State, Database0_Connect_Status, Database1_Connect_Status, Database0_Play_Status, Database1_Play_Status, Database0_Stream_Status, Database1_Stream_Status,

#### Description:

This event is used to reply the Read\_Link\_Status(0X0D) command.

#### Event Parameters:

## Audio UART Command Set

*Device\_State:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Power OFF state
0x01	pairing state (discoverable mode)
0x02	standby state
0x03	Connected state with only HF profile connected
0x04	Connected state with only A2DP profile connected
0x05	Connected state with only SPP profile connected
0x06	Connected state with multi-profile connected

*Database0\_Connect\_Status / Database1\_Connect\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	1 indicates connected Bit0 : A2DP profile signaling channel connected Bit1 : A2DP profile stream channel connected Bit2 : AVRCP profile connected Bit3 : HF profile connected Bit4 : SPP connected

*Database0\_Play\_Status / Database1\_Play\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	STOP
0x01	PLAYING
0x02	PAUSED
0x03	FWD_SEEK
0x04	REV_SEEK
0x05	FAST_FWD
0x06	REWIND
0x07	WAIT_TO_PLAY
0x08	WAIT_TO_PAUSE

*Database0\_Stream\_Status / Database1\_Stream\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	No Streaming
0x01	Streaming is going on

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### 7.26 Read\_Paired\_Device\_Record\_Reply (0x1F)

Event	Event Code	Event Parameters
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## Audio UART Command Set

Read_Paired_Device_Record_R epl	0x1F	Paired_Device_Number, Paired_Record
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### Description:

This event is used to reply the Read\_Paired\_Device\_Record (0X0E) command.

### Event Parameters:

*Paired\_Device\_Number:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Paired Device Number

*Paired\_Record: (7 Bytes Per Record)* *Length: (7\*Total Record)  
Bytes*

Value	Parameter Description
0XXXXXXXXXXXXXX	Byte 0: Link priority : 1 is the highest(newest device) and 4 is the lowest(oldest device) Byte 1~6 :Linked device BD address (6 bytes with low byte first)

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### 7.27 Read\_Local\_BD\_Address\_Reply (0x20)

Event	Event Code	Event Parameters
Read_Local_BD_Address_Repl y	0x20	BD_Address

### Description:

This event is used to reply the Read\_Local\_BD\_Address (0X0F) command.

### Event Parameters:

*BD\_Address:* *Length: 6 Bytes*

Value	Parameter Description
0xXX..	BD address with lower byte first

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### 7.28 Read\_Local\_Device\_Name\_Reply (0x21)

Event	Event Code	Event Parameters
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## Audio UART Command Set

Read_Local_Device_Name_Reply	0x21	Name_Length, Device_Name
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### Description:

This event is used to reply the Read\_Local\_Device\_Name (0X10) command. The maximum length of device name is 64 bytes.

### Event Parameters:

*Name\_Length:* *Length: 1 Byte*

Value	Parameter Description
0xXX..	Name Length

*Device\_Name:* *Length: Name\_Length Bytes*

Value	Parameter Description
0xXX..	Device Name With Length Name Length

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## 7.29 Reprt\_SPP/iAP/LE\_Data (0x22)

Event	Event Code	Event Parameters
Report_SPP/iAP/LE_Data	0x22	Channel_Index, Type, Total_Length, Payload_Length, Payload

### Description:

This event is used to send SPP/iAP /LE data coming from remote device to host MCU.

### Event Parameters:

*Channel\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x01	Specify this byte for data transmission in 2 SPP / 2 iAP / LE connection. bit0~1: Bluetooth connection index (data base index). Range from 0~3. bit2: LE connection indicator bit3~5: rfcomm index. Range from 0 ~ 7. bit6~7: iAP session index. 1 is 1st session and 2 is 2nd session. 0 means not a iAP / iAP2 connection

*Type:* *Length: 1 Byte*



## Audio UART Command Set

Value	Parameter Description
0x00	single packet
0x01	fragmented start packet
0x02	fragmented continue packet
0x03	fragmented end packet

*Total\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	total payload length

*Payload\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	payload length in this packet

*Payload:*

*Length: N*

*Bytes*

Value	Parameter Description
0xFFFF...	payload

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### 7.30 Reprt\_Link\_Back\_Status (0x23)

Event	Event Code	Event Parameters
Report_Link_Back_Status	0x23	Link_Back_Status, Link_Back_Result

#### Description:

This event is used to indicate the link back status of BTM..

#### Event Parameters:

*Link\_Back\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	ACL connection
0x01	HF connection
0x02	A2DP connection
0x03	SPP connection
0x04	under page state

*Link\_Back\_Result: for Link\_Back\_Status 0x00*

*Length: 1 Byte*

Value	Parameter Description
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## Audio UART Command Set

0xFF	fail
Others	success
Bit7~4	linked device id(0~7)
Bit3~0	linked data base(0 or 1)

*Link\_Back\_Result: for Link\_Back\_Status 0x01~0x03*

*Length: 1 Byte*

Value	Parameter Description
0x00	Success
0x01	Failed

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### 7.31 Report\_Ring\_Tone\_Status (0x24)

Event	Event Code	Event Parameters
Report_Ringtone_Status	0x24	Ringtone_Mode, Status

#### Description:

This event is used to indicate the ringtone mode and ringtone playback status.

#### Event Parameters:

*Ringtone\_Mode:*

*Length: 1 Byte*

Value	Parameter Description
0xFF	Please Refer <a href="#">Tone Type</a>

*Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Ringtone playback is going to be stopped
0x01	Ringtone playback is going to start

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### 7.32 User\_Confirm\_SSP\_Req (0x25)

Event	Event Code	Event Parameters
User_Confirm_SSP_Req	0x25	Data_Base_Index, Numeric_Value

#### Description:

This event is used to indicate that user confirmation of a numeric value is required. The host shall reply with the User\_Confirm\_SSP\_Req\_Reply command to indicate whether user has

## Audio UART Command Set

confirmed the numeric value or not. If the host has output capability it shall display the Numeric\_Value to the user. It shall reply the yes/no response from the user.

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Numeric\_Value:*

*Length: 4 Bytes*

Value	Parameter Description
0x00000000~0x000F423 F	Numeric value to be displayed. Valid values are decimal 000000 – 999999.

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### 7.33 Report\_AVRCP\_Volume\_Ctrl (0x26)

Event	Event Code	Event Parameters
Report_AVRCP_Volume_Ctrl	0x26	Data_Base_Index, Volume_Ctrl_Indication

### Description:

This event is used to indicate the received AVRCP volume control to MCU. For AVRCPv1.0, remote device may request speaker to adjust volume up or down.

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 that related to a dedicate A2DP link
0x01	database 1 that related to a dedicate A2DP link

*Volume\_Ctrl\_Indication:*

*Length: 1 Byte*

Value	Parameter Description
0x00	volume up
0x01	volume down

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### 7.34 Report\_Input\_Signal\_Level (0x27)

Event	Event Code	Event Parameters
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Report_Input_Signal_Level	0x27	Report_Mask_P0, Report_Mask_P1, Report_Mask_P2, Report_Mask_P3, Input_level_P0, Input_level_P1, Input_level_P2, Input_level_P3,
---------------------------	------	---------------------------------------------------------------------------------------------------------------------------------------

### Description:

This event shall be send under two condition, first condition is when the MCU set the specific GPIOs as input by GPIO\_CTRL(0x1E) command and the second condition is when input GPIO input signal level is changed. Since it was detected periodically by coarse timer, the level change detected time may variant, it may need take 1.28s to 1.92s.

### Event Parameters:

*Report\_Mask\_P0:* *Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P0 for input signal level reporting. Bit 0: P0_0 input signal level reporting indication Bit 1: P0_1 input signal level reporting indication .....

*Report\_Mask\_P1:* *Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P1 for input signal level reporting. Bit 0: P1_0 input signal level reporting indication Bit 1: P1_1 input signal level reporting indication .....

*Report\_Mask\_P2:* *Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P2 for input signal level reporting. Bit 0: P2_0 input signal level reporting indication Bit 1: P2_1 input signal level reporting indication .....

*Report\_Mask\_P3:* *Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Bit mask of P3 for input signal level reporting. Bit 0: P3_0 input signal level reporting indication Bit 1: P3_1 input signal level reporting indication .....

*Input\_level\_P0:* *Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0bXXXXXXXX	Input signal level reporting of P0. Bit 0: P0_0 input signal level. Bit 1: P0_1 input signal level. .....

*Input\_level\_P1:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Input signal level reporting of P1. Bit 0: P1_0 input signal level. Bit 1: P1_1 input signal level. .....

*Input\_level\_P2:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Input signal level reporting of P2. Bit 0: P2_0 input signal level. Bit 1: P2_1 input signal level. .....

*Input\_level\_P3:*

*Length: 1 Byte*

Value	Parameter Description
0bXXXXXXXX	Input signal level reporting of P3. Bit 0: P3_0 input signal level. Bit 1: P3_1 input signal level. .....

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### 7.35 Report\_iAP\_Info (0x28)

Event	Event Code	Event Parameters
Report_iAP_Info	0x28	Type, Parameter

#### Description:

This event is used to report the iAP data session status.

#### Event Parameters:

*Type:*

*Length: 1 Byte*

Value	Parameter Description
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## Audio UART Command Set

0x00	Data session status.
0x01	Authentication completed.

*Parameter: For Type 0x00*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Bit0~3:data session status 0x00:data session close 0x01:data session open Bit4~7:(only valid for session open) protocol index

*Parameter: For Type 0x01*

*Length: 1 Byte*

Value	Parameter Description
0x00	iAP authentication OK
0x01	iAP2 authentication OK

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### 7.36 Report\_AVRCP\_ABS\_Volume\_Level (0x29)

Event	Event Code	Event Parameters
Report_AVRCP_ABS_Volume_Level	0x29	Data_Base_Index, Absolute_Volume

#### Description:

This event is used to indicate the received AVRCP absolute volume level to MCU. For AVRCPv1.0, remote device may request speaker to change the volume level.

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0x00	database 0 that related to a dedicate A2DP link
0x01	database 1 that related to a dedicate A2DP link

*Absolute\_Volume:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Report in range 0x00~0x7F to indicate the percentage of total(max) volume level

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## 7.37 Report\_Voice\_Prompt\_Status (0x2A)

Event	Event Code	Event Parameters
Report_Voice_Prompt_Status	0x2A	Status, Reserved

### Description:

This event is used to report the TTS status.

### Event Parameters:

*Status:* *Length: 1 Byte*

Value	Parameter Description
0x01	Ready
Others	Reserved

*Reserved:* *Length: 1 Byte*

Value	Parameter Description
0xFF	Reserved

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## 7.38 Report\_Type\_Codec (0x2D)

Event	Event Code	Event Parameters
Report_Type_Codec	0x2D	Sampling_Frequency, Mode

### Description:

This event is used to inform MCU about the next I2S state which DSP prepare to enter. So that MCU can configure its external CODEC to corresponding state.

### Event Parameters:

*Sampling\_Frequency:* *Length: 1 Byte*

Value	Parameter Description
0x00	8KHz sample rate
0x02	16KHz sample rate
0x04	32KHz sample rate
0x05	48KHz sample rate
0x06	44.1KHz sample rate
0x07	88KHz sample rate
0x08	96KHz sample rate
Others	Reserved

## Audio UART Command Set

*Mode:* *Length: 1 Byte*

Value	Parameter Description
0x00	No action
0x01	Prepare
0x02	Audio in mode
0x03	PCM mode
0x04	A2DP decode mode
0x06	SCO(HF) mode
0x07	Tone
0x08	Voice prompt
Others	Reserved

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### 7.39 Report\_Type\_BTMM\_Settings (0x2E)

Event	Event Code	Event Parameters
Report_Type_BTMM_Settings	0x2E	Setting_Type, Setting_Value

#### Description:

This event is used to report the BTM setting status to MCU.

#### Event Parameters:

*Setting\_Type:* *Length: 1 Byte*

Value	Parameter Description
0x00	Pairing timeout setting
0x01	Supported codec type setting
0x02	BTM standby mode setting
Others	Reserved

*Setting\_Value: For Setting\_Type 0x00* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reply pairing timeout setting with unit 30 second

*Setting\_Value: For Setting\_Type 0x01* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reply supported codec type with bit mask: bit0:SBC (Mandatory, must always been set) bit1:AAC bit2:VENDOR



# Audio UART Command Set

*Setting\_Value: For Setting\_Type 0x02*

*Length: 1 Byte*

Value	Parameter Description
0x00	BTM Standby mode disable
0x01	BTM Standby mode enable
Others	Reserved

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## 7.40 Report\_MCU\_Update\_Reply (0x2F)

Event	Event Code	Event Parameters
Report_MCU_Update_Reply	0x2F	Action, Data

### Description:

This event is to reply MCU\_Update\_Cmd(0x26).

