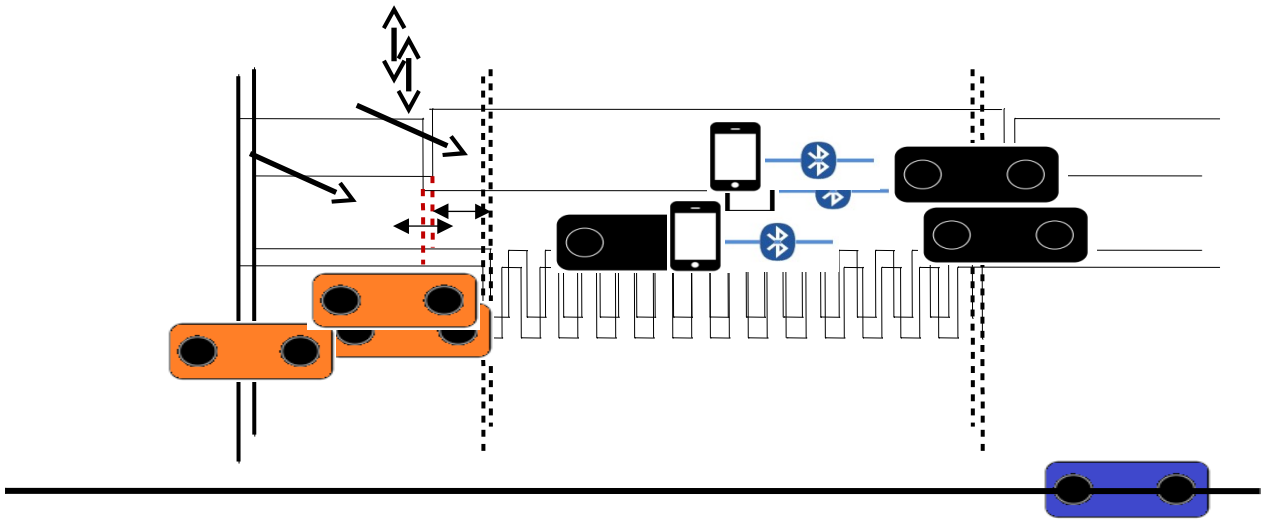


Audio UART Command Set (V2.02)

Contents

1 GENERAL DESCRIPTION

Dual Mode SPK provides UART communication interface with MCU. This document describes how MCU communicates with **Dual Mode SPK** and the behavior of **Dual Mode SPK**.

2 MCU INTERFACE

1.1 PIN definition

Name	Type	Description	BM62 Define
UART_TXD (Mandatory)	Output		HCI_TXD
UART_RXD (Mandatory)	Input		HCI_RXD
UART_TX_IND (Optional)	Output	**DSPK** inform Host MCU that UART data will be transmitted out after few ms (Setting by UI Tool, default 9.375ms)	P2_7
UART_RX_IND (Optional)	Input	Host MCU inform **DSPK** that UART data will be transmitted out after few us	Configurable

1.2 UART Protocol

The UART protocol is shown as below diagram

	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
	SINC WORD	Check sum to be calculated			
			TARGET LENGTH		

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

e.g.

	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.

	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

1.3 UART configuration

- Baud Rate Setting: 2400bps~921600bps
- No Flow Control

1.4 UART data exchange for low power mode

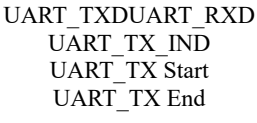
1. Signal of UART_TX_IND and UART_RX_IND are required to guarantee the correction of UART data.

UART_RX_IND
UART_RX Start
UART_RX End

$T_{uart\_rx\_ind}$

*$T_{uart\_rx\_ind}$: >2ms

Fig 2.4.1 Host MCU indicate DSPK UART data diagram



$T_{Wakeup\_External\_MCU\_Wait\_Time}$

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

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

Fig 2.4.2 DSPK indicate Host MCU UART data timing diagram

1.5 UART packet process rule

1.5.1 Command Packet Handling

For every command received from MCU, DSPK will send the ACK. If ACK is not received by MCU with in the 200ms timeout value 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 DSPK.

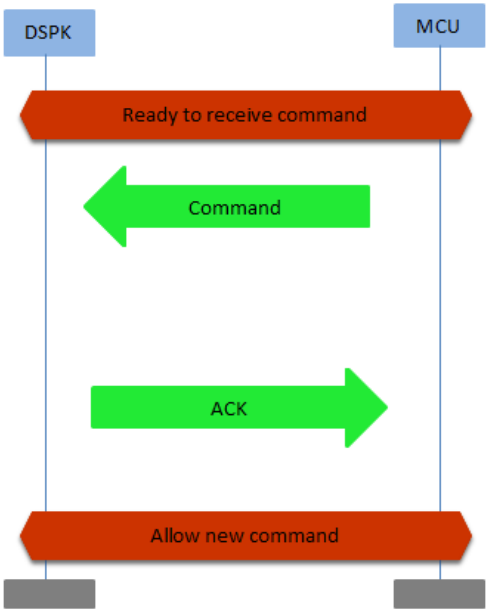


Fig 2.5.1: For the command received from MCU,DSPK sent an ACK

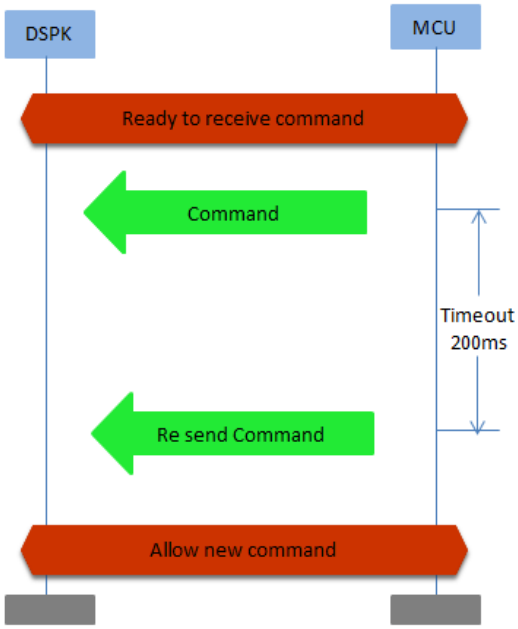
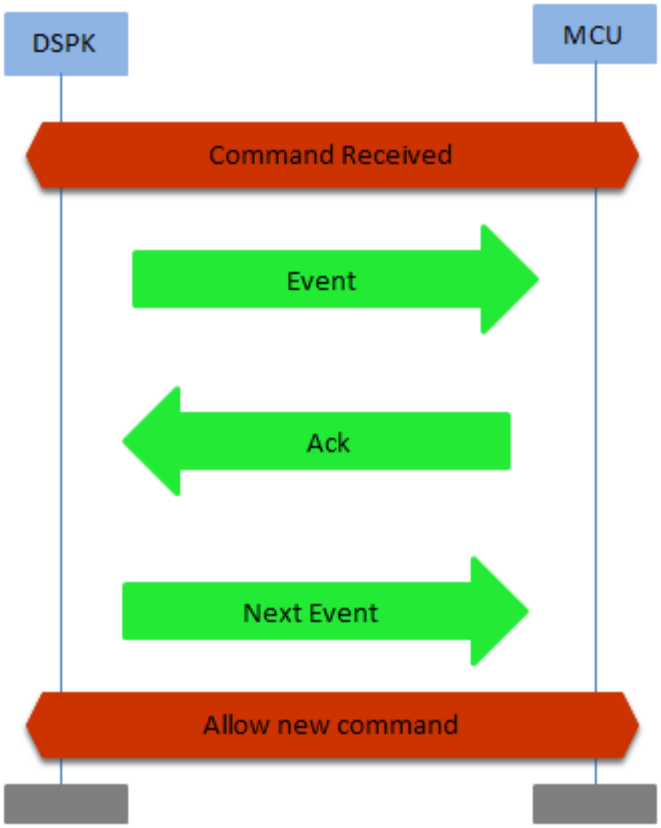


Fig 2.5.2:After sending the command,MCU did not receive the ACK within 200ms,So MCU resending the same command

If the precondition is not met for any of the commands, then, the DSPK will send Command_ACK Event packet with status = “command disallow”. Deviation from this behavior, if any, will be mentioned in the individual command description.

1.5.2 Event Packet Handling

After sending Event from DSPK to MCU.DSPK will wait for 800 ms timeout period. If ACK is received from MCU within this time or timeout happened then the next event will be sent.



1.5.3 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.