Note: This event is not supported in MSPKv2 and Audio Transceiver, etc. Please reference to “Event” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

### Event Parameters:

*Action:*

*Length: 1 Byte*

Value	Parameter Description
0x00	reply total update Bin size, data(4bytes)
0x01	reply start or continue Bin data
0x02	reply last Bin data
others	reserved

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## 7.41 Report\_BTM\_Initial\_Status (0x30)

Event	Event Code	Event Parameters
Report_BTM_Initial_Status	0x30	Status, Reserved

### Description:

This event is to report the initialization status to MCU.

### Event Parameters:

*Action:*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0x00	initialization completed
Others	Reserved

*Reserved:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

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### 7.42 LE\_ANCS\_Service\_Event (0x31)

Event	Event Code	Event Parameters
LE_ANCS_Service_Event	0x31	SubEvent_Type, SubEvent_Payload

#### Description:

This event is used to report many kinds of notification that are generated on iOS devices by Bluetooth low-energy link.

#### Event Parameters:

*SubEvent\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	ANCS Search event
0x01	ANCS GetNotification Attribute event
0x02	ANCS Notification Source event
0x03	ANCS Data Source event
0x04-0xFF	Reserved

*SubEvent\_Payload: For SubEvent\_Type 0x00*

**Payload Description:** Report the ANCS search status to Notification Client.

*Search Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	ANCS Found
0x01	ANCS Not Found

*SubEvent\_Payload: For SubEvent\_Type 0x01*

**Payload Description:** Report the ANCS GetNotification status to Notification Client.

*GetNotification Event Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	No Error

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0x01	Invalid Handle
0x02	Read not Permitted
0x03	Write not Permitted
0x04	Invalid PDU
0x05	Insufficient Authentication
0x06	Request not Supported
0x07	Invalid Offset
0x08	Insufficient Authorization
0x09	Prepare Queue Full
0x0A	Attribute Not Found
0x0B	Attribute Not Long
0x0C	Insufficient Encryption Key Size
0x0D	Invalid Attribute Value Length
0x0E	Unlikely Error
0x0F	Unlikely Error
0x10	Unsupported Group Type
0x11	Insufficient Encryption
0x12-0x7F	Reserved
0x80-0x9F	Reserved for Application Error
0xA0	ANCS Error Code : Unknown Command (ANCS Spec)
0xA1	ANCS Error Code : Invalid Command (ANCS Spec)
0xA2	ANCS Error Code : Invalid Parameters (ANCS Spec)
0xA3	ANCS Error Code : Action Failed (ANCS Spec)
0xA4-0xFF	Reserved for Application Error

*SubEvent\_Payload: For SubEvent\_Type 0x02*

**Payload Description:** Report the data of ANCS notification source to Notification Client.

*Notification Source Value:* *Length: N*

*Bytes*

Value	Parameter Description
.....	Please refer to the Apple Notification Center Service v1.1 document, the format of a Notification source.

*SubEvent\_Payload: For SubEvent\_Type 0x03*

**Payload Description:** Report the data of ANCS data source to Notification Client.

*Data Source Value:* *Length: N*

*Bytes*

Value	Parameter Description
.....	Please refer to the Apple Notification Center Service v1.1 document, the format of a Data source.

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.43 LE\_Signaling\_Event (0x32)

Event	Event Code	Event Parameters
LE_Signaling_Event	0x32	SubEvent_Type, SubEvent_Payload

### Description:

This event is used to send Bluetooth low energy signaling event report/response.

### Event Parameters:

*SubEvent\_Type:* *Length: 1 Byte*

Value	Parameter Description
0x00	LE Status Report
0x01	LE Advertising Control Report
0x02	LE Connection Parameter Report
0x03	LE Connection Parameter Update RSP
0x04-0xFF	reserved

*SubEvent\_Payload: For SubEvent\_Type 0x00*

**Payload Description:** Report LE status.

**Payload Format:** Connection status, GATT service status

*Connection Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	Standby.
0x01	Advertising
0x02	Scanning.
0x03	Connected.

*GATT service status:* *Length: 1 Byte*

Value	Parameter Description
Bit 0	0: Transparent Data Transfer Service Inactive 1: Transparent Data Transfer Service Active
Bit 1	0: ANCS Service Inactive 1: ANCS Service Active
Bit 2~7	Reserved

*SubEvent\_Payload: For SubEvent\_Type 0x01*

**Payload Description:** Report LE Advertising Control status.

*Command Status:* *Length: 1 Byte*

Value	Parameter Description
-------	-----------------------

## Audio UART Command Set

0x00	Command Succeeded
	Command Failed.
0x01-0x3F	(Please refer to BLUETOOTH SPECIFICATION Version 4.0 [Vol 2] Part D, Error Codes on page 339 for a list of error codes and descriptions).

*SubEvent\_Payload: For SubEvent\_Type 0x02*

**Payload Description:** Report Current LE Connection Parameters which is set by LE Central Device.

**Payload Format:** Connection Interval, Connection Latency, Supervision Timeout

*Connection Interval:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Range: 0x0006 to 0x0C80 (7.5ms ~ 4s), value for the connection event interval.

*Connection Latency:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Range: 0x0006 to 0x0C80 (7.5ms ~ 4s), value for this connection.

*Supervision Timeout:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Range: 0x000A to 0x0C80 (100ms ~ 32s), Supervision timeout for the LE Link

*SubEvent\_Payload: For SubEvent\_Type 0x03*

**Payload Description:** Report the LE connection parameter update response.

*Result:* *Length: 2 Bytes*

Value	Parameter Description
0x0000	Connection Parameters Accepted.
0x0001	Connection Parameters Rejected.
Other	Reserved

[\[Return to event Table\]](#)

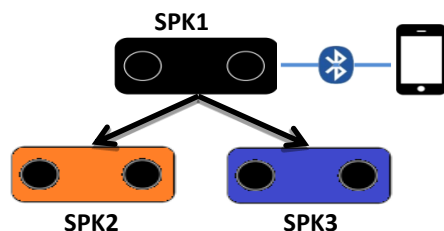
### 7.44 Report\_MSPK\_Link\_Status (0x33)

Event	Event Code	Event Parameters
Report_MSPK_Link_Status	0x33	CSB_Connection_State, (Mandatory) CSB_State, (Mandatory) CSB_Group_Number, (Optional) CSB_Address, (Optional)

#### Description:

## Audio UART Command Set

This event is used to indicate the state of Enhanced Connectionless Broadcasting used for MSPK link (eCSB –link).



### Event Parameters:

*CSB\_Connection\_State:*

*Length: 1 Byte*

Value	Parameter Description
0x00	The Central or Peripheral SPK report eCSB-link is non-exist
0x01	The Central SPK1 report SPK1 connect with SPK2 (Stereo Mode)
0x02	The Central SPK1 report SPK1 connect with SPK3 (Stereo Mode, deprecated)
0x03	The Central SPK1 report SPK1 connect with SPK2 and SPK3 (Stereo Mode, deprecated)
0x04	The Peripheral SPK report SPK2 or SPK3 was connected with SPK1 (Stereo Mode)
0x05	BTM is Concert Central and connect to at least one Concert Peripheral
0x06	BTM is Concert Peripheral and connect to Concert Central
0x07	The Central SPK report Timeout while add more Peripheral SPK in Concert mode.
0x08	Both for Stereo and Concert mode, the Central SPK reports connection timeout while it is paging Peripheral SPK.
0x09	For Concert mode, the Peripheral SPK reports connecting timeout while it is sync scan to Central SPK.

*CSB\_State:*

*Length: 1 Byte*

Value	Parameter Description
0x00	eCSB is standby(paging and page_scan are disable)
0x01	eCSB is busy, the eCSB_paging is be postponed.(BT paging or SCO)
0x02	eCSB is connecting(the device is in eCSB_page_scan or eCSB_paging mode)
0x03	Creating new eCSB-link is successful.
0x04	eCSB-link is loss
0x05	Power on back to Stereo Central
0x06	Power on back to Stereo Peripheral
0x07	eCSB change from Central connecting to Peripheral connecting
0x08	eCSB disconnect by NFC
0x09	eCSB has connected to SPK1 and connecting to SPK2

*CSB\_Group\_Number:*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	The number of connected Peripheral speaker. This parameter is only valid when CSB_State is 0x03.

*CSB\_address:*

*Length: 6 Bytes*

Value	Parameter Description
0XXXXXXXXXXXXX	This parameter indicates the BT Address of connected CSB device. Little endian. This parameter is only valid when CSB_State is 0x03. e.g. 0x102030405060 is 60:50:40:30:20:10

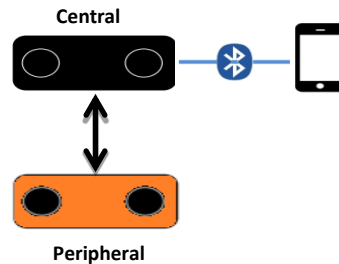
[\[Return to event Table\]](#)

### 7.45 Report\_MSPK\_Vendor\_Event (0x34)

Event	Event Code	Event Parameters
Report_MSPK_Vendor_Event	0x34	SPK_index, Payload_length, Payload

#### Description:

This event is used to report the vendor\_event from remote speaker to MCU



#### Event Parameters:

*SPK\_Index: in Concert Mode*

*Length: 1 Byte*

Value	Parameter Description
0x00	the Peripheral SPK receive vendor cmd form the Central SPK
0xFF	When payload length >9 bytes, BTM always returns 0xFF to MCU

*SPK\_Index: in Stereo mode*

*Length: 1 Byte*

Value	Parameter Description
0x01	the Peripheral SPK(SPK2) receive vendor cmd form the Central SPK
0x02	the Central SPK(SPK1) receive vendor cmd from the Peripheral SPK

*Payload\_Length:*

*Length: 2 Byte*

## Audio UART Command Set

Value	Parameter Description
0xFFFF	Payload Length byte 0:higher byte of length byte 1:lower byte of length

*Note: Peripheral speaker only send 1 byte (0x01~0x1F) data to Central, the Payload\_length is 0x0001*

*Payload: Length: N*

*Bytes*

Value	Parameter Description
0xFFFFFFFF	Vendor command from Central SPK or Vendor command from Peripheral SPK ( <i>only send 1 byte (0x01~ 0x1F) data</i> )

[\[Return to event Table\]](#)

### 7.46 Report\_MSPK\_Audio\_Setting (0x35)

Event	Event Code	Event Parameters
Report_MSPK_Audio_Setting	0x35	Audio_Effect_Type, Audio_Effect_Value

#### Description:

This event is used for Peripheral SPK to report current synced audio setting while Central SPK uses command [0x2C MSPK\\_Sync\\_Audio\\_Effect](#).

#### Event Parameters:

*Audio\_Effect\_Type: Length: 1 Byte*

Value	Parameter Description
0xFF	Vendor defined audio effect type

*Audio\_Effect\_Value: Length: 1 Byte*

Value	Parameter Description
0xFF	Audio effect value

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### 7.47 Report\_Sound\_Effect\_Status (0x36)

Event	Event Code	Event Parameters
Report_Sound_Effect_Status	0x36	Sound_Type, Sound_Status

#### Description:



## Audio UART Command Set

This event is used to report sound effect status.

Note: This event is not supported in MSPKv2 and Audio Transceiver, etc. Please reference to “Event” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information.

### Event Parameters:

*Sound\_Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	AUDIO EFFECT
0x01	3D EFFECT
0x02	RX NR
0x03	TX NR
others	reserved

*Sound\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Sound status

[\[Return to event Table\]](#)

### 7.48 Report\_Vendor\_Stored\_Data (0x37)

Event	Event Code	Event Parameters
Report_Vendor_Stored_Data	0x37	Parameter

### Description:

This event is used to report vendor stored data.

### Event Parameters:

*Parameter:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Vendor stored data

[\[Return to event Table\]](#)

### 7.49 Report\_IC\_Version\_Info (0x38)

Event	Event Code	Event Parameters
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## Audio UART Command Set

Report_IC_Version_Info	0x38	Body_Version, Rom_Version, Rom_Sub_Version, Segment, EEPROM,Table_Version, EEPROM_Table_Sub_Version, DSP_Version
------------------------	------	------------------------------------------------------------------------------------------------------------------

### Description:

This event is used to report IC Version information.