3 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_BTM_Version	Read_BTM_Version_Reply	V2.00	
0x09	Get_PB_By_AT_Cmd			
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	Set_Access_PB_Method			
0x12	Send_SPP/iAP_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_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	MAP_REQUEST			
0x22	Security_Bonding_Req		V2.00	V2.01
0x23	Set_Overall_Gain		V2.00	
0x24	Read_BTM_Setting	REPORT_TYPE_BTM_SETTING	V2.00	
0x25	Read_BTM_Batt_CHG_Status	BTM_Battery_Status BTM_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	nSPK Vendor Cmd		V2.00	
0x2B	Read_NSPK_Link_Status	Report_nSPK_Link_Status	V2.00	
0x2C	NSPK_Sync_Audio_Effect		V2.00	
0x2D	LE_GATT_CMD		V2.00	
0x2F	LE_App_CMD		V2.00	
0x30	DSP_RUNTIME_PROGRAM		V2.00	
0x31	Read_Vendor_EEPROM_Data	Report_Vendor_EEPROM_Data	V2.00	
0x32	Query IC version information	Report_IC_Ver_Info	V2.00	
0x33	Voice_Prompt_Ind_Cmd		V2.00	
0x34	Read_BTM_Link_Mode	Report_BTM_Link_Mode	V2.00	
0x35	Configure_Vendor_Parameter		V2.00	
0x36	DSP_Dedicated_Cmd	DSP_Dedicated_Event	V2.00	
0x37	nSPK Exchange_Link_Info_Cmd		V2.00	
0x38	UART_CMD_NSPK_SET_GIAC		V2.00	
0x39	READ_FEATURE_LIST	Report_Read_Feature_List_Reply	V2.00	
0x3A	Personal_MSPK_GROUP_Control		V2.00	
0x3B	UART_CMD_TEST_DEVICE		V2.00	
0x40	Reserved for internal test		V2.01	

UART Event

UART Event		Support version	
OP code	Event	Start	End
0x00	Command_ACK	V2.00	
0x01	BTM_Status	V2.00	
0x02	Call_Status	V2.00	
0x03	Caller_ID	V2.00	
0x04	SMS_Received_Indication	V2.00	
0x05	Missed_Call_Indication	V2.00	
0x06	Phone_Max_Battery_Level	V2.00	
0x07	Phone_Current_Battery_Level	V2.00	
0x08	Roaming_Status	V2.00	
0x09	Phone_Max_Signal_Strength_Level	V2.00	
0x0A	Phone_Current_Signal_Strength_Level	V2.00	
0x0B	Phone_Service_Status	V2.00	
0x0C	BTM_Battery_Status	V2.00	
0x0D	BTM_Charging_Status	V2.00	
0x0E	Reset_To_Default	V2.00	
0x0F	Report_HF_Gain_Level	V2.00	
0x10	EQ_Mode_Indication	V2.00	
0x11	PBAP_Missed_Call_History		
0x12	PBAP_Received_Call_History		
0x13	PBAP_Dialed_Call_History		
0x14	PBAP_Combine_Call_History		
0x15	Phonebook_Contacts		
0x16	PBAP_Access_Finish		
0x17	Read_Linked_Device_Information_Reply	V2.00	
0x18	Read_BTM_Version_Reply	V2.00	
0x19	Call_List_Report	V2.00	
0x1A	AVC_Specific_Rsp	V2.00	
0x1B	BTM_Utility_Req	V2.00	
0x1C	Vendor_AT_Cmd_Reply	V2.00	
0x1D	Report_Vendor_AT_Event	V2.00	
0x1E	Read_Link_Status_Reply	V2.00	
0x1F	Read_Paired_Device_Record_Reply	V2.00	
0x20	Read_Local_BD_Address_Reply	V2.00	
0x21	Read_Local_Device_Name_Reply	V2.00	
0x22	Report_SPP/iAP_Data	V2.00	
0x23	Report_Link_Back_Status	V2.00	
0x24	REPORT_RING_TONE_STATUS	V2.00	
0x25	User_Confrim_SSP_Req	V2.00	
0x26	Report_AVRCP_Vol_Ctrl	V2.00	
0x27	Report_Input_Signal_Level	V2.00	
0x28	Report_iAP_Info	V2.00	
0x29	REPORT_AVRCP_ABS_VOL_CTRL	V2.00	
0x2A	Report_Voice_Prompt_Status	V2.00	
0x2B	Report_MAP_Data		
0x2C	Security_Bonding_Res	V2.00	
0x2D	Report_Type_Codec	V2.00	
0x2E	Report_Type_BTM_Setting	V2.00	
0x2F	Report_MCU_Update_Reply	V2.00	
0x30	Report_BTM_Initial_Status	V2.00	
0x31	LE_ANCS_Service_Event	V2.00	
0x32	LE_Signaling_Event	V2.00	
0x33	Report_nSPK_Link_Status	V2.00	
0x34	Report_nSPK_Vendor_Event	V2.00	
0x35	Report_nSPK_Audio_Setting	V2.00	
0x36	Report_Sound_Effect_Status	V2.00	
0x37	Report_Vendor_EEPROM_Data	V2.00	
0x38	REPORT_IC_VERSION_INFO	V2.00	

0x39	REPORT_LE_GATT_EVENT	V2.00
0x3A	Report_BTM_Link_Mode	V2.00
0x3B	DSP_Dedicated_Event	V2.00
0x3C	Report_nSPK_MISC_Event	V2.00
0x3D	Report_nSPK_Exchange_Link_Info	V2.00
0x3E	Report Customized_Information	V2.00
0x3F	Report_CSB_CLK	V2.00
0x40	Report_Read_Feature_List_Reply	V2.00
0x41	REPORT_TEST_RESULT_REPLY	V2.00
0x50	Reserved for internal use	V2.01

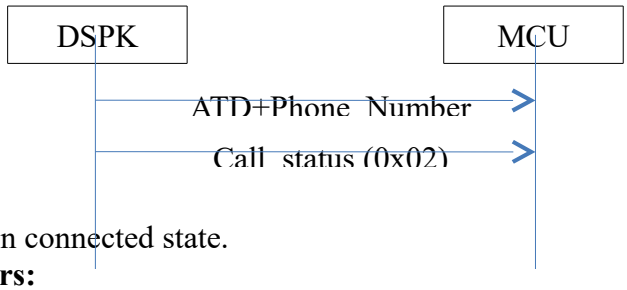
1.6 UART Commands

1.6.1 Make_Call (0x00)

Command	Op Code	Command Parameters	Return Event
Make_Call	0x00	Data_Base_Index, Phone_Number	Call_Status

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

[Return to Command Table]

1.6.2 Make_Extension_Call (0x01)

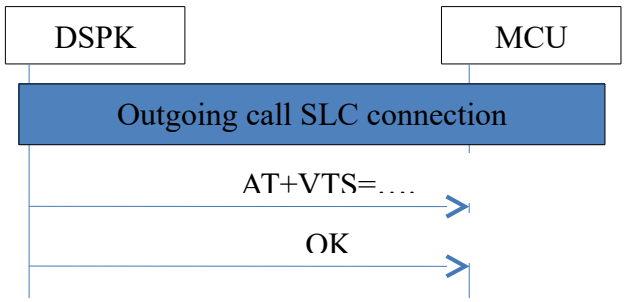
Command	Op Code	Command Parameters	Return Event
Make_Extension_Call	0x01	Data_Base_Index, Extension_Number	

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:

2. An ongoing Service Level Connection between the AG and the HF shall exist.
3. 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]

1.6.3 Event_Filter_Setting (0x03)

Command	Op Code	Command Parameters	Return Event
Event_Filter_Setting	0x03	Event_Filter	

Description:

This command is used to control which events are to be filtered for the Host MCU. If the bit in the Event_Filter_Setting is set to one, then the event associated with that bit will not be reported. The Host MCU has to deal with each event that is generated by BTM. The event filter setting allows the Host MCU to control which events will interrupt it. The default values of Event_Filter Bit are all zero.

Precondition:

None.

Command Parameters:

Event_Filter: *Length: 4 Bytes*

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

Event_Filter_Table: *Length: 4 Bytes*

Byte 0	Parameter Description
Bit 0	Reserved
Bit 1	Reserved
Bit 2	Call Status
Bit 3	Incoming Call Number or Caller ID
Bit 4	SMS Received
Bit 5	Missed Call
Bit 6	Max Cell Phone Battery Level
Bit 7	Current Cell Phone Battery Level

Byte 1	Parameter Description
Bit 0	Cell Phone Roaming
Bit 1	Max Cell Phone Signal Strength
Bit 2	Current Cell Phone Signal Strength
Bit 3	Cell Phone Service Status
Bit 4	BTM Battery Level
Bit 5	BTM Charging Status
Bit 6	BTM Reset To Default Settings OK
Bit 7	BTM DAC Gain Level

Byte 2	Parameter Description
Bit 0	EQ Mode
Bit 1	Remote Device Friendly Name
Bit 2	AVC Vendor Specific Response
Bit 3	Unknown AT Command Result Code
Bit 4	Page Status
Bit 5	Ringtone Status
Bit 6	Reserved
Bit 7	Reserved

Byte 3	Parameter Description
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]

1.6.4 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
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]

1.6.5 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.