### Event Parameters:

*Body\_Version:* *Length:14*

*Bytes*

Value	Parameter Description
0xXX	body version

*Rom\_Version:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Rom Version

*Rom\_Sub\_Version:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Rom Sub-Version

*Segment:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Segment

*EEPROM\_Table\_Version:* *Length: 1 Byte*

Value	Parameter Description
0xXX	EEPROM Table Version

*EEPROM\_Table\_Sub\_Version:* *Length: 1 Byte*

Value	Parameter Description
0xXX	EEPROM Table Sub-Version

*DSP\_Version:* *Length: 2 Bytes*

Value	Parameter Description
0xXX	DSP Version

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.50 Report\_LE\_GATT\_Event (0x39)

Event	Event Code	Event Parameters
Report_LE_GATT_Event	0x39	Sub_Event_Type, Parameter

### Description:

This event will indicate host about the GATT events from remote device and responses for local Gatt commands. This event contains the sub event for specific gatt events. The sub events are detailed as below:

NOTE: The handle and UUID data is reported in reverse byte order.

### 7.50.1 Client\_write\_char\_value (0x00)

This event is used to inform MCU that GATT Client has written a Characteristic Value to **FW**.

Event	Sub-Event Code	Event Parameters
Client_Write_Characteristic_Value	0x00	Connection_Handle, Characteristic_Value_Handle, Characteristic_Value

### Event Parameters:

*Connection\_Handle:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Characteristic\_Value\_Handle:* *Length: 2 Bytes*

Value	Parameter Description
0xXX	Characteristic Value Handle

*Characteristic\_Value:* *Length: N Bytes*

Value	Parameter Description
0xXX	Characteristic Value

### 7.50.2 Read\_Local\_Char\_Value\_Res (0x01)

This event is used to report local characteristic value to host. This event is triggered in response to any of the below commands.

## Audio UART Command Set

- [Read Local Characteristic Value](#)

Event	Sub-Event Code	Event Parameters
Read_Local_Char_Value _Res	0x01	Connection_Handle, Characteristic_Value_Handle, Characteristic_Value

### Event Parameters:

*Connection\_Handle:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Characteristic\_Value\_Handle:* *Length: 2 Bytes*

Value	Parameter Description
0xXX	Characteristic Value Handle

*Characteristic\_Value:* *Length: N Bytes*

Value	Parameter Description
0xXX	Characteristic Value

### 7.50.3 Discover\_All\_Primary\_Services\_Res (0x02)

This event is used to report a list of all primary services to host. This event is triggered in response to any of the below commands.

- [Read\\_Local\\_All\\_Primary\\_Services](#)

Event	Sub-Event Code	Event Parameters
Discover_All_Primary_S ervices_Res	0x02	Connection_Handle, Attribute_Data

### Event Parameters:

*Connection\_Handle:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Attribute\_Data:* *Length: 6 to 20 Bytes*

The Attribute Data field is comprised of a list of attribute data.

Length	Start Group Handle	End Group Handle	Service UUID
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## Audio UART Command Set

1 Byte	2 Bytes	2 Bytes	(Length -4) Bytes
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### 7.50.4 Discover\_Specific\_Primary\_Service\_Characteristics\_Res (0x03)

This event is used to report a list of all characteristics of a specific service to host. This event is triggered in response to any of the below commands.

- [Read Local Specific Primary Service](#)

Event	Sub-Event Code	Event Parameters
Discover_Specific_Primary_Service_Characteristics_Res	0x03	Connection_Handle, Length, Attribute_Data

#### Event Parameters:

*Connection\_Handle:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Length:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The size of each attribute handle-value pair

*Attribute\_Data:* *Length: 2 to 18 Bytes*

The Attribute Data field is comprised of a list of attribute handle and value pairs for characteristic declaration.

Attribute Handle	Attribute Value
2 Bytes	(Length -2) Bytes

Attribute Value of Characteristic Declaration:

Attribute Value		
Characteristic Properties	Characteristic Value Attribute Handle (2 Bytes)	Characteristic UUID (2 or 16 Bytes)

Properties	Value
Broadcast	0x01

## Audio UART Command Set

Read	0x02
Write Without Response	0x04
Write	0x08
Notify	0x10
Indicate	0x20
Authenticated Signed Writes	0x40
Extended Properties	0x80

### 7.50.5 Discover\_All\_Characteristic\_Descriptors\_Res (0x04)

This event is used to report a list of all characteristic descriptors of a specific service to host. This event is triggered in response to any of the below commands.

- [Read Local Specific Primary Service](#)

Event	Sub-Event Code	Event Parameters
Discover_All_Characteristic_Descriptors_Res	0x04	Connection_Handle, Format, Information_Data

#### Event Parameters:

*Connection\_Handle:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Connection Handle

*Format:* *Length: 1 Byte*

Value	Parameter Description
0x01	A list of 1 or more handles with their 16-bit Bluetooth UUIDs
0x02	A list of 1 or more handles with their 128-bit UUIDs

*Information\_Data:* *Length: 4 to 20 Bytes*

The information data is comprised of a list of data defined in the tables below depending on the value chosen for the format.

Handle	16-bit Bluetooth UUID
2 Bytes	2 Bytes

Format 0x01-handle and 16-bit Bluetooth UUIDs

Handle	128-bit Bluetooth UUID
2 Octets	16 Octets

Format 0x02-handle and 128-bit UUIDs

## Audio UART Command Set

### 7.50.6 Get\_Att\_MTU\_Size\_Res (0x05)

This event is used to report the Att MTU size to host. This event is triggered in response to the below command,

- [Get\\_Att\\_MTU\\_Size](#)

Event	Sub-Event Code	Event Parameters
Get_Att_MTU_Size_Res	0x05	Att_MTU_Size

#### Event Parameters:

*Att\_MTU\_Size:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Att MTU Size

[\[Return to event Table\]](#)

### 7.51 Report\_BTM\_Link\_Mode (0x3A)

Event	Event Code	Event Parameters
Report_BTM_Link_Mode	0x3A	Link_Mode_Value, CSB_Group_Number

#### Description:

This event is used to report MCU the last link mode.

#### Event Parameters:

*Link\_Mode\_Value:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Single mode
0x01	Multipoint
0x02	MSPK Central with CSB_Group_Number parameter
0x03	MSPK Peripheral
0x04	Concert Central with CSB_Group_Number parameter
0x05	Concert Peripheral

*CSB\_Group\_Number:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The number of connected Peripheral speaker. This parameter is only valid when CSB_State is 0x03.

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## Audio UART Command Set

### 7.52 Report\_MSPK\_MISC\_Event (0x3C)

Event	Event Code	Event Parameters
Report_MSPK_MISC_Event	0x3C	Type, Parameters

#### Description:

This event is used to report MSPK MISC Event (can be used by customer to report some special event).

#### Event Parameters:

*Type:* *Length: 1 Byte*

Value	Type Description
0x00	mspk group status
0x01-0xFF	reserved

Type = 0

*Model Type:* *Length: 1 Byte*

Value	Parameters Description
0	same model
1	different model

*Group ID:* *Length: 4 Bytes*

Value	SubEvent Payload Description
0xNNNNNNNN	SHA1 of Central's BD_ADDR

*Number of Group:* *Length: 1 Bytes*

Value	SubEvent Payload Description
0-255	Number of Group

[\[Return to event Table\]](#)

### 7.53 Report\_MSPK\_Exchange\_Link\_info (0x3D)

Event	Event Code	Event Parameters
Report_MSPK_Exchange_Link_Inf	0x3D	Exchanged_data
0		

#### Description:

This event is used to report the exchanged data of CSB link creation. It will be reported after CSB link is connected.



## Audio UART Command Set

### Event Parameters:

Exchanged\_data

Size : 7 Bytes

Value	SubEvent Type Description
0xNN	Model ID
0xNN	Model Number
0xNN	Color
0xNNNNNNNN	Four bytes unique id

[\[Return to event Table\]](#)

### 7.54 Report\_Customized\_Information (0x3E)

Event	Event Code	Event Parameters
Report_Customized_Information	0x3E	payload_type payload

### Description:

This event is used to report the specified information for customization.

Note: This command is only supported in ODM project. Please reference to “Event” sheet in AudioUARTCommandSet\_Summary\_table\_V2.x.xlsx for more detail support information

### Event Parameters:

payload\_type

Size : 1 Bytes

Value	SubEvent Type Description
0x00	Report Unique ID
0x01	Report remote BT address
0x02	Report BLE Tx power
Others	Reserved

payload\_type = 0x00 Unique  
ID : payload

Size : 4 Bytes

Value	SubEvent Type Description
0xNNNNNNNN	4 byte unique ID

## Audio UART Command Set

payload\_type = 0x01 Remote  
BT address : payload

Size : 6 Bytes

Value	SubEvent Type Description
0xNNNNNNNNNNNNNN	6 bytes of remote BT address

payload\_type = 0x02 BLE Tx  
power : payload

Size : 1 Byte

Value	SubEvent Type Description
0xNN	1 byte BLE Tx power

[\[Return to event Table\]](#)

### 7.55 Report\_CSB\_CLK (0x3F)

Event	Event Code	Event Parameters
Report_CSB_CLK	0x3F	BT Clock

#### Description:

This event is used to report the BT CLOCK in CSB link. The BT clock is latched if MCU pulls up the CSB\_CLK\_LATCH\_PIN (P2\_7).

#### Event Parameters:

*Bt\_clock\_data:*

*Length: 16 Bytes*

Value	SubEvent Type Description
0xNNNN	2 bytes data, high byte is MSB byte

Example:

Received raw data “0x3F 0x12 0x34”, the “0x34” is the MSB of BT\_CLOCK, “0x12” is the LSB of BT\_CLOCK

[\[Return to event Table\]](#)

### 7.56 Report\_Read\_Feature\_List\_Reply (0x40)

Event	Event Code	Event Parameters
Report_Read_Feature_List_Reply	0x40	Feature0, Feature1, Feature2, Feature3

#### Description:

## Audio UART Command Set

This event is used to reply the Read\_Feature\_List command to indicate the features supported or not.

### Event Parameters:

*Feature0:* *Length: 1 Byte*

Value	Parameter Description
0xXX	1 indicates supported; 0 indicates non-supported Bit0 : Stereo Mode Bit1 : Concert Mode Bit2 : Embedded Application Mode  Bit3 : Battery Level Indication Bit4 – Bit7: reserved

*Feature1:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

*Feature2:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

*Feature3:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[\[Return to event Table\]](#)

### 7.57 REPORT\_TEST\_RESULT\_REPLY (0x41)

Event	Event Code	Event Parameters
REPORT_TEST_RESULT_REPLY	0x41	opcode, status

# Audio UART Command Set

## Description:

This event is used to report the test result of the UART\_CMD\_TEST\_DEVICE.

## Event Parameters:

*opcode:*

*Length: 1 Byte*

Value	Parameter Description
0x00	CP test result

*status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Success
0x01	Error

[\[Return to event Table\]](#)

## 7.58 Report\_Read\_EEPROM\_Data (0x42)

Event	Event Code	Event Parameters
Report_Read_EEPROM_Data	0x42	Parameter

## Description:

This event is used to report the EEPROM data by sending the read EEPROM data command ([0x3C](#)).

## Event Parameters:

*Parameter:*

*Length: 1 to 16 Bytes*

Value	Parameter Description
0xXX...	EEPROM data

[\[Return to event Table\]](#)

## 7.59 PBAPC\_Event (0x43)

Event	Event Code	Event Parameters	Return Event
PBAP_Client_Event	0x43	Type, Total_Length, Payload_Length, Payload (Sub_EventCode + Parameters)	

# Audio UART Command Set

## Description:

This event is used to send PBAP related event to host MCU.

## Event Parameters:

*Type:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Single packet
0x01	Fragmented start packet
0x02	Fragmented continue packet
0x03	Fragmented end packet

*Total\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Total payload length

*Payload\_Length:*

*Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Payload length in this packet

*Payload:*

*Length: N*

*Bytes*

Value	Parameter Description
0xFFFF...	Payload

The detail definition of payload is described in 7.59.1~ 7.59.9.

## 7.59.1 PBAP\_Session\_Opened

Event	Sub Event Code	Event Parameters
PBAP_Session_Opened	0x00	Device_Identifier, Status

## Description:

This event is used to notify the result of PBAP session establishment.

## Event Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description

## Audio UART Command Set

0xXX	Device Identifier
------	-------------------

Status:

Length: 1 Byte

Value	Parameter Description
-------	-----------------------

0x00	Connection establish successfully
------	-----------------------------------

0x01	Connection establish fail
------	---------------------------

[\[Return to event Table\]](#)

### 7.59.2 PBAP\_Session\_Disconnected

Event	Sub Event Code	Event Parameters
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PBAP_Session_Disconnected	0x01	Device_Identifier
---------------------------	------	-------------------

#### Description:

This event is used to notify the PBAP session is disconnected.

#### Event Parameters:

Device\_Identifier:

Length: 1

Byte

Value	Parameter Description
-------	-----------------------

0xXX	Device Identifier
------	-------------------

[\[Return to event Table\]](#)

### 7.59.3 Pull\_Phone\_Book\_Rsp

Event	Sub Event Code	Event Parameters
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Pull_Phone_Book_Rsp	0x02	Device_Identifier, Is_End_Of_Body, Supp_App_Para_Flag Phone_Book_Size, New_Missed_Calls ,Primary_Ver_Counter, Secondary_Ver_Counter, Database_Id, Object_Data_Body
---------------------	------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### Description:

This event is used to reply a phone object.

#### Event Parameters:

# Audio UART Command Set

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description
0xXX	Device Identifier

*Is\_End\_Of\_Body:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	0: there will be more packets.  1: this is the last data packet.

*Supp\_App\_Para\_Flag:*

*Length: 2 Bytes*

Bit	Parameter Description
Bit7:	Phone_Book_Size_Flag 0: Phone_Book_Size is invalid 1: Phone_Book_Size is valid
Bit8:	Primary_Ver_Counter_Flag 0: Primary_Ver_Counter is invalid 1: Primary_Ver_Counter is valid
Bit 9:	Secdonary_Ver_Counter_Flag 0: Secdonary_Ver_Counter is invalid 1: Secdonary_Ver_Counter is valid
Bit 11	Database_Id_Flag 0: Database_Id is invalid 1: Database_Id is valid

*Phone\_Book\_Size:*

*Length: 2 Byte*

Value	Parameter Description
0XXXXX	This is used in the response when the value of MaxListCount in the request is 0. It shall contain the number of indexes.

*New\_Missed\_Calls:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	This application parameter shall be used in the response when and only when the phone book object is mch. It indicates the number of missed calls that have

## Audio UART Command Set

been received on the PSE since the last PullPhoneBook request on the mch folder, at the point of the request.

*Primary\_Ver\_Counter:*

*Length: 16 Byte*

Value	Parameter Description
0xXX	Primary version counter

*Secdonary\_Ver\_Counter:*

*Length: 16 Byte*

Value	Parameter Description
0xXX	Secondary version counter

*Database\_Id:  
Byte*

*Length: 16*

Value	Parameter Description
0xXX	Database Id

*Object\_Data\_Body:*

*Length: XXXX Byte*

Value	Parameter Description
0xXX XX XX	This is vard-listing object data in UTF-8.

[\[Return to event Table\]](#)

### 7.59.4 Pull\_Vcard\_Listing\_Rsp

Event	Sub Event Code	Event Parameters
Pull_Vcard_Listing_Res	0x03	Device_Identifier, Is_End_Of_Body, Supp_App_Para_Flag Phone_Book_Size, New_Missed_Calls ,Primary_Ver_Counter, Secondary_Ver_Counter, Database_Id, Object_Data_Body

#### Description:

This event is used to reply the list of Phone Book entries.



# Audio UART Command Set

## Event Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description
0xXX	Device Identifier

*Is\_End\_Of\_Body:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	0: there will be more packets.  1: this is the last data packet.

*Supp\_App\_Para\_Flag:*

*Length: 2 Bytes*

Bit	Parameter Description
Bit7:	Phone_Book_Size_Flag 0: Phone_Book_Size is invalid 1: Phone_Book_Size is valid
Bit8:	Primary_Ver_Counter_Flag 0: Primary_Ver_Counter is invalid 1: Primary_Ver_Counter is valid
Bit 9:	Secdonary_Ver_Counter_Flag 0: Secdonary_Ver_Counter is invalid 1: Secdonary_Ver_Counter is valid
Bit 11	Database_Id_Flag 0: Database_Id is invalid 1: Database_Id is valid

*Phone\_Book\_Size:*

*Length: 2 Byte*

Value	Parameter Description
0xFFFF	This is used in the response when the value of MaxListCount in the request is 0. It shall contain the number of indexes.

*New\_Missed\_Calls:*

*Length: 1 Byte*

Value	Parameter Description
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## Audio UART Command Set

0xXX	This application parameter shall be used in the response when and only when the phone book object is mch. It indicates the number of missed calls that have been received on the PSE since the last PullPhoneBook request on the mch folder, at the point of the request.
------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

*Primary\_Ver\_Counter:*

*Length: 16 Byte*

Value	Parameter Description
0xXX	Primary version counter

*Secdonary\_Ver\_Counter:*

*Length: 16 Byte*

Value	Parameter Description
0xXX	Secondary version counter

*Database\_Id:*

*Length: 16*

*Byte*

Value	Parameter Description
0xXX	Database Id

*Object\_Data\_Body:*

*Length: XXXX Byte*

Value	Parameter Description
0xXX XX XX	This is vard-listing object data in UTF-8.

[\[Return to event Table\]](#)

### 7.59.5 Pull\_Vcard\_Entry\_Rsp

Event	Sub Event Code	Event Parameters
Pull_Vcard_Entry_Res	0x04	Device_Identifier, Is_End_Of_Body, Supp_App_Para_Flag Database_Id, Object_Data_Body

#### Description:

This event is used to reply a Phone Book entry.

# Audio UART Command Set

## Event Parameters:

*Device\_Identifier:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Device Identifier

*Is\_end\_Of\_Body:* *Length: 1 Byte*

Value	Parameter Description
0xXX	0: there will be more packets.  1: this is the last data packet.

*Supp\_App\_Para\_Flag:* *Length: 2 Bytes*

Bit	Parameter Description
Bit 11	Database_Id_Flag 0: Database_Id is invalid 1: Database_Id is valid

*Database\_Id:* *Length: 16 Byte*

Value	Parameter Description
0xXX	Database Id

*Object\_Data\_Body:* *Length: XXXX Byte*

Value	Parameter Description
0xXX XX XX ...	This is vCard object data in UTF-8.

[\[Return to event Table\]](#)

## 7.59.6 Set\_Phone\_Book\_Rsp

Event	Sub Event Code	Event Parameters
Set_Phone_Bbook_Res	0x05	Device_Identifier

### Description:

This event is used to reply the result of **set current folder request**.

# Audio UART Command Set

## Event Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description
0xXX	Device Identifier

[\[Return to event Table\]](#)

## 7.59.7 Abort\_Rsp

Event	Sub Event Code	Event Parameters
Abort_Rsp	0x06	Device_Identifier

### Description:

This event is used to reply the result of **abort** request.

## Event Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description
0xXX	Device Identifier

[\[Return to event Table\]](#)

## 7.59.8 Error\_Rsp

Event	Sub Event Code	Event Parameters
Error_Rsp	0x07	Device_Identifier, Response_Code

### Description:

This event is used to reply the result of **set current folder** request.

## Event Parameters:

*Device\_Identifier:*

*Length: 1*

*Byte*

Value	Parameter Description

# Audio UART Command Set

0xXX	Device Identifier
------	-------------------

*Response\_Code:*

*Length: 1*

*Byte*

Value	Parameter Description
0x30	Multiple Choices
0x31	Moved Permanently
0x32	Moved temporarily
0x33	See Other
0x34	Not Modified
0x35	Use Proxy
0x40	Bad Request
0x41	Unauthorized
0x42	Payment required
0x43	Forbidden
0x44	Not Found
0x45	Method not allowed
0x46	Not Acceptable
0x47	Proxy Authentication required
0x48	Request Time Out
0x49	Conflict
0x4a	Gone
0x4b	Length Required
0x4c	Precondition failed
0x4d	Requested entity too large

## Audio UART Command Set

0x4e	Request URL too large
0x4f	Unsupported media type
0x50	Internal Server Error
0x51	Not Implemented
0x52	Bad Gateway
0x53	Service Unavailable
0x54	Gateway Timeout
0x55	HTTP version not supported
0x60	Database Full
0x61	Database Locked

[\[Return to event Table\]](#)

### 7.59.9 Supported\_Features

Event	Sub Event Code	Event Parameters
Supported_Features	0x08	Device_Identifier, Supported_Respositories, Supported_Features, Profile_Version

#### Description:

This event is used to notify information about remote device PBAP supported features

This event is available if profile version is 1.2

#### Event Parameters:

*Device\_Identifier:* *Length: 1*  
*Byte*

Value	Parameter Description
0xXX	Device Identifier

*Supported\_Respositories:* *Length: 1*  
*Byte*

## Audio UART Command Set

Value	Parameter Description
Bit 0	Supported Repositories: Local Phonebook
Bit 1	Supported Repositories: SIM card
Bit 2	Supported Repositories: Speed dial
Bit 3	Supported Repositories: Favorites

*Supported\_Features:*

*Length: 4 Byte*

Value	Parameter Description
Bit 0	Supported Feature: Download
Bit 1	Supported Feature: Browsing
Bit 2	Supported Feature: Database Identifier
Bit 3	Supported Feature: Folder Version Counters
Bit 4	Supported Feature: vCard Selecting
Bit 5	Supported Feature: Enhanced Missed Calls
Bit 6	Supported Feature: X-BT-UCI vCard Property
Bit 7	Supported Feature: X-BT_UID vCard Property
Bit 8	Supported Feature: Contact Referencing
Bit 9	Supported Feature: Default Contact Image Format

*Profile\_Version:*

*Length: 2 Byte*

Value	Parameter Description
0xFFFF	The PBAP Version  The high byte is Major version, the low byte is Minor version  e.g. 0x0102 means PBAP 1.2

## Audio UART Command Set

[\[Return to event Table\]](#)

### 7.60 AVRCP\_Browsing\_Event (0x44)

Event	Event Code	Event Parameters
AVRCP_Browsing_event	0x44	Type, Total_Length, Payload_Length, Payload (Sub_EventCode + Parameters)

#### Description:

This event is used to send AVRCP Browsing related event to host MCU.

#### Event Parameters:

*Type:* *Length: 1 Byte*

Value	Parameter Description
0x00	Single packet
0x01	Fragmented start packet
0x02	Fragmented continue packet
0x03	Fragmented end packet

*Total\_Length:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Total payload length

*Payload\_Length:* *Length: 2 Bytes*

Value	Parameter Description
0xFFFF	Payload length in this packet

*Payload:* *Length: N Bytes*

Value	Parameter Description
0xFFFF...	Payload

The detail definition of payload is described in 7.59.1~ 7.59.9.



# Audio UART Command Set

## 7.60.1 GetFolderItems\_Rsp

Event	Sub Event Code	Event Parameters
GetFolderItems_Rsp	0x00	Data_Base_Index, Status, UIDCounter, Items_Num, List_len, ItemList

### Description:

This event is used to notify the response of GetFolderItems command (5.2.60.1).

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetFolderItems operation. Refer to 7.60.16.

*UIDCounter:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The UID Counter.

*Items\_Num:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The number of items returned in this listing.

*List\_len:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The length of returned items in this listing.

*ItemList:* *Length: N Byte*

Value	Parameter Description
0xXX...	The attributes returned with each item shall be the supported attributes from the list provided in the attribute list parameter of the request. Refer to AVRCP Specification <a href="#">[5]</a> for detail information.

## Audio UART Command Set

[\[Return to event Table\]](#)

### 7.60.2 GetTotalNumberOfItems\_Rsp

Event	Sub Event Code	Event Parameters
GetTotalNumberOfItems_Rsp	0x01	Data_Base_Index, Status, UIDCounter, Items_Num

#### Description:

This event is used to notify the response of GetTotalNumberOfItems command (5.2.60.2).

#### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetTotalNumberOfItems operation. Refer to 7.60.16.

*UIDCounter:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The UID Counter.

*Items\_Num:* *Length: 4 Byte*

Value	Parameter Description
0xFFFFFFFF	The number of items in this folder/scope.

[\[Return to event Table\]](#)

### 7.60.3 SetAddressedPlayer\_Rsp

Event	Sub Event Code	Event Parameters
-------	----------------	------------------

## Audio UART Command Set

SetAddressedPlayer	0x02	Data_Base_Index, Response, Status
_Rsp		

### Description:

This event is used to notify the response of SetAddressedPlayer command (5.2.60.3).

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Response:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Response type: 0x08: Not implement 0x09: Accept 0x0A: Reject 0x0C: Stable 0x0D: Changed 0x0F: Interim

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the SetBrowsedPlayer operation. Refer to 7.60.16.