Note: This command does not update the device name in the E2PROM.So new name set by this command will not be effective after the power cycle.

Precondition:

None.

Command Parameters:

BT_Device_Name: *Length: 32 Bytes*

Value	Parameter Description
0xXXXX	Bluetooth device name

[Return to Command Table]

1.6.6 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.

Precondition:

None.

Command Parameters:

PIN Code: *Length: 4 Octets*

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

[Return to Command Table]

1.6.7 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:

Parameter: *Length: 1 Byte*

Value	Parameter Description
0x00	To Set Pairing Timeout Value
0x01	To Set Supported Codec Type(This change will update the e2prom)
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 Profile
0x05	Set SBC bitpool setting : this should be set before A2DP connection established
0x06	Setting iAP2 serial number (This change will update the e2prom)
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 Mask:
Bit 1	should be set to1 for Enabling AAC
Bit 2	should be set to 1 for Enabling Vendor Specific Codec
	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
Bit 4	AVRCP TG
Bit 5	SPP
Bit 6	iAP
Bit 7	Reserved

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]

1.6.8 Read_BTM_Version (0x08)

Command	Op Code	Command Parameters	Return Event
Read_BTM_Version	0x08	Type	Read_BTM_Version_Reply

Description:

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

Precondition:

None.

Command Parameters:

Type: *Length: 1 Byte*

Value	Parameter Description
0x00	To Query Supported UART Command Set Version
0x01	To Query BTM FW Version

[Return to Command Table]

1.6.9 Vendor_AT_Cmd (0x0A)

Command	Op Code	Command Parameters	Return Event
Vendor_AT_Cmd	0x0A	Data_Base_Index,Cmd_Payload	Report_Vendor_AT_Event

Description:

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

Precondition:

HF should be in connected state and there should not be any vendor specific AT command already in progress.

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
0xXXXX..	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

[Return to Command Table]

1.6.10 AVC_Vendor_Dependent_Cmd (0x0B)

Command	Op Code	Command Parameters	Return Event
AVC_Vendor_Dependent_Cmd	0x0B	Data_Base_Index, Avc_Cmd_Payload	AVC_Vendor_Dependent_Response

Description:

This command is used to send vendor dependent AVC type commands. Only single packet type is supported for this command. Refer the Avc_Cmd_Payload table given below for the supported PDU IDs. Detail setting needs to refer to AVRCP Specification [4]

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

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No AVRCP connection

[Return to Command Table]

1.6.11 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]

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

[Return to Command Table]

1.6.12 Read_Link_Status (0x0D)

Command	Op Code	Command Parameters	Return Event
Read_Link_Status	0x0D	Reserved	Read_Link_Status_Reply

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]

1.6.13 Read_Paired_Device_Record (0x0E)

Command	Op Code	Command Parameters	Return Event
Read_Paired_Device_Record	0x0E	Reserved	Read_Paired_Device_Record_Reply

Description:

This command is used to read the paired device information from BTM. The information will have link priority (1 is the highest (newest device) and 4 is the lowest (oldest device)) and BD address of the paired devices.

Precondition:

None.

Command Parameters:

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to Command Table]

1.6.14 Read_Local_BD_Address (0x0F)

Command	Op Code	Command Parameters	Return Event
Read_Local_BD_Address	0x0F	Reserved	Read_Local_BD_Address_Reply

Description:

This command is used to read the local BD address.

Precondition:

None.

Command Parameters:

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to Command Table]

1.6.15 Read_Local_Device_Name (0x10)

Command	Op Code	Command Parameters	Return Event
Read_Local_Device_Name	0x10	Reserved	Read_Local_Device_Name_Reply

Description:

This command is used to read the local device name.

Precondition:

None.

Command Parameters:

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to Command Table]

1.6.16 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 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

Total_Length: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	Total Payload Length

Payload_Length: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	Payload Length In This Packet

Payload: *Length: N Bytes*

Value	Parameter Description
0xXXXX	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

[Return to Command Table]

1.6.17 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.

Precondition:

None.

Command Parameters:

Utility_Function_Type: *Length: 1 Byte*

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 the specific tone
0x03	To make BTM inactive 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 NSPK, MCU notifies the BTM current power condition
0x09	To update vendor EEPROM data
0x0A	For NSPK, To inform Master that certain status has been changed in Slave 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

★ Customize commands default are disable. Please check the firmware release note to identify which customize commands support.

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.

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
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

Parameter for Utility_Function_Type 0x04: *Length: 1 Byte*

Value	Parameter Description
0x00	Adaptor plugged in
Others	Adaptor unplugged

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

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

Return error: *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Parameter incorrect

[Return to Command Table]

1.6.18 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:

Event_ID *Length: 1 Byte*

Value	Parameter Description
0xXX	Event ID of the event which needs to be acknowledged

[Return to Command Table]

1.6.19 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 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:

Data_Base_Index: *Length: 1 Byte*

Value	Parameter Description
0x00	database Index 0 that linked profile occupied
0x01	database Index 1 that linked profile occupied

Linked_Profile: *Length: 1 Byte*

Value	Parameter Description
0x00	To Initiate HF/HS Profile connection
0x01	To Initiate A2DP Profile connection
0x02	To Initiate iAp/SPP Profile connection

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	No ACL link or no any A2DP/AVRCP/HFP/HSP profile connected

[Return to Command Table]

1.6.20 Read_Linked_Device_Information (0x16)

Command	Op Code	Command Parameters	Return Event
Read_Linked_Device_Information	0x16	Data_Base_Index, Type	Read_Linked_Device_Information_Reply

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

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 Device Name
0x01	Query 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	Reserved

Return error: *Length: 1 Byte*

Value	Description	Condition
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]

1.6.21 Profile_Link_Back (0x17)

Command	Op Code	Command Parameters	Return Event
Profile_Link_Back	0x17	Type, Device_Index, Profile, BT_Addr	Report_Link_Back_Status

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 : if last device supports HF/HS, then initiate HF/HS connection, otherwise initiate A2DP connection	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	initiate connection to multipoint mode	NA

Device_Index: *Length: 1 Byte*

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

Profile: *Length: 1 Byte*

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
0xXXXXXXXXXXXX	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	nSPK is creating connection TYPE=0x01: The last device doesn't support HF/HS/A2DP Incorrect TYPE

[Return to Command Table]

1.6.22 Disconnect (0x18)

Command	Op Code	Command Parameters	Return Event
Disconnect	0x18	Disconnection_Flag	BTM_Status

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: *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/BLE (if BLE enable) connections
Bit 4	Disconnect all of the SPP 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]

1.6.23 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".

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

[Return to Command Table]

1.6.24 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]

1.6.25 EQ_Mode_Setting (0x1C)

Command	Op Code	Command Parameters	Return Event
EQ_Mode_Setting	0x1C	EQ_Mode, Reserved	EQ_Mode_Indication

Description:

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

Precondition:

EQ Mode should be enabled by using DSP configuration tool.

Command Parameters:

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
0xXX	Reserved

Return error: *Length: 1 Byte*

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

[Return to Command Table]

1.6.26 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
0x1C	DISABLE_SPK_NR
Others	Reserved

Return error: *Length: 1 Byte*

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

[Return to Command Table]

1.6.27 GPIO_CTRL (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,	Report_Input_Signal_Level

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.

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. 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 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]

1.6.28 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.

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]

1.6.29 Voice_Prompt_Cmd (0x20)

Command	Op Code	Command Parameters	Return Event
Voice_Prompt_Cmd	0x20	Cmd_Type, Parameter,	Report_Voice_Prompt_Status

Voice_Data

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
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
0xXXXX	Invalid

Voice_Data: for Cmd_Type 0x01 *Length: N Bytes*

Value	Parameter Description
0xXXXX	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

1.6.30 Set_Overall_Gain (0x23)

Command	Op Code	Command Parameters	Return Event

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

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 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 Other types are reserved

Gain 2: Effective when bit1 of mask is 1 or type is 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 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]

1.6.31 Read_BTM_Setting (0x24)

Command	Op Code	Command Parameters	Return Event
Read_BTM_Setting	0x24	Setting_Type, Reserved	REPORT_TYPE_BTM_SETTING

Description:

This command is used to read setting status of BTM.