[\[Return to event Table\]](#)

### 7.60.4 SetBrowsedPlayer\_Rsp

Event	Sub Event Code	Event Parameters
SetBrowsedPlayer _Rsp	0x03	Data_Base_Index, Status, UIDCounter, Items_Num, Char_Set_Id, Folder_Depth, Total_Folder_List_Len, Folder_List

### Description:

This event is used to notify the response of SetBrowsedPlayer command (5.2.60.4).

# Audio UART Command Set

## Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the SetBrowsedPlayer operation. Refer to 7.60.16.

*UIDCounter:* *Length: 2 Byte*

Value	Parameter Description
0XXXXX	The UID Counter.

*Items\_Num:* *Length: 4 Byte*

Value	Parameter Description
0XXXXXXXXX	If the SetBrowsedPlayer succeeded, the number of items in the current folder. If the SetBrowsedPlayer did not success, the value of this parameter shall be ignored.

*Char\_Set\_Id:* *Length: 2 Byte*

Value	Parameter Description
0XXXXX	Specifies the character set ID to be displayed on CT.

*Folder\_Depth:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The number of Folder Name Length/Folder Name pairs which follow.

*Total\_Folder\_List\_Len:* *Length: 2 Byte*

Value	Parameter Description
0XXXXX	Total length of the following Folder Name Length/Folder Name pairs.

*Folder\_List:* *Length: Total\_Folder\_List\_Len Byte*

Value	Parameter Description
0XXXXX...	The list of Folder Name Length/Folder Name pairs. Refer to AVRCP Specification <a href="#">[5]</a> for detail information.

For example, if Folder\_Depth = 0x03, Total\_Folder\_List\_Len = 0x0C, Folder\_List = 0x00 01 41 00 02 42 43 00 03 44 45 46,

## Audio UART Command Set

It means there are 3 Folder Name Length/Folder Name pairs :

Folder_Depth	Total_Folder_List_Len	Folder Name Length	Folder Name	Folder Name Length	Folder Name	Folder Name Length	Folder Name
0x03	0x0C	0x0001	0x41 ('A')	0x0002	0x42 0x43 ('BC')	0x0003	0x44 0x45 0x46 ('DEF')

[\[Return to event Table\]](#)

### 7.60.5 ChangePath\_Rsp

Event	Sub Event Code	Event Parameters
ChangePath_Rsp	0x04	Data_Base_Index, Status, Items_Num

#### Description:

This event is used to notify the response of ChangePath command (5.2.60.5).

#### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the ChangePath operation. Refer to 7.60.16.

*Items\_Num:* *Length: 4 Byte*

Value	Parameter Description
0XXXXXXXX	If the ChangePath succeeded, the number of items in the folder which has been changed to.

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.60.6 GetItemAttributes\_Rsp

Event	Sub Event Code	Event Parameters
GetItemAttributes Rsp	0x05	Data_Base_Index, Status, Attr_Num, Total_Attr_List_Len, Attr_List

### Description:

This event is used to notify the response of GetItemAttributes command (5.2.60.6).

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetItemAttributes operation. Refer to 7.60.16.

*Attr\_Num:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The number of Attribute Value Entries in the following Attribute Value Entry list.

*Total\_Attr\_List\_Len:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The total length of attributes.

*Attr\_List:* *Length: Total\_Attr\_List\_Len*

Value	Parameter Description
0xFFFF...	Attribute Value Entry list. Refer to AVRCP Specification <a href="#">[5]</a> for detail information.

For example, if Item\_Num = 0x03, it means there are 3 Attributes :

		Attribute 1				Attribute 2				Attribute 3			
Attr_Num (0x03)	Total_Attr_List_Len	Attr ID	Char Set ID	Attr value length	Attr value	Attr ID	Char Set ID	Attr value length	Attr value	Attr ID	Char Set ID	Attr value length	Attr value

# Audio UART Command Set

[\[Return to event Table\]](#)

## 7.60.7 Search\_Rsp

Event	Sub Event Code	Event Parameters
Search_Rsp	0x06	Data_Base_Index, Status, UIDCounter, Items_Num

### Description:

This event is used to notify the response of Search command (5.2.60.7).

### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Status:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetItemAttributes operation. Refer to 7.60.16.

*UIDCounter:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The UID Counter.

*Items\_Num:* *Length: 4 Byte*

Value	Parameter Description
0xFFFFFFFF	The number of media element items found in the search.

[\[Return to event Table\]](#)

## 7.60.8 PlayItem\_Rsp

Event	Sub Event Code	Event Parameters
PlayItem_Rsp	0x07	Data_Base_Index, Response, Status

## Audio UART Command Set

### Description:

This event is used to notify the response of PlayItem command (5.2.60.8).

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response type: 0x08: Not implement 0x09: Accept 0x0A: Reject 0x0C: Stable 0x0D: Changed 0x0F: Interim

*Status:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetItemAttributes operation. Refer to 7.60.16.

[\[Return to event Table\]](#)

### 7.60.9 AddToNowPlaying\_Rsp

Event	Sub Event Code	Event Parameters
AddToNowPlaying_Rsp	0x08	Data_Base_Index, Response, Status

### Description:

This event is used to notify the response of AddToNowPlaying command (5.2.60.9).

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*



## Audio UART Command Set

Value	Parameter Description
0xXX	Linked device index

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response type: 0x08: Not implement 0x09: Accept 0x0A: Reject 0x0C: Stable 0x0D: Changed 0x0F: Interim

*Status:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The result of the GetItemAttributes operation. Refer to 7.60.16.

[\[Return to event Table\]](#)

### 7.60.10 GeneralReject\_Rsp

Event	Sub Event Code	Event Parameters
GeneralReject_Rsp	0x09	Data_Base_Index, Reject_Reason

#### Description:

This event is used to notify the response of General Reject.

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Reject\_Reason:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The reason for the General Reject. Refer to 7.60.16.

## Audio UART Command Set

[\[Return to event Table\]](#)

### 7.60.11 NowPlayingContentChanged\_Notify

Event	Sub Event Code	Event Parameters
NowPlayingContentChanged_Notify	0x0A	Data_Base_Index, Response

#### Description:

This event is used to notify the content of the NowPlaying folder for the Addressed Player is changed

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response. Refer to 7.60.17.

[\[Return to event Table\]](#)

### 7.60.12 AvailablePlayerChanged\_Notify

Event	Sub Event Code	Event Parameters
NowPlayingContentChanged_Notify	0x0B	Data_Base_Index, Response

#### Description:

## Audio UART Command Set

This event is used to notify a new player becomes available to be addressed (for instance started, or installed) or if a player ceases to be available

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index.

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response. Refer to 7.60.17.

[\[Return to event Table\]](#)

### 7.60.13 AddressedPlayerChanged\_Notify

Event	Sub Event Code	Event Parameters
AddressedPlayerChanged_Notify	0x0C	Data_Base_Index, Response, PlayerId, UIDCounter

### Description:

This event is used to notify the Addressed Player has been changed.

### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index.

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response. Refer to 7.60.17.

*PlayerId:*

*Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	Unique Media Player Id.

*UIDCounter:*

*Length: 2 Byte*

Value	Parameter Description
0xXXXX	The UID Counter.

[\[Return to event Table\]](#)

### 7.60.14 UIDsChanged\_Notify

Event	Sub Event Code	Event Parameters
UIDsChanged_Notify	0x0D	Data_Base_Index, Response, UIDCounter

#### Description:

This event is used to notify the UIDs have been changed on TG.

#### Event Parameters:

*Data\_Base\_Index:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index.

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Response. Refer to 7.60.17.

*UIDCounter:*

*Length: 2 Byte*

Value	Parameter Description
0xXXXX	The UID Counter.

[\[Return to event Table\]](#)

## Audio UART Command Set

### 7.60.15 ConnectionStatus

Event	Sub Event Code	Event Parameters
ConnectionStatus	0x0E	Data_Base_Index, Status

#### Description:

This event is used to notify the AVRCP Browsing connection status.

#### Event Parameters:

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Linked device index.

*Status:* *Length: 1 Byte*

Value	Parameter Description
0x00	AVRCP browsing channel disconnected
0x01	AVRCP browsing channel connected

[\[Return to event Table\]](#)

## Audio UART Command Set

### 7.60.16 The Definition of Status Code

*Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Invalid command
0x01	Invalid parameter
0x02	Parameter content error
0x03	Internal Error
0x04	Operation completed without error
0x05	UID Changed
0x06	Reserved
0x07	Invalid Direction
0x08	Not a Directory
0x09	Does Not Exist
0x0A	Invalid Scope
0x0B	Range Out of Bounds
0x0C	Folder Item is not playable
0x0D	Media in Use
0x0E	Now Playing List Full
0x0F	Search Not Supported
0x10	Search in Progress
0x11	Invalid Player Id
0x12	Player Not Browsable
0x13	Player Not Addressed
0x14	No valid Search Results
0x15	No available players
0x16	Addressed Player Changed

[\[Return to event Table\]](#)

### 7.60.17 The Definition of AVRCP Response

*Response:*

*Length: 1 Byte*

Value	Parameter Description
0x08	Not implement
0x09	Accept
0x0A	Reject
0x0C	Stable
0x0D	Changed
0x0F	Interim

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.61 Report\_Paired\_Link\_Key\_Info (0x45)

Event	Event Code	Event Parameters
Report_Paired_Link_Key_Info	0x45	Device_Num, Link_Key_Info

### Description:

This event is used to reply the command Read\_Paired\_Link\_Key\_Info and report the link key information.

### Event Parameters:

*Device\_Num:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The number of paired devices. The value is from 0 to 8.

*Link\_Key\_Info:*

*Length: N*

*Byte*

Value	Parameter Description
0XXXXXXXX...	The information involve below values: 1. 6 bytes BD address of paired device 2. 1 bytes address type (0: public address, 1: private address) 3. 16 bytes BR/EDR link key 4. 16 bytes BLE link key It will have several pairs of above items base on the value of Device_Num.

[\[Return to event Table\]](#)

## 7.62 TWS\_CMD\_Event ( 0x53, 0x54, 0x55, 0x56, 0x57, 0x58)

Command	Opcode	Command Parameters	Return Event
REPORT_TWS_VENDOR_EVENT	0x53	Data	
REPORT_TWS_LOCAL_DEVICE_STATUS	0x54	Box_State, WST_Role, Active_MIC_Position	
REPORT_TWS_VAD_DATA	0x55	Data	
REPORT_TWS_RADIO_CONDITION	0x56	Data	
REPORT_TWS_EAR_BUD_POSITION	0x57	Position	

[\[Return to event Table\]](#)

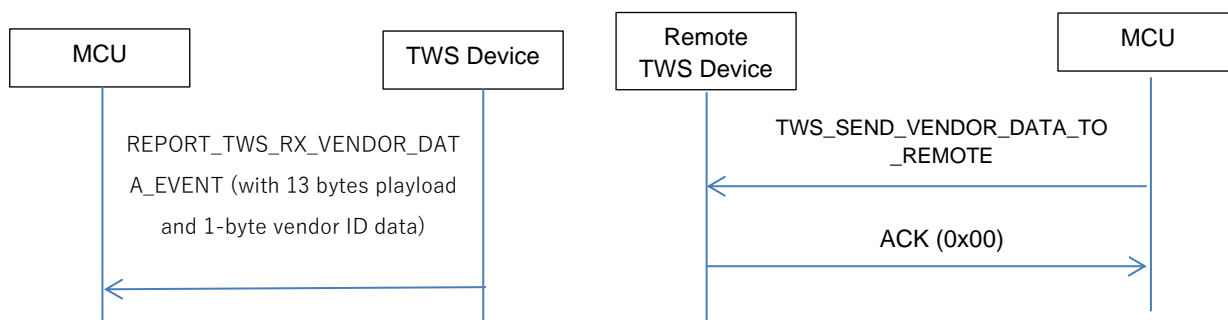
# Audio UART Command Set

## 7.62.1 Report\_TWS\_Rx\_Vendor\_Data\_Event (0x53)

Event	Event Code	Event Parameters
Report_TWS_Rx_Vendor_Data_Event	0x53	Data

### Description:

This Event reports the received VENDOR DATA packet from the remote, which is triggered by TWS\_SEND\_VENDOR\_DATA\_TO\_REMOTE.



### Precondition:

None.

### Event Parameters:

Event ID: Length: 2 Byte

Value	Parameter Description
0x53	Event OP code

Data: Length: 14 Byte

Value	Parameter Description
0x20~0x3F	Vendor ID
0xxxxxxxxxxxxxxxxxxxxxx xxxxx	Return 13 bytes from remote

[\[Return to event Table\]](#)





# Audio UART Command Set

## 7.62.2 Report\_TWS\_Local\_Device\_Status (0x54)

Event	Event Code	Event Parameters
Report_TWS_Local_Device_Status	0x54	Box_State, WST_Role, Active_MIC_Position

### Description:

This Event report the packet from WST device, which is triggered by TWS\_READ\_LOCAL\_DEVICE\_STATUS. And the event report is also triggered by any status change in TWS device status, for example the WST device is moved out or put into the charging box.

### Precondition:

None.

### Event Parameters:

*Event ID:* *Length: 1Byte*

Value	Parameter Description
0x54	Event OP code

*Box\_State:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The box state of ear bud. 0x00: System initialization state. A transition state in system initialization. 0x01: The transition state that ear bud is just putting into box 0x02: The ear bud is in in-box state 0x03: The ear bud is out of box state others: Reserved

*WST\_Role:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The WST role. 0x00: No WST record, 0x01: Temp. Single mode 0x02: WST Primary role 0x03: WST Secondary role 0x04: Fake Primary role 0x05: Transition role from Primary to Secondary 0x06: Transition role from Secondary to Primary others: Reserved

*Active\_MIC\_Position:* *Length: 1 Byte*

## Audio UART Command Set

Value	Parameter Description
0xXX	Indicate the position of active microphone in talking. 0x00: Active microphone is in Primary, 0x01: Active microphone is in Secondary others: Reserved

[\[Return to event Table\]](#)

### 7.62.3 Report\_TWS\_VAD\_Data (0x55)

Event	Event Code	Event Parameters
Report_TWS_VAD_Data	0x55	data

#### Description:

This Event reports the data which is from the DSP measures the voice signal data information in microphone. **Deprecated.**

#### Precondition:

None.

#### Event Parameters:

*Event ID:* *Length: 1Byte*

Value	Parameter Description
0x55	Event OP code

*Sub ID:* *Length: 1 Byte*

Value	Parameter Description
0x0	The data is from TWS secondary device
0x1	The data is from TWS primary device

*Data from Secondary device:* *Length: 8Byte*

Value	Parameter Description
0xxxxx	The 2 bytes Bluetooth clock, the low byte is LSB, high byte is the MSB
0xxxxxxxxxxxxxxxxxxxxxxx	This is the 11 bytes data information, and the format is
xxx	25 bits of VAD flags 16 bits of energy 1 bit flag, set by DSP to indicate done status

the 6 bytes data information

## Audio UART Command Set

Octet No.\Bits	B7	B6	B5	B4	B3	B2	B1	B0	Note
0									16 bit energy(octet 0 and octet 1)
1									
2									16 bit energy(octet 2 and octet 3)
3									
4									16 bit energy(octet 4 and octet 5)
5									
6	VAD[31]	VAD[30]	VAD[29]	VAD[28]	VAD[27]	VAD[26]	VAD[25]	VAD[24]	
7	VAD[23]	VAD[22]	VAD[21]	VAD[20]	VAD[19]	VAD[18]	VAD[17]	VAD[16]	
8	VAD[15]	VAD[14]	VAD[13]	VAD[12]	VAD[11]	VAD[10]	VAD[9]	VAD[8]	
9	VAD[7]	VAD[6]	VAD[5]	VAD[4]	VAD[3]	VAD[2]	VAD[1]	VAD[0]	
10									

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.62.4 Report\_TWS\_Radio\_Condition (0x56)

Event	Event Code	Event Parameters
Report_TWS_Radio_Condition	0x56	REPORT_TWS_RADIO_CONDITION, 0xAA, DH_DM_Through_Rate, - avg_of_highest_20_interference_power, - last_judged_ACL_rssi, TWS_rssi_X8 >> 3, TWS_rssi_spk2_sniff_phone, TWS_rssi_spk2, Piconet_Member[app_list.PM_index].preferred_rate

### Description:

This event is used to send the radio condition of Central for TWS event to host MCU.  
**Deprecated.**

### Event Parameters:

**TBD**

[\[Return to event Table\]](#)

## 7.62.5 Report\_TWS\_Ear\_Bud\_Position (0x57)

Event	Event Code	Event Parameters
Report_TWS_Ear_Bud_Position	0x57	Position

### Description:

This event is used to send TWS earbud position event to host MCU.

### Event Parameters:

*Position:* *Length: 1 Byte*

Value	Parameter Description
0x00	Unspecified.
0x01	Left earbud.

## Audio UART Command Set

0x02	Right earbud.
------	---------------

[\[Return to event Table\]](#)

### 7.62.6 Report\_TWS\_Secondary\_Device\_Status (0x58)

Event	Event Code	Event Parameters
Report_TWS_Secondary_Device_Status	0x58	Voltage_Level, Box_State

#### Description:

This Event report the packet from WST device, which is triggered by TWS\_READ\_SECONDARY\_DEVICE\_STATUS. And the event report is also triggered by any status change in TWS secondary device status, for example the TWS device battery status changes. These values are valid only when WST link is connected

#### Precondition:

None.

#### Event Parameters:

*Event ID:* *Length: 1Byte*

Value	Parameter Description
0x54	Event OP code

*Voltage\_Level:* *Length: 1 Byte*

Value	Parameter Description
0x00	batt < 3.1V
0x01	3.1V <= batt < 3.2V
0x02	3.2V <= batt < 3.3V
0x03	3.3V <= batt < 3.4V
0x04	3.4V <= batt < 3.5V
0x05	3.5V <= batt < 3.6V
0x06	3.6V <= batt < 3.7V
0x07	3.7V <= batt < 3.8V
0x08	3.8V <= batt < 3.9V
0x09	3.9V <= batt < 4.0V
0x0A	4.0V <= batt < 4.1V
0x0B	4.1V <= batt < 4.2V
0x0C	4.2V <= batt

# Audio UART Command Set

*Box\_State:*

*Length: 1 Byte*

Value	Parameter Description
0xXX	The box state of ear bud. 0x00: System initialization state. A transition state in system initialization. 0x01: The transition state that ear bud is just putting into box 0x02: The ear bud is in in-box state 0x03: The ear bud is out of box state others: Reserved

[\[Return to event Table\]](#)

## 7.63 Audio\_Transceiver\_Event (0x5A)

Event	Event Code	Event Parameters
Audio Transceiver Event	0x5A	Sub-Event Code, Event Parameters

### Description:

This event is used to indicate the information about any Audio Transceiver related event status information.

Sub Event	Sub Event Code	Sub Event Parameters
Discovery Response	0x00	BD_Address, Class_Of_Device, RSSI, Extended_Inquiry_Response
Discovery Complete	0x01	Discovery_Status
Audio Input Source	0x02	Audio Mode
Audio Application Mode	0x03	AT App Mode
Audio-In Sampling Rate	0x04	Sampling Rate

### 7.63.1 Discovery\_Response (0x00)

Event	Event Code/Event Sub-Code	Event Parameters
Discovery_Response	0x5A/0x0	BD_Address, Class_Of_Device, RSSI, Extended_Inquiry_Response

# Audio UART Command Set

## Description:

This event is used to indicate the information about Device Discovery result. Note that EIR field is only valid if event length is equal to 250 bytes. It depends on the device that is responding.

## Event Parameters:

*BD\_Address:* *Length: 6 Bytes*

Value	Parameter Description
0XXXXXXXXXXXX	BD address of the device queried

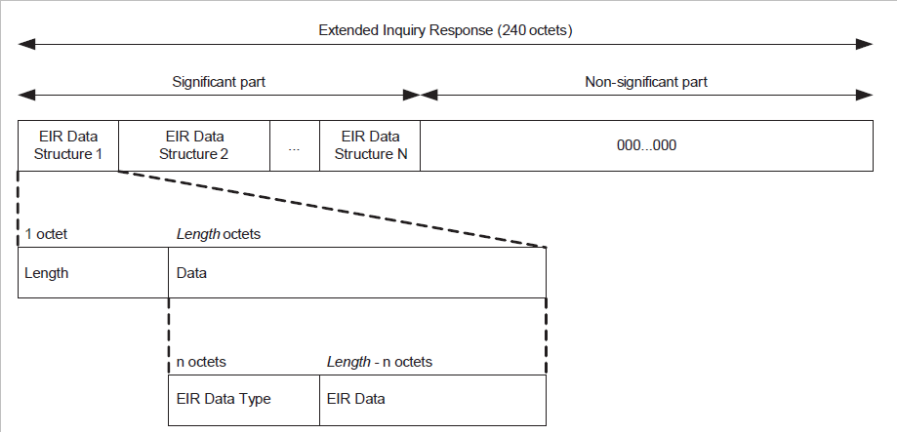
*Class\_Of\_Device:* *Length: 3 Bytes*

Value	Parameter Description
0XXXXXX	Device configuration response

*RSSI:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The RSSI value between the local device and the remote device

*Extended\_Inquiry\_Response:* *Length: 240 Bytes*

Value	Parameter Description
0XXXXXXXX...	<div><p>Extended Inquiry Response data. It is optional response from discovered devices. For further device information like Device Name, Tx Power and Service UUID will be included in this field. Below is EIR format:</p><p>See <a href="https://www.bluetooth.com/specifications/assigned-numbers/generic-access-profile/">https://www.bluetooth.com/specifications/assigned-numbers/generic-access-profile/</a> for EIR Data Type and EIR Data definition.</p></div>

[\[Return to event Table\]](#)



# Audio UART Command Set

## 7.63.2 Discovery\_Complete (0x01)

Event	Event Code/Event Sub-Code	Event Parameters
Discovery_Complete	0x5A/0x01	Discovery_Status

### Description:

This event is used to indicate the status of device discovery complete response.

### Event Parameters:

*Discovery\_Status:*

*Length: 1 Byte*

Value	Parameter Description
0x00	Success
0x01 – 0x44	Failure – refer api document for specific failure code

[\[Return to event Table\]](#)

## 7.63.3 AT\_Audio\_Input\_Source (0x02)

Event	Event Code/Event Sub-Code	Event Parameters
AT_Audio_Input_Source	0x5A/0x02	Audio Mode

### Description:

This event is used to report the audio input source.

### Event Parameters:

*Audio Mode :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Line In mode
0x01	I2S mode

[\[Return to event Table\]](#)

## 7.63.4 AT\_APP\_Mode (0x03)

Event	Event Code/Event Sub-Code	Event Parameters
AT_APP_Mode	0x5A/0x03	AT App Mode

## Audio UART Command Set

### Description:

This event is used to report the application mode.

### Event Parameters:

*AT APP Mode:*

*Length: 1 Byte*

Value	Parameter Description
0x00	TX mode
0x01	RX mode

[\[Return to event Table\]](#)

### 7.63.5 Audio-In Sampling Rate (0x04)

Event	Event Code/Event Sub-Code	Event Parameters
Audio-In Sampling Rate	0x5A/0x04	Sampling rate

### Description:

This event is used to report the Audio-in sampling rate.

### Event Parameters:

*Sampling rate:*

*Length: 1 Byte*

Value	Parameter Description
0x00	48 Khz
0x01	44.1 Khz

[\[Return to event Table\]](#)

### 7.64 Read\_Button\_MMI\_Setting\_Reply (0x5C)

Event	Event Code	Event Parameters
Read_Button_MMI_Setting_Reply	0x5C	Destination, Button Operation, Call State[i], MMI Action[i]

### Description:

This event is used to reply the Read\_Button\_MMI\_Setting\_Cmd with MMI settings. The number of pairs of Call State and MMI Action is based on the Read\_Button\_MMI\_Setting\_Cmd.