Precondition:

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
0xXX	Reserved

Return error: *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect parameter

[Return to Command Table]

1.6.32 Read_BTM_Battery_Charger_Status (0x25)

Command	Op Code	Command Parameters	Return Event
Read_BTM_Battery_Charger_Status	0x25	Type	BTM_Battery_Status BTM_Charging_Status

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
0x03	Parameter error	Parameter incorrect.

[Return to Command Table]

1.6.33 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

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]

1.6.34 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 capacity (unit in percentage)

Precondition:

None.

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]

1.6.35 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.

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

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
	The format of a GetNotification Attribute command. [2]

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]

1.6.36 LE_Signaling_Cmd (0x29)

Command	Op Code	Command Parameters	Return Event
LE_Signaling_Cmd	0x29	SubCommand_Type, SubCommand_Payload	LE_Signaling_Event 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
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
0xXXXX(2 Bytes)	Connection Interval Minimum: 0x0006 to 0x0C80 (7.5ms ~ 4s), Minimum value for the connection event interval.
0xXXXX(2 Bytes)	Connection Interval Maximum: 0x0006 to 0x0C80 (7.5ms ~ 4s), Maximum value for the connection event interval.
0xXXXX(2 Byte)	Slave Latency: Range: 0 to ((Supervision Timeout / (Connection Interval x2)) -1) and shall also be less than 500, The Slave Latency parameter defines the number of consecutive connection events that the slave device is not required to listen for the master.
0xXXXX(2 Bytes)	Supervision : 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).

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]

1.6.37 nSPK_Vendor_Cmd (0x2A)

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

Description:

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

SPK2

SPK1

Precondition:

None.

Command Parameters:

SPK_Index : *Length: 1 Byte*

Value	Parameter Description
0x00	the slave SPK(SPK2/3) send vendor command to master SPK
0x01	master SPK(SPK1) send vendor command to the slave SPK(SPK2)

Parameter: SPK_Index :0x00 *Length: N Bytes*

SPK_Index	Parameter Content	Parameter Description
0x00	Invalid payload data	they are used to show the status of slave SPK
0x01~0x1F	Valid payload data. This data will be transfer to SPK Master and SPK Master's MCU by E34	
0x20~0xFF	Invalid payload data.	

Parameter: SPK_Index :0x01

SPK_Index	Parameter Content	Parameter Description
Byte[0]	High bytes of following data length	they are used to show the status of slave SPK
Byte[1]	Low bytes 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]

1.6.38 Read_nSPK_Link_Status (0x2B)

Command	Op Code	Command Parameters	Return Event
Read_NSPK_Link_Status	0x2B	Reserved	Report_nSPK_Link_Status

Description:

This command is used to query the nSPK link status.

Precondition:

None.

Command Parameters:

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to Command Table]

1.6.39 nSPK_Sync_Audio_Effect (0x2C)

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

Description:

It is used for Master SPK to sync audio effect to Slave SPK in nSPK 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]

1.6.40 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:

Precondition:

None.

3.1.1.1 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

1.1.1.1 Send_Write_Response (0x01)

This command is used to manually respond write request to the GATT client. DSPK 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
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

1.1.1.2 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:

Characteristic_Value_Handle: *Length: 2 Byte*

Value	Parameter Description
0xXX	characteristic value handle

Characteristic_Value: *Length: 1 Byte*

Value	Parameter Description
0xXX	characteristic value

1.1.1.3 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

1.1.1.4 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.

1.1.1.5 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 Read_Local_All_Char_Descriptors_Res

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

1.6.41 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.

Precondition:

For Sub_Cmd_Type 0x5D: LE state should be connected.

For Sub_Cmd_Type 0x5C: None

1.1.1.6 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
0xXX	Length of the LE device name

Name_String: *Length: 1 to 20 Bytes*

Value	Parameter Description
0xXX..	LE Device Name String

1.1.1.7 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]

1.6.42 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 Bytes*

Value	Parameter Description

0xXX	Audio EQ Parameter
	//SOFT
	00000000c039631500000000c051eb85400000007fffffff18b42aef45232a270000000
	000000000000000000000000000000000000000000000000000000000000000000
	0000000000000000000000276e41b8
	//BASS
	36b0f0758a53021235a323fc8b5e7fa738b3d27e875cb8cf3a61d55085aef0ef3ed118
	63812f30873f623e57809E0ae70000000000000000000000000000000000000000000
	0000000000000000000000409a1c9f
	//ROCK
	2d35264093ba07232a70b4a7967869291997fe35b268d8f01ae7c4a9b1460ebb3916
	b5b986f9e32239a05624867055943eb27d61814dcb773f5672b280a9d684e648e12c
	13247096fada28801d6d1440623817ec

Cmd Buffer: for Type 0x2D *Length: 7 Bytes*

Value	Parameter Description
0xXX	Sound Effect Parameter //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]

1.6.43 Read_Vendor_Eeprom_Data (0x31)

Command	Op Code	Command Parameters	Return Event
Read_Vendor_Eeprom_Data	0x31	Offset ,Length	Report_Vendor_EEPROM_Data

Description:
This command is used to read the vendor EEPROM data.

Precondition:

None.

Command Parameters:

Offset: *Length: 1 Byte*

Value	Parameter Description
0xXX	Vendor EEPROM 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]

1.6.44 Read_IC_Version_Info (0x32)

Command	Op Code	Command Parameters	Return Event
Read_IC_Version_Info	0x32	Reserved	Report_IC_Ver_Info

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]

1.6.45 Voice_Prompt_Ind_Cmd (0x33)

Command	Op Code	Command Parameters	Return Event
Voice_Prompt_Ind_Cmd	0x33	SubCommand Type, SubCommand Payload	

Description:

This command is used to select voice prompt language (English/ Japanese/ Chinese) and predefined voice prompt source.

Precondition:

None.

Command Parameters:

SubCommand Type: *Length: 1 Byte*

Value	Parameter Description
0x00	voice prompt language selection
0x01	voice prompt source selection

SubCommand_Payload : for SubCommand 0x00 *Length: 1 Byte*

Value	Parameter Description
0x00	English
0x01	Japanese
0x02	Chinese

SubCommand_Payload : for SubCommand 0x01 *Length: 1 Byte*

Value	Parameter Description
0x00	fully charge
0x01	battery about 75%
0x02	battery about 50%
0x03	battery about 20%
0x04	please charge
0x05	left
0x06	right
0x07	connected
0x08	pairing mode

Return error: *Length: 1 Byte*

Value	Description	Condition
0x03	Parameter error	Incorrect sub command parameter

[Return to Command Table]

1.6.46 Read_BTM_Link_Mode (0x34)

Command	Op Code	Command Parameters	Return Event
Read_BTM_Link_Mode	0x34	Reserved	Report_BTM_Link_Mode

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:

None.

Command Parameters:

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to Command Table]

1.6.47 Configure_Vendor_Parameter (0x35)

Command	Op Code	Command Parameters	Return Event
Configure_Vendor_Parameter	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	**Change Device Name:** The device name in EEPROM will be replaced by new device name 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: 1 Byte*

Value	Parameter Description
0xXX	New device name parameter

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	Length is zero or bigger than 64 when use Restore Device Name
0x03	Parameter error	Length is bigger than 23 when use Change Device Name OpCode incorrect

[Return to Command Table]

1.6.48 nSPK Exchange_Link_Info_Cmd (0x37)

Command	Op Code	Command Parameters	Return Event
nSPK 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.

Precondition:

None.

Command Parameters:

Exchange_data: *Length: 16 Byte*

Value	Parameter Description
0xXXXX…	16 bytes exchanged data.

[Return to Command Table]

1.1.51 nSPK Set GIAC(0x38)

Command	Op Code	Command Parameters	Return Event
nSPK 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]

1.1.52 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]

1.1.53 Personal_MSPK_GROUP_Control (0x3A)

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

Description:

This command is used to inform Slave_SPK for Personal MSPK Group Setting enable or disable.

The Master_SPK_BD_ADDR is Master_SPK BT Device Address. Slave_SPK will only accept the MSPK connection for specific Master_SPK if Personal MSPK Group is enabled.

This command must be assert before MSPK Command triggered.

Precondition:

None.

Command Parameters:

Enable: *Length: 1 Byte*

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

Master_SPK_BD_ADDR: *Length: 6 Byte*

Value	Parameter Description
0xXXXXXXXXXXXX	The BT Device Address of Master_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]

1.1.54 UART_CMD_TEST_DEVICE (0x3B)

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

Description:

This command is used to test the assigned device.

Precondition:

None.

Command Parameters:

Test OP code: *Length: 1 Byte*

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

[Return to Command Table]

4 MMI_ACTION UART COMMAND (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
0x01	add/remove SCO link		V2.00
0x02	force end active call		
0x04	Accept an incoming call		V2.00
0x05	Reject an incoming call		V2.00
0x06	End call/ transfer audio to phone		V2.00
0x07	Toggle microphone on/off		V2.00
0x08	Mute microphone		V2.00
0x09	Active microphone		V2.00
0x0A	voice dial		V2.00
0x0B	cancel voice dial		V2.00
0x0C	last number redial		V2.00
0x0D	Set the active call on hold and active the hold call		V2.00

0x0E	switch voice between phone and headset	V2.00
0x0F	Query call list information(CLCC)	V2.00
0x10	three way call	V2.00
0x11	release the waiting call or on hold call	V2.00
0x12	accept the waiting call or active the on hold call and release the active call	V2.00
0x16	initiate HF connection	
0x17	disconnect HF link	V2.00
0x18	Enable RX noise reduction when SCO ready	
0x19	Disable RX noise reduction when SCO ready	
0x1A	Switch RX noise reduction when SCO ready	
0x1B	Enable TX noise reduction when SCO ready	
0x1C	Disable TX noise reduction when SCO ready	
0x1D	Switch TX noise reduction when SCO ready	
0x1E	Enable AEC when SCO ready	V2.00
0x1F	Disable AEC when SCO ready	V2.00
0x20	Switch AEC enable/disable when SCO ready	V2.00
0x21	Enable AEC RX noise reduction when SCO ready	V2.00
0x22	Disable AEC RX noise reduction when SCO ready	V2.00
0x23	Switch AEC RX noise reduction when SCO ready	V2.00
0x24	increase microphone gain	V2.00
0x25	decrease microphone gain	V2.00
0x26	switch primary HF device and secondary HF device role	V2.00
0x30	increase speaker gain	
0x31	decrease speaker gain	
0x32	Play/Pause music	
0x33	Stop music	
0x34	Next song	
0x35	Previous song	
0x36	Fast forward	
0x37	Rewind	
0x38	EQ mode up	
0x39	EQ mode down	
0x3A	Lock button	V2.00
0x3B	Disconnect A2DP link	V2.00
0x3C	next audio effect	V2.00
0x3D	previous audio effect	V2.00
0x3E	Toggle 3D effect	
0x3F	report current EQ mode	V2.00
0x40	report current audio effect status	V2.00
0x50	enter pairing mode (from power off state)	

0x51	power on button press	V2.00
0x52	power on button release	V2.00
0x53	power off button press	V2.00
0x54	power off button release	V2.00
0x55	Reverse panel	V2.00
0x56	Reset some EEPROM setting to default setting	V2.00
0x57	Force speaker gain toggle	V2.00
0x58	Toggle button indication	V2.00
0x59	Combine function 0	V2.00
0x5A	Combine function 1	V2.00
0x5B	Combine function 2	V2.00
0x5C	Combine function 3	V2.00
0x5D	fast enter pairing mode (from non-off mode)	V2.00
0x5E	Switch power OFF	V2.00
0x5F	Disable LED	V2.00
0x60	Toggle buzzer	V2.00
0x61	Disable buzzer	V2.00
0x62	Enable buzzer	V2.00
0x63	Change tone set (SPK module support two sets of tone)	V2.00
0x64	Retrieve phonebook	
0x65	Retrieve MCH	
0x66	Retrieve ICH	
0x67	Retrieve OCH	
0x68	Retrieve CCH	
0x69	Cancel access PBAP	
0x6A	Indicate battery status	V2.00
0x6B	Exit pairing mode	V2.00
0x6C	link last device	
0x6D	disconnect all link	
0x6E	OHS event 1	
0x6F	OHS event 2	
0x70	OHS event 3	
0x71	OHS event 4	
0x72	SHS_SEND_USER_DATA_1 (for embedded application mode)	V2.00
0x73	SHS_SEND_USER_DATA_2 (for embedded application mode)	V2.00
0x74	SHS_SEND_USER_DATA_3 (for embedded application mode)	V2.00
0x75	SHS_SEND_USER_DATA_4 (for embedded application mode)	V2.00
0x76	SHS_SEND_USER_DATA_5 (for embedded application mode)	V2.00
0x77	report current RX NR status	V2.00
0x78	report current TX NR status	V2.00

0x79	force buzzer alarm	
0x7A	Cancel all BT paging	V2.00
0x7B	OHS event 5	
0x7C	OHS event 6	
0x7D	Disconnect SPP link	V2.00
0xC0	OHS event 7 (for Unlimiter project)	
0xC1	OHS event 8 (for Unlimiter project)	
0xC2	OHS event 9 (for Unlimiter project)	
0xC3	OHS event 10 (for Unlimiter project)	
0xC4	OHS event 11 (for Unlimiter project)	
0xC5	OHS event 12 (for Unlimiter project)	
0xC6	OHS event 13 (for Unlimiter project)	
0xC7	OHS event 14 (for Unlimiter project)	
0xC8	OHS event 15 (for Unlimiter project)	
0xC9	OHS event 16 (for Unlimiter project)	
0xCA	OHS event 17 (for Unlimiter project)	
0xCB	Switch DSP mode 2 or 3 (for Unlimiter project)	
0xE0	Trigger NSPK Master	V2.00
0xE1	Trigger NSPK Slave	V2.00
0xE2	NSPK one key connect/disconnect	V2.00
0xE3	Cancel NSPK creation	V2.00
0xE4	Terminate NSPK link	V2.00
0xE5	Terminate / Cancel NSPK connection	V2.00
0xE6	NSPK Master enter Aux-in 44.1K PCM Encoder mode	V2.00
0xE7	NSPK Master enter Aux-in 48K PCM Encoder mode	V2.00
0xE8	NSPK Master exit Aux-in PCM Encoder mode	V2.00
0xE9	NSPK Master enter Aux-in SBC Encoder mode	V2.00
0xEA	NSPK Master exit Aux-in SBC Encoder mode	
0xEB	NSPK dynamic creation	V2.00
0xEC	NSPK switch channel	V2.00
0xED	NSPK power off all speakers	V2.00
0xEE	NSPK AFH SBCENCODING AUDIOSYNC	V2.00
0xF0	NSPK MASTER PAGE SLAVE FOR NEW SLAVE	
0xF1	NSPK SLAVE ENABLE PAGE SCAN FOR NEW MASTER	
0xF2	NSPK SLAVE USE SLOW PAGE SCAN	
0xF3	NSPK SLAVE USE FAST PAGE SCAN	
0xF4	NSPK_ENTER_NSPK_MODE	V2.00
0xF5	NSPK_ENTER_BROADCAST_MODE	V2.00
0xF6	NSPK_ADD_THIRD_SPK	V2.00
0xF7	NSPK_SOUND_SYNCHRONIZATION	V2.00
0xF8	NSPK_CSB_CONNECTED_MODE_SWITCH	V2.00

0xF9	NSPK back to last mode	V2.00

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 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

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]

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
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]

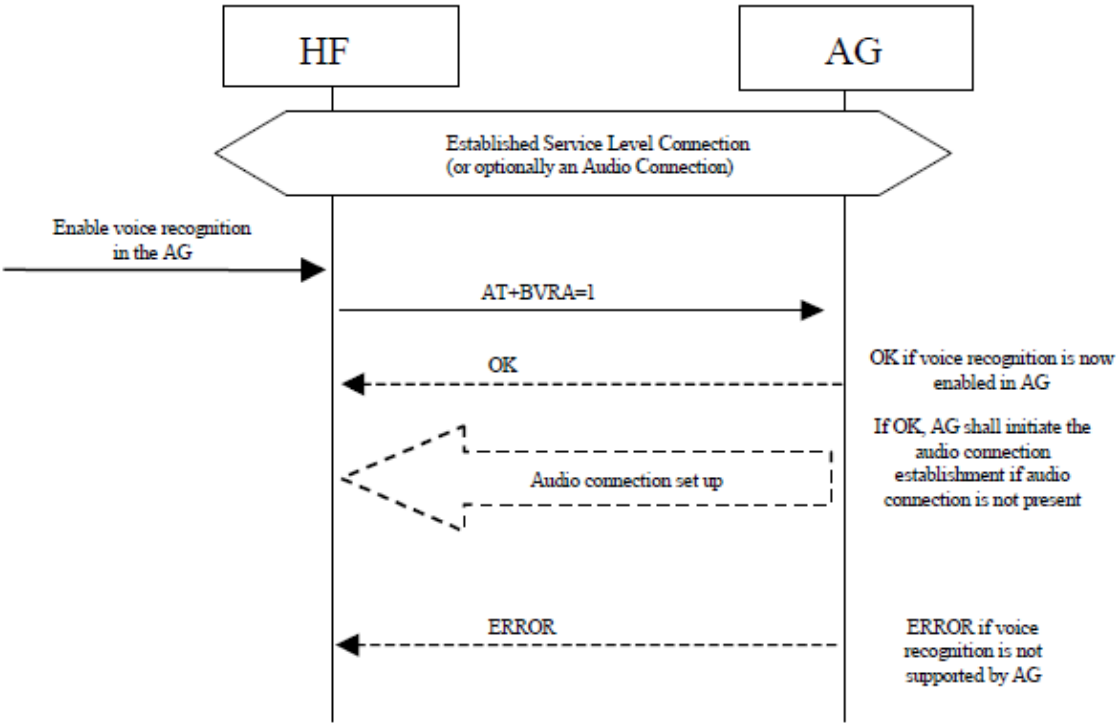
Action 0x0A:

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]

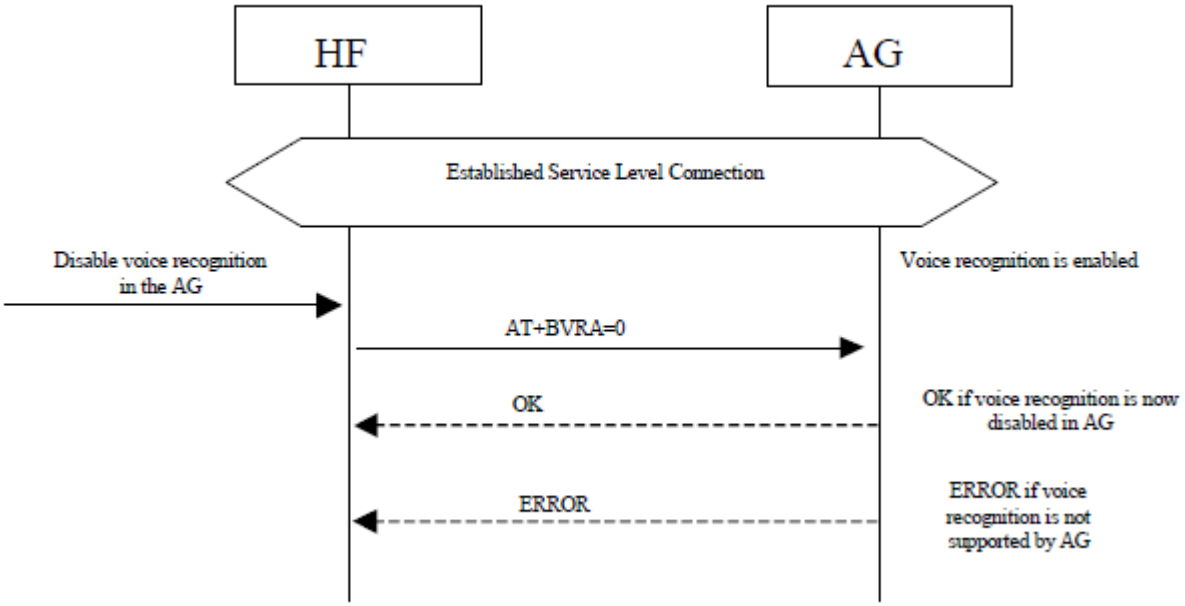
Action 0x0B:

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.

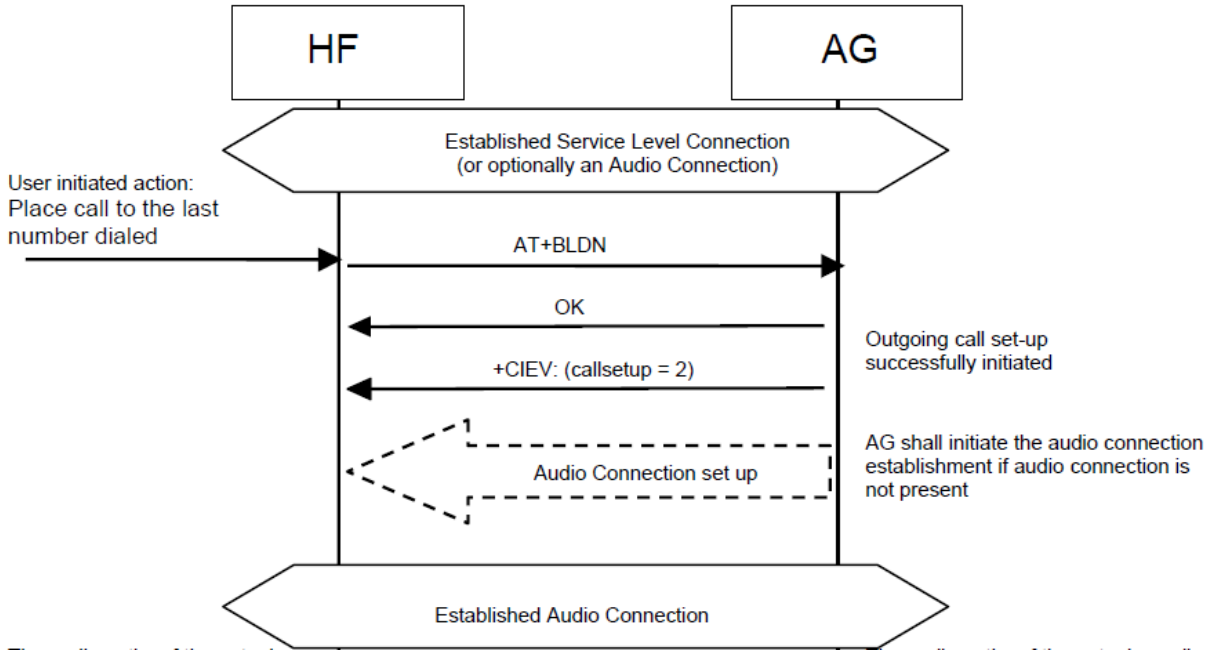


[Return to Action Table]

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.



[Return to Action Table]

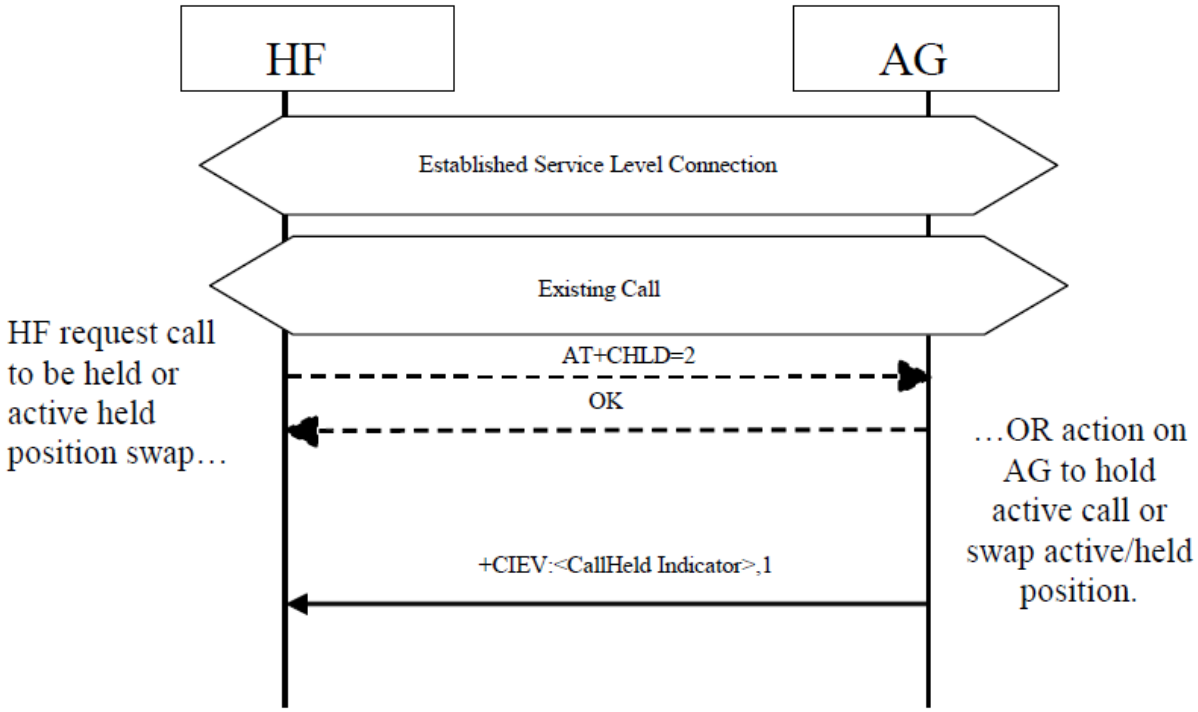
Action 0x0D:

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.



[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:

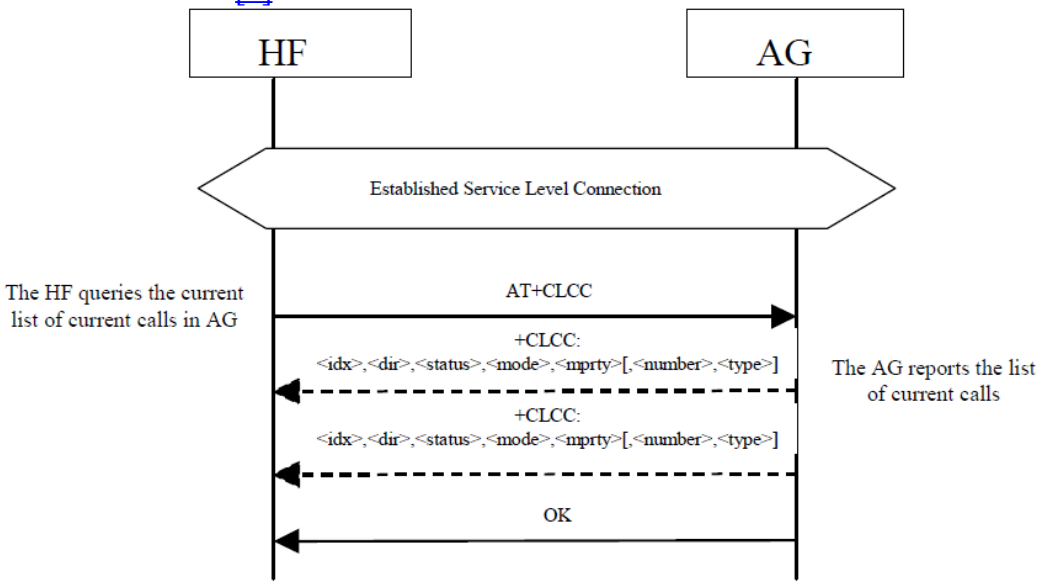
Value	Parameter Description
0x0F	trigger SPK Module to query call list information

Return error: *Length: 1 Byte*

Value	Description	Condition
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

7: Alternating voice/data, data mode

8: Alternating voice/fax, fax mode

9: Unknown

<mpty>

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]

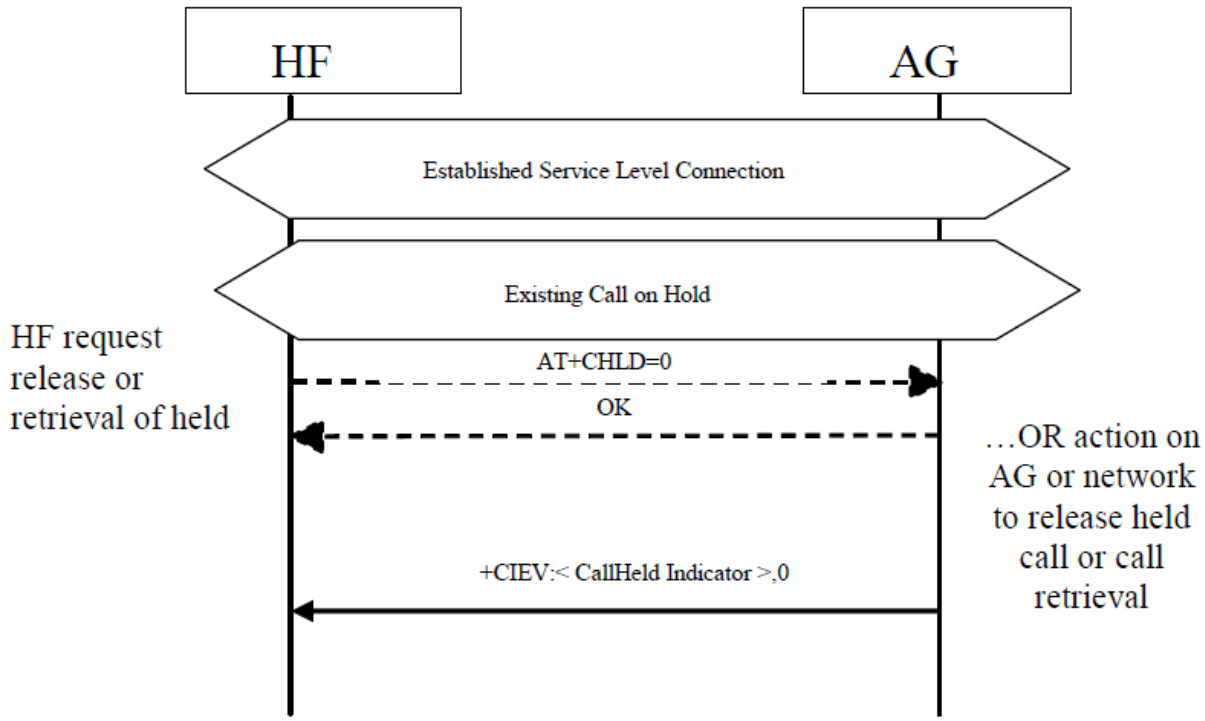
Action 0x11:

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.



[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 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

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:
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]

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

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.
[Return to Action Table]

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.
[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
NSPK_channel	nSPK 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.
[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.
[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*

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 nSPK is connected, this action is used to disconnect the remote nSPK 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.
[Return to Action Table]

Action 0x60:

Value	Parameter Description
0x60	Toggle buzzer

Description:
This action is used to toggle buzzer if Buzzer function implement.
[Return to Action Table]

Action 0x61:

Value	Parameter Description
0x61	Disable buzzer

Description:
This action is used to disable buzzer if Buzzer function implement.
[Return to Action Table]

Action 0x62:

Value	Parameter Description
0x62	Enable buzzer

Description:
This action is used to enable buzzer if Buzzer function implement.
[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.
[Return to Action Table]

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 paring 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)
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.
[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.
[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

Description:
This action is used to report current TX NR status.
[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 0xE0:

Value	Parameter Description
0xE0	Trigger NSPK Master

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 NSPK Master mode.
[Return to Action Table]

Action 0xE1:

Value	Parameter Description
0xE1	Trigger NSPK Slave

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 NSPK Slave mode.
[Return to Action Table]

Action 0xE2:

Value	Parameter Description
0xE2	NSPK 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 3rd SPK"

Description:
This action is used for NSPK one key connect/disconnect.
[Return to Action Table]

Action 0xE3:

Value	Parameter Description
0xE3	Cancel NSPK create connection

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under "Connecting", "Connected" or "Add 3rd SPK"

Description:
This action is used to cancel NSPK create connection.
[Return to Action Table]

Action 0xE4:

Value	Parameter Description
0xE4	Terminate NSPK link

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	CSB state doesn't under "Connected" or "Add 3rd SPK"

Description:
This action is used to terminate NSPK link.
[Return to Action Table]

Action 0xE5:

Value	Parameter Description
0xE5	Terminate / Cancel NSPK 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 3rd SPK"

Description:
This action is used to terminate/cancel NSPK connection.

[Return to Action Table]

Action 0xE6:

Value	Parameter Description
0xE6	NSPK Master enter Aux-in 44.1K PCM Encoder mode

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:
This action is used for NSPK master enter AUX-IN 44.1K PCM encoder mode.
[Return to Action Table]

Action 0xE7:

Value	Parameter Description
0xE7	NSPK Master enter Aux-in 48K PCM Encoder mode

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:
This action is used for NSPK master enter AUX-IN 48K PCM encoder mode.
[Return to Action Table]

Action 0xE8:

Value	Parameter Description
0xE8	NSPK Master exit Aux-in PCM Encoder mode

Description:
This action is used for NSPK master exit AUX-IN PCM encoder mode.
[Return to Action Table]

Action 0xE9:

Value	Parameter Description
0xE9	NSPK Master enter Aux-in SBC Encoder mode

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:
This action is used for NSPK master enter AUX-IN SBC encoder mode.
[Return to Action Table]

Action 0xEB:

Value	Parameter Description
0xEB	NSPK dynamic creation

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	CSB state and Line-in state doesn't under IDLE mode

Description:
This action is used for NSPK dynamic creation.
[Return to Action Table]

Action 0xEC:

Value	Parameter Description
0xEC	NSPK switch channel

Description:
This action is used for NSPK switch channel.
[Return to Action Table]

Action 0xED:

Value	Parameter Description
0xED	nSPK power off all speakers

Description:
This action is used to execute the power off process. If nSPK is connected, this action is used to disconnect the remote nSPK 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	NSPK AFH SBC ENCODING AUDIO SYNC

Description:
This action is used for NSPK AFH SBC encoding audio sync.
[Return to Action Table]

Action 0xF4:

Value	Parameter Description
0xF4	NSPK ENTER NSPK MODE

Description:
This action is used for NSPK enter NSPK mode. It reports nSPK link status and CSB state.
[Return to Action Table]

Action 0xF5:

Value	Parameter Description
0xF5	NSPK ENTER BROADCAST MODE

Description:
This action is used for NSPK enter Broadcast mode. It reports nSPK link status and CSB state.
[Return to Action Table]

Action 0xF6:

Value	Parameter Description
0xF6	NSPK ADD THIRD SPK

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:
This action is used to add third SPK.
[Return to Action Table]

Action 0xF7

Value	Parameter Description
0xF7	NSPK_SOUND_SYNCHRONIZATION

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:
This action is used for NSPK sound re-synchronize
[Return to Action Table]

Action 0xF8

Value	Parameter Description
0xF8	NSPK_CSB_CONNECTED_MODE_SWITCH

Return error: *Length: 1 Byte*

Value	Description	Condition
0x01	Command disallow	SPK is slave role

Description:

This action is used for NSPK to switch connected mode.
[Return to Action Table]

Action 0xF9

Value	Parameter Description
0xF9	NSPK_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 NSPK to switch back to last mode.
[Return to Action Table]

5 EVENTS

1.7 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]

1.8 BTM_Status (0x01)

Event	Event Code	Event Parameters
BTM_Status	0x01	State, Link_Info, Parameter

Description:

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

Link_Info: For State 0x00, 0x01, 0x0F, 0x12, 0x13, 0x14 *Length: 1 Byte*

Value	Parameter Description
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

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 or 1)

Link_Info: For State 0x07 0x08 0x0C 0x15 *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
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: 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
0xXX	Byte 2: UUID length. 2 or 16 bytes UUID
0xXXXXXXXXXX	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: 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

Link_Info: For State 0x11 *Length: 1 Byte*

Value	Parameter Description
0x00	Disconnection
0x01	Link loss

Parameter: For State 0x15 *Length: 1 Byte*

Value	Parameter Description
0x00	HSP is connected
0x01	HFP is connected

[Return to event Table]

1.9 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]

1.10 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
0x01	database 1 for dedicate link

Number: *Length: N Bytes*

Value	Parameter Description
0xXX..	caller Id or phone number

[Return to event Table]

1.11 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]

1.12 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:

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
0xXX	Reserved

[Return to event Table]

1.13 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
0xXX	Max Battery Level

[Return to event Table]

1.14 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.

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]

1.15 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]

1.16 Phone_Max_Signal_Strength_Level (0x09)

Event	Event Code	Event Parameters
Phone_Max_Signal_Strength_Level	0x09	Data_Base_Index, Signal_Level

Description:

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]

1.17 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]

1.18 Phone_Service_Status (0x0B)

Event	Event Code	Event Parameters
Phone_Service_Status	0x0B	Data_Base_Index, Service

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]

1.19 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
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]

1.20 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]

1.21 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
0xXXXX	database 0 for dedicate link

[Return to event Table]

1.22 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]

1.23 EQ_Mode_Indication (0x10)

Event	Event Code	Event Parameters
EQ_Mode_Indication	0x10	EQ_Mode,Reserved

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
0xXX	Reserved

[Return to event Table]

1.24 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

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

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]

1.25 Read_BTM_Version_Reply (0x18)

Event	Event Code	Event Parameters
Read_BTM_Version_Reply	0x18	Type, Version

Description:

This event is used to reply Read_BTM_Version command.

Event Parameters:

Type: *Length: 1 Byte*

Value	Parameter Description
0x00	UART Version
0x01	BTM FW Version

Version: for Type 0x00 *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	1st byte: UART Command Main version 2nd byte: UART Command Sub version for example 00 07 means version 0.07

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

[Return to event Table]

1.26 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

[Return to event Table]

1.27 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]

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

[Return to event Table]

1.28 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.
0x05	[NSPK] BTM notify MCU to sync power off BTM
0x06	[NSPK] BTM notify MCU to sync Volume Control
0x07	[NSPK] BTM notify MCU to sync internal gain
0x08	[NSPK] BTM notify MCU to sync A2DP absolute volume
0x09	[NSPK] BTM notify MCU current channel setting
0x0A	[NSPK] BTM notify MCU synced NSPK power condition
0x0B	[NSPK] BTM notify MCU NSPK command success

0x0C	[NSPK] BTM notify MCU NSPK command fail
0x0D	[NSPK] BTM notify MCU certain NSPK Slave status has been changed
0x0E	Reserved
0x0F	Reserved
0x10	Reserved
0x11	[NSPK] BTM notify MCU to sync Line-in absolute volume
0x12	[NSPK] BTM notify MCU that NSPK connection complete.
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
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*

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	NSPK connect complete

[Return to event Table]

1.29 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
0x00	AG response OK
0x01	AG response ERROR
0x02	No response from AG
Others	Reserved

[Return to event Table]

1.30 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"

[Return to event Table]

1.31 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:

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

[Return to event Table]

1.32 Read_Paired_Device_Record_Reply (0x1F)

Event	Event Code	Event Parameters
Read_Paired_Device_Record_Reply	0x1F	Paired_Device_Number, Paired_Record

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
0xXXXXXXXXXXXXXX	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)

[Return to event Table]

1.33 Read_Local_BD_Address_Reply (0x20)

Event	Event Code	Event Parameters
Read_Local_BD_Address_Reply	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

[Return to event Table]

1.34 Read_Local_Device_Name_Reply (0x21)

Event	Event Code	Event Parameters
Read_Local_Device_Name_Reply	0x21	Name_Length, Device_Name

Description:

This event is used to reply the Read_Local_Device_Name (0X10) command.

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

[Return to event Table]

1.35 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*

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
0xXXXX	total payload length

Payload_Length: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	payload length in this packet

Payload: *Length: N Bytes*

Value	Parameter Description
0xXXXX…	payload

[Return to event Table]

1.36 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
0xXX	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

[Return to event Table]

1.37 Ringtone_Status_Indication (0x24)

Event	Event Code	Event Parameters
Ringtone_Status_Indication	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
0xXX	Please Refer Tone Type

Status: *Length: 1 Byte*

Value	Parameter Description
0x00	Ringtone playback is going to be stopped
0x01	Ringtone playback is going to start

[Return to event Table]

1.38 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 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
0x00000000~0x000F423F	Numeric value to be displayed. Valid values are decimal 000000 – 999999.

[Return to event Table]

1.39 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

[Return to event Table]

1.40 Report_Input_Signal_Level (0x27)

Event	Event Code	Event Parameters
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.

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*

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. ……

[Return to event Table]

1.41 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
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

[Return to event Table]

1.42 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

[Return to event Table]

1.43 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
0xXX	Reserved

[Return to event Table]

1.44 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:

Samping_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

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

[Return to event Table]

1.45 Report_Type_BTM_Settings (0x2E)

Event	Event Code	Event Parameters
Report_Type_BTM_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

Setting_Value: For Setting_Type 0x02 *Length: 1 Byte*

Value	Parameter Description
0x00	BTM Standby mode disable
0x01	BTM Standby mode enable
Others	Reserved

[Return to event Table]

1.46 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).

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

[Return to event Table]

1.47 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*

Value	Parameter Description
0x00	initialization completed
Others	Reserved

Reserved: *Length: 1 Byte*

Value	Parameter Description
0xXX	Reserved

[Return to event Table]

1.48 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
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]

1.49 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
0x00	Command Succeeded
0x01-0x3F	Command Failed. (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 Master Device.*
Payload Format: *Connection Interval, Connection Latency, Supervision Timeout*
Connection Interval: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	Range: 0x0006 to 0x0C80 (7.5ms ~ 4s), value for the connection event interval.

Connection Latency: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	Range: 0x0006 to 0x0C80 (7.5ms ~ 4s), value for this connection.

Supervision Timeout: *Length: 2 Bytes*

Value	Parameter Description
0xXXXX	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]

1.50 Report_nSPK_Link_Status (0x33)

Event	Event Code	Event Parameters
Report_nSPK_Link_Status	0x33	CSB_Connection_State, (Mandatory) CSB_State, (Mandatory) CSB_Group_Number, (Optional) CSB_Address, (Optional)

Description:

This event is used to indicate the state of Enhanced Connectionless Broadcasting used for NSPK link (eCSB –link).

SPK3

SPK2

SPK1

Event Parameters:

CSB_Connection_State: *Length: 1 Byte*

Value	Parameter Description
0x00	The master or slave SPK report eCSB-link is non-exist
0x01	The master SPK1 report SPK1 connect with SPK2
0x02	The master SPK1 report SPK1 connect with SPK3
0x03	The master SPK1 report SPK1 connect with SPK2 and SPK3
0x04	The slave SPK report SPK2 or SPK3 was connected with SPK1
0x05	BTM is Broadcast