### Event Parameters:

*Destination :*

*Length: 1 Byte*

Value	Parameter Description
-------	-----------------------

# Audio UART Command Set

0x00	Local side
0x01	Left side (for WST)
0x02	Right side (for WST)

*Button Operation:*

*Length: 1 Byte*

Value	Parameter Description
0x01	Button 0 short press (MFB)
0x02	Button 0 long press (MFB)
0x03	Button 1 short press
0x04	Button 1 long press
0x05	Button 2 short press
0x06	Button 2 long press
0x07	Button 3 short press
0x08	Button 3 long press
0x09	Button 4 short press
0x0A	Button 4 long press
0x0B	Button 5 short press
0x0C	Button 5 long press
0x0D - 0x80	Reserved
0x81	Button 0 double press
0x82	Button 1 double press
0x83	Button 2 double press
0x84	Button 3 double press
0x85	Button 4 double press
0x86	Button 5 double press
0x87	Button 0 and button 1 short press at the same time
0x88	Button 0 and button 2 short press at the same time
0x89	Button 0 and button 3 short press at the same time
0x8A	Button 0 and button 4 short press at the same time
0x8B	Button 0 and button 5 short press at the same time
0x8C	Button 1 and button 2 short press at the same time
0x8D	Button 1 and button 3 short press at the same time
0x8E	Button 1 and button 4 short press at the same time
0x8F	Button 1 and button 5 short press at the same time
0x90	Button 2 and button 3 short press at the same time
0x91	Button 2 and button 4 short press at the same time
0x92	Button 2 and button 5 short press at the same time
0x93	Button 3 and button 4 short press at the same time
0x94	Button 3 and button 5 short press at the same time
0x95	Button 4 and button 5 short press at the same time
0x96	Button 0 and button 1 long press at the same time
0x97	Button 0 and button 2 long press at the same time
0x98	Button 0 and button 3 long press at the same time
0x99	Button 0 and button 4 long press at the same time

## Audio UART Command Set

0x9A	Button 0 and button 5 long press at the same time
0x9B	Button 1 and button 2 long press at the same time
0x9C	Button 1 and button 3 long press at the same time
0x9D	Button 1 and button 4 long press at the same time
0x9E	Button 1 and button 5 long press at the same time
0x9F	Button 2 and button 3 long press at the same time
0xA0	Button 2 and button 4 long press at the same time
0xA1	Button 2 and button 5 long press at the same time
0xA2	Button 3 and button 4 long press at the same time
0xA3	Button 3 and button 5 long press at the same time
0xA4	Button 4 and button 5 long press at the same time
0xA5	Button 0 triple press
0xA6	Button 1 triple press
0xA7	Button 2 triple press
0xA8	Button 3 triple press
0xA9	Button 4 triple press
0xAA	Button 5 triple press

*Call State :*

*Length: 1 Byte*

Value	Parameter Description
0x00	Standby (no talk)
0x01	Voice dial triggered
0x02	Incoming call
0x03	Outgoing call
0x04	Call active with single call
0x05	Single link with multi-call (1 active and 1 waiting)
0x06	Single link with multi-call (1 active and 1 hold)
0x07	Multiple link with multi-call (1 active and 1 waiting)
0x08	Multiple link with multi-call (1 active and 1 hold)

*MMI action :*

*Length: 1 Byte*

Value	Parameter Description
0xXX	Refer to <a href="#">MMI_Action</a> for the definition

[\[Return to event Table\]](#)

# Audio UART Command Set

## 7.65 AVRCP\_Vendor\_Dependent\_Rsp (0x5D)

Event	Event Code	Event Parameters
AVRCP_Vendor_Dependent_Rsp	0x5D	PDU ID, Data_Base_Index, Payload

### Description:

This event is used to reply [AVRCP\\_Vendor\\_Dependent\\_Cmd](#) command. Detail response information needs to refer to AVRCP Specification [\[4\]](#)

### Event Parameters:

*PDU ID:* *Length: 1 Bytes*

Value	Parameter Description
0x20	GetElementAttributes Requests the TG to provide the attributes of the element specified in the parameter. Such as title, album name, artist name...etc.

*Data\_Base\_Index:* *Length: 1 Byte*

Value	Parameter Description
0x00	database 0 for dedicate link
0x01	database 1 for dedicate link

*Payload:* *Length: N Bytes*

Value	Parameter Description
0xFFFF...	Payload

The detail definition of payload is described in 7.65.1.

### 7.65.1 GetElementAttributes\_Rsp

PDU ID	Event	Payload
0x20	GetElementAttributes	Response, IsEndofBody, Attr_Num, Total_Attr_List_Len, Attr_List

### Description:

# Audio UART Command Set

This event is used to notify the response of [GetElementAttributes](#) command.

## Event Parameters:

*Response:* *Length: 1 Byte*

Value	Parameter Description
0xXX	Response. Refer to 7.60.17.

*IsEndofBody:* *Length: 1 Byte*

Value	Parameter Description
0x00	Indicate this packet is fragmented and it's a start or continue packet
0x01	Indicate this packet is a single packet or an end packet of the fragmented packets.

*Attr\_Num:* *Length: 1 Byte*

Value	Parameter Description
0xXX	The number of Attribute Value Entries in the following Attribute Value Entry list.

*Total\_Attr\_List\_Len:* *Length: 2 Byte*

Value	Parameter Description
0xFFFF	The total length of attributes.

*Attr\_List:* *Length: Total\_Attr\_List\_Len*

Value	Parameter Description
0xFFFF...	Attribute Value Entry list. Refer to AVRCP Specification <a href="#">[5]</a> for detail information.

For example, if Item\_Num = 0x03, it means there are 3 Attributes :

		Attribute 1				Attribute 2				Attribute 3			
Attr_Num (0x03)	Total_Attr_List_Len	Attr ID	Char Set ID	Attr value length	Attr value	Attr ID	Char Set ID	Attr value length	Attr value	Attr ID	Char Set ID	Attr value length	Attr value

[\[Return to event Table\]](#)

## 7.66 Runtime\_Latency (0x5E)

Event	Event Code	Event Parameters
Runtime Latency	0x5E	Latency_Type, Latency_Value

## Audio UART Command Set

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Description:

This event is used to reply Read\_Runtime\_Latency command.

Event Parameters:

Latency\_Type:           Length: 1 Byte

Value	Parameter Description
0x00	A2DP output runtime latency (latency value is unit of microsecond)
Others	Reserved

Latency\_Value:       Length: 2 Byte

Value	Parameter Description
0xFFFF	Latency value to corresponding type, time unit is based on the latency type.

[\[Return to event Table\]](#)

# Audio UART Command Set

## 8 REVISION HISTORY

Version	Date	History	Reviser
1.00	2016/04/28	Preliminary Version. Based on UART_CommandSet_v177	Randy
1.01	2016/08/03	Base on UART_CommandSet_v192	Randy
1.02	2016/09/02	Base on UART_CommandSet_v193.	Randy

Version	Date	History	Reviser
2.00	2016/10/18	Preliminary Version. Based on UART_CommandSet_v193. Add error handling response. Remove similar/no use MMI commands shows in chapter 7. Remove BTM_Utility <a href="#">0x13</a> I2S function Add description for UART event packet format.	Randy
2.00	2017/3/14	Add <a href="#">Chapter 2.5.3</a> error handling in UART command. Add new UART command <a href="#">0x2D</a> , <a href="#">0x2F</a> , <a href="#">0x38</a> , <a href="#">0x39</a> . Add Line-in Abs_vol (0x11), connection_complete (0x12) in event <a href="#">0x1B</a> Add VP report mode in event <a href="#">0x2D</a> Add CSB_Connection_State (0x07) in event <a href="#">0x33</a> . Add new UART event <a href="#">0x40</a> . Modify description for UART command <a href="#">0x07</a> , <a href="#">0x13</a> , <a href="#">0x1E</a> , <a href="#">0x29</a> , <a href="#">0x30</a> , <a href="#">0x35</a> Modify subcommand type 0x5 description for UART command <a href="#">0x17</a> . Modify description for Event <a href="#">0x01</a> , <a href="#">0x18</a> , <a href="#">0x1A</a> , <a href="#">0x22</a> , <a href="#">0x33</a> Remove return error of MMI action ( <a href="#">0x40</a> ) Remove UART command 0x22, 0x36 Modify <a href="#">Figure 2.4.1</a> Update contents table. Modify MSPK_Vendor_Cmd ( <a href="#">0x2A</a> ). Extend payload length from <b>9</b> to <b>11</b> bytes. Modify Report_MSPK_Vendor_Event ( <a href="#">0x34</a> ). BTM returns SPK_index 0xFF when payload length > 9 bytes	Randy
2.00	2017/5/4	Add UART command <a href="#">0x3A</a>	Randy
2.00	2017/5/17	Modify UART command <a href="#">0x2D</a> Modify UART event <a href="#">0x39</a>	Randy
2.00	2017/5/23	Modify UART command <a href="#">0x12</a>	Randy
2.00	2017/5/31	Modify UART command <a href="#">0x3A</a>	Randy
2.00	2017/6/2	Add new UART event <a href="#">0x3F</a>	Randy
2.00	2017/6/9	Modify UART event <a href="#">0x3F</a>	Randy
2.00	2017/6/12	Modify UART event <a href="#">0x33</a> , <a href="#">0x3A</a>	Randy



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2.00	2017/6/19	Add UART command <a href="#">0x3B</a> Add UART event <a href="#">0x41</a>	Randy
2.00	2017/6/29	Remove UART event 0x2C Modify UART command <a href="#">0x0B</a> Modify UART event <a href="#">0x23</a>	Randy
2.01	2017/6/30	v2.01 official release	Randy
2.01	2017/6/30	Add UART command 0x40 Event 0x50. Reserve for internal test use.	Randy
2.01	2017/7/11	Modify UART command <a href="#">0x0B</a>	Randy
2.01	2017/7/13	Modify UART event <a href="#">0x33,0x3A</a>	Randy
2.01	2017/7/18	Modify UART EVENT <a href="#">0x01</a> to add the parameter 0x16 for report the BT Address	Randy
2.01	2017/7/19	Modify the description about the Command <a href="#">0x2A</a> and Event <a href="#">0x34</a>	Randy
2.01	2017/8/24	Modify UART command <a href="#">0x33</a> to add one parameter 0x09. Modify UART command <a href="#">0x13</a> to add two parameters 0x0D and <a href="#">0x0E</a> . Modify UART event <a href="#">0x3D</a> to add one event parameter. Modify UART event <a href="#">0x3E</a> to add two parameters	Randy
2.01	2017/9/1	Add USB plugged in and USB unplugged to Parameter for Utility_Function_Type <a href="#">0x04</a> .	Randy
2.01	2017/9/21	Add AVDTP start state and AVDTP suspend state to Action type of BTM_Utility_Req <a href="#">0x1B</a> .	Randy
2.01	2017/9/25	Add a new item, Exit pairing mode, to Link_Info of BTM_status.	Randy
2.01	2017/9/28	Add a new type for UART command <a href="#">0x08</a> and UART event <a href="#">0x18</a>	Randy
2.01	2017/11/21	Add a new type 0x06 for UART command <a href="#">0x16</a>	Randy
2.02	2017/12/01	Add 2 new UART command to read EEPROM data ( <a href="#">0x3C</a> ) and write EEPROM data ( <a href="#">0x3D</a> ) Add 1 new UART event <a href="#">0x42</a> to report EEPROM data	Randy
2.02	2018/01/05	Update and revise table	Randy
2.02	2018/03/08	Add new UART command ( <a href="#">0x3E</a> )	Eddy
2.02	2018/06/01	Add a new MMI_Action UART command ( <a href="#">0xFA</a> )	Kely
2.02	2018/06/14	Add two parameters in BTM_Utility_Function UART command ( <a href="#">0x13</a> ) and two parameters in Report_Customized_Information UART event ( <a href="#">0x3E</a> )	Kely
2.02	2018/08/08	Add new UART command ( <a href="#">0x3F</a> ) and event ( <a href="#">0x43</a> ) for MSPK v2.0 PBAP function	Justin
2.02	2018/09/21	Revise the UART command and event for MSPK v2.0 PBAP function	Ince
2.02	2018/10/23	Add multi-fragment mechanism for PBAP event ( <a href="#">0x43</a> )	Justin
2.02	2018/10/31	Support PBAP v1.2 command ( <a href="#">0x3F</a> ) and event ( <a href="#">0x43</a> )	Ince
2.02	2018/12/13	Revise PBAP commands and events	Ince
2.03	2018/02/13	Add new command ( <a href="#">0x41</a> ) and event ( <a href="#">0x44</a> ) for AVRCP Browsing	Justin

# Audio UART Command Set

2.03	2018/02/22	1. Add a parameter of linked device index for AVRCP Browsing command ( <a href="#">0x41</a> ) 2. Add new sub-command 5.2.60.3 3. Add new sub-event 7.60.3, 7.60.8, 7.60.9	Justin
2.03	2019/02/25	Add TWS earbud position command and event ( <a href="#">0x40</a> ) and event ( <a href="#">0x57</a> ). And sort out a TWS UART command set.	George
2.03	2019/03/15	Add new sub-event 7.60.15 for AVRCP Browsing	Justin
2.03	2019/3/19	Add a comment for UART command ( <a href="#">0x12</a> ) return error.	George
2.04	2019/05/24	Add new UART command ( <a href="#">0x42</a> ) and event ( <a href="#">0x45</a> ) Add two MMI actions MSPK_ONE_KEY_OPERATION_CONCERT_MODE and MSPK_ONE_KEY_OPERATION_STEREO_MODE	Ken
2.05	2019/08/20	Add new UART Commands ( <a href="#">0x44</a> ), ( <a href="#">0x45</a> ) and event ( <a href="#">0x5A</a> ), ( <a href="#">0x5B</a> )	Prashanth
2.05	2019/09/10	Add new UART Commands ( <a href="#">0x46</a> ), ( <a href="#">0x47</a> ), ( <a href="#">0x48</a> ) and event ( <a href="#">0x5C</a> )	Ken
2.06	2019/12/30	Add new UART Command ( <a href="#">0x49</a> )	James
2.06	2020/02/05	Add new UART command ( <a href="#">0x4A</a> ) and event ( <a href="#">0x5D</a> )	Justin
2.06	2020/02/11	Revise UART Command ( <a href="#">0x49</a> )	James
2.06	2020/02/14	Add new op code for Command ( <a href="#">0x08</a> ) and event ( <a href="#">0x18</a> )	James
2.06	2020/02/25	Revise the parameter description for UART command ( <a href="#">0x4A</a> )	Justin
2.06	2020/02/26	Revised UART command ( <a href="#">0x44</a> ), ( <a href="#">0x45</a> ) and event ( <a href="#">0x5A</a> ), ( <a href="#">0x5B</a> )	Prashanth
2.06	2020/02/26	Added UART commands ( <a href="#">0x4B</a> ), ( <a href="#">0x4C</a> ), ( <a href="#">0x4D</a> ) and events ( <a href="#">0x5E</a> ), ( <a href="#">0x5F</a> )	Arun
2.06	2020/02/26	Added MMI command ( <a href="#">0x41</a> ). Added UART command ( <a href="#">0x4E</a> ), ( <a href="#">0x4F</a> )	Prashanth
2.06	2020/04/16	Revise bit mask for add Battery Level Indication support feature in event ( <a href="#">0x40</a> )	James
2.06	2020/04/18	Corrected UART commands / Events, and minor modifications	Arun
2.06	2020/04/18	Revised and collated the audio transceiver commands and events to one command ( <a href="#">0x44</a> ) and one event ( <a href="#">0x5A</a> )	Prashanth
2.06	2020/04/18	Added SubCmd ( <a href="#">0x07</a> ) and modified return event for SubCmd ( <a href="#">0x06</a> ) by adding corresponding SubEvent ( <a href="#">0x04</a> )	Prashanth
2.06	2020/04/28	Revise description on DFU ( <a href="#">0x49</a> ) and its SubCmd Image_Validate	James
2.06	2020/04/28	1. Add the description for OP code 0x01~0x02 of command ( <a href="#">0x35</a> ) 2. Add the description for state 0x80~0x82 of event ( <a href="#">0x01</a> ) 3. Add the description for command <a href="#">0xCC</a>	Justin
2.07	2020/06/09	Added subcommand Block_A2DP_Streaming_Out ( <a href="#">0x08</a> ) to AT_CMD (Audio Transceiver Command) ( <a href="#">0x44</a> )	Prashanth

## Audio UART Command Set

<b>2.07</b>	2020/06/22	Updated description of Block_A2DP_Streaming_Out ( <a href="#">0x08</a> )	Arun
<b>2.07</b>	2020/06/23	Incorporated review comments.	Arun
<b>2.08</b>	2020/08/03	Add project target version query support in command 0x08 and event 0x18 Add MMI action ( <a href="#">0x80</a> ), ( <a href="#">0x81</a> ), ( <a href="#">0x82</a> ), ( <a href="#">0x83</a> )	James
<b>2.08</b>	2020/08/10	Added UART commands concert mode endless grouping ( <a href="#">0x4B</a> ). Added a Utility_Function_Type (0x0F) in the BTM_Utility_Function ( <a href="#">0x13</a> ). Added MMI action ( <a href="#">0xEF</a> ).	George
<b>2.08</b>	2020/09/23	Revise a typo	James
<b>2.09</b>	2020/10/29	Add two missing CSB_Connection_State(0x08, 0x09) of Report_MSPK_Link_Status ( <a href="#">0x33</a> )	James
<b>2.09</b>	2021/04/06	Add command ( <a href="#">0x4C</a> ) and Event ( <a href="#">0x5E</a> )	James
<b>2.09</b>	2021/06/18	Add Sub-Opcode ( <a href="#">0x07</a> ) Parameter Configure for Command ( <a href="#">0x3F</a> )	James
<b>2.09</b>	2021/06/23	1. MSPK replace NSPK, FW replace DSPK 2. Fix error Command/Event link 3. Make some deprecated Commands/Events as reserved 4. Add notice of product dependent in some Commands/Events description. 5. Add Chapter CRC calculating 6. Add Chapter DFU image parsing	James
<b>2.09</b>	2021/06/24	1. Revise Chapter Link Database Index 2. Add Chapter Terminology related changes 3. Terminology change, reference Chapter "Terminology releaed changes"	James

# Audio UART Command Set

## 9 DEPRECATED MMI COMMANDS

Action	Description	Remark
0x02	force end active call	Similar with MMI action 0x06
0x16	initiate HF connection	UART command (0x17)
0x18	Enable RX noise reduction when SCO ready	UART command (0x1D)
0x19	Disable RX noise reduction when SCO ready	UART command (0x1D)
0x1A	Switch RX noise reduction when SCO ready	UART command (0x1D)
0x1B	Enable TX noise reduction when SCO ready	UART command (0x1D)
0x1C	Disable TX noise reduction when SCO ready	UART command (0x1D)
0x1D	Switch TX noise reduction when SCO ready	UART command (0x1D)
0x30	increase speaker gain	UART command (0x23)
0x31	decrease speaker gain	UART command (0x23)
0x32	Play/Pause music	UART command (0x04)
0x33	Stop music	UART command (0x04)
0x34	Next song	UART command (0x04)
0x35	Previous song	UART command (0x04)
0x36	Fast forward	UART command (0x04)
0x37	Rewind	UART command (0x04)
0x38	EQ mode up	UART command (0x1C)
0x39	EQ mode down	UART command (0x1C)
0x3E	Toggle 3D effect	TBD
0x50	enter pairing mode (from power off state)	Similar with MMI action 0x5D
0x6C	link last device	UART command (0x17)
0x6D	disconnect all link	UART command (0x18)
0x6E	OHS event 1	Project related command
0x6F	OHS event 2	Project related command
0x70	OHS event 3	Project related command
0x71	OHS event 4	Project related command
0x79	force buzzer alarm	TBD
0x7B	OHS event 5	Project related command
0x7C	OHS event 6	Project related command
0xC0	OHS event 7 (for Unlimiter project)	Project related command
0xC1	OHS event 8 (for Unlimiter project)	Project related command
0xC2	OHS event 9 (for Unlimiter project)	Project related command
0xC3	OHS event 10 (for Unlimiter project)	Project related command
0xC4	OHS event 11 (for Unlimiter project)	Project related command
0xC5	OHS event 12 (for Unlimiter project)	Project related command
0xC6	OHS event 13 (for Unlimiter project)	Project related command
0xC7	OHS event 14 (for Unlimiter project)	Project related command
0xC8	OHS event 15 (for Unlimiter project)	Project related command
0xC9	OHS event 16 (for Unlimiter project)	Project related command

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<b>0xCA</b>	OHS event 17 (for Unlimiter project)	Project related command
<b>0xCB</b>	Switch DSP mode 2 or 3 (for Unlimiter project)	Project related command
<b>0xEA</b>	MSPK Central exit Aux-in SBC Encoder mode	useless
<b>0xEB</b>	MSPK dynamic creation	useless
<b>0xF0</b>	MSPK CENTRAL PAGE PERIPHERAL FOR NEW PERIPHERAL	useless
<b>0xF1</b>	MSPK PERIPHERAL ENABLE PAGE SCAN FOR NEW CENTRAL	useless
<b>0xF2</b>	MSPK PERIPHERAL USE SLOW PAGE SCAN	useless
<b>0xF3</b>	MSPK PERIPHERAL USE FAST PAGE SCAN	useless

### 10 CRC CALCULATION

```
u16 XDATA CRC_Table[] =
{
    0x0000, 0x1081, 0x2102, 0x3183,
    0x4204, 0x5285, 0x6306, 0x7387,
    0x8408, 0x9489, 0xa50a, 0xb58b,
    0xc60c, 0xd68d, 0xe70e, 0xf78f
};

u16 LibEncrypt_CalculateCRC16(u8 *buf, u32 len) large
{
    u32 j = 0;
    u16 crc = 0xFFFF;
    u8 value = 0;

    for (j = 0; j < len; j++)
    {
        value = buf[j];
        crc = (crc >> 4) ^ CRC_Table[(crc ^ value) & 0x0F];
        crc = (crc >> 4) ^ CRC_Table[(crc ^ (value >> 4)) & 0x0F];
    }
    crc = ((crc & 0xFF00) >> 8) | ((crc & 0x00FF) << 8);
    crc = ((crc & 0xF0F0) >> 4) | ((crc & 0x0F0F) << 4);
    crc = ((crc & 0xCCCC) >> 2) | ((crc & 0x3333) << 2);
    crc = ((crc & 0xAAAA) >> 1) | ((crc & 0x5555) << 1);

    return crc;
}
```

## 11 DFU IMAGE PARSING

### 11.1 DFU image header format

Header within DFU image is start from address 0x0000 and end with END ID. It is composed by many tuples of (ID, Length, Content). You can parse information of DSP (may include Voice Prompt) from specific ID and the related content. There are some other IDs are reserved for system used will not be described here.

All contents are Big Endian.

Please note the header is only supported in MSPKv2 and Audio Transceiver.

Name	ID (byte 0)	Length N (byte 1)	Content (byte 2 ~ N)
START	0x80	0x04	Flash header end address
DSP_Image_Dest	0x90	0x08	reserved
DSP_Image_FD	0x91	0x12	reserved
DSP_Image_Version	0x92	0x04	DSP version information
Voice_Prompt_FD	0xD0	0x12	reserved
END	0x81	0x04	0x23, 0x45, 0x4E, 0x44 ('#END' ASCII)

### 11.2 DFU Image layout

FW image	Start address = 0x10000 End address = 0x8FFFF
DSP+Voice Prompt image	Start address = 0x110000 End address = 0x17FFFF
Factory image	Start address = 0x6000 End address = 0x6FFF

### 11.3 Information of FW

- Image length: Counting from start address 0x10000 to end address 0x8FFFF ignore the padding byte = 0xFF to obtain the total length.
- CRC: calculating from 0x10000 to actual length of FW.

### 11.4 Information of DSP (and may include Voice Prompt)

- Image length: Counting from start address 0x110000 to end address 0x17FFFF ignore the padding byte = 0xFF to obtain the total length.
- CRC: Calculating from 0x10000 to actual length of DSP (and may include Voice Prompt).
- Image init parameter in DFU: You should parse all IDs include 0x90, 0x91 0x92 and 0xD0 from DFU image header and their corresponding content then transmit them as payload for DFU(0x49) with Dsp\_Image\_Init (Sub-Opcode = 02) command for DSP update initialization.

### 11.5 Information of factory image

- Image length: Counting from start address 0x6000 to end address 0x6FFF ignore the padding byte = 0xFF to obtain the total length.
- CRC: calculating from 0x6000 to actual length of factory image.



## 12 REFERENCES

- [1] [3GPP 27.007 v6.8.0 now supersedes and replaces ETS 300 916, "Digital cellular telecommunications system \(Phase 2+\); AT command set for GSM Mobile Equipment \(ME\) \(GSM 07.07 version 7.5.0\)"](#)
- [2] [Apple Notification Center Service v1.1 document](#)
- [3] HFP 1.5\_SPEC
- [4] AVRC 1.3\_SPEC
- [5] AVRC 1.6\_SPEC

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## 13 TERMS AND DEFINITIONS

AEC	Acoustic Echo Cancellation
ANCS	Apple Notification Center Service
A/V	A/V Audio/Video
AV/C	AV/C The AV/C Digital Interface Command Set
AVCTP	AVCTP Audio/Video Control Transport Protocol
AVRCP	AVRCP Audio/Video Remote Control Profile
EQ	Equalization
NR	Noise Reduction
NS	Noise Suppression
AT	Audio Transceiver

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## 14 TERMINOLOGY RELATED CHANGES

Old Terminology	New Terminology
Master SPK	Central SPK (Central Speaker)
Slave SPK	Peripheral SPK (Peripheral Speaker)
nSPK	MSPK
NSPK	MSPK
Master	Central
Slave	Peripheral

Please note that BTM and FW are identical meaning in this document.

SPK1 is same as Central SPK or Central Speaker.

SPK2 is same as Peripheral SPK or Peripheral Speaker.

SPK3 is same as Peripheral SPK or Peripheral Speaker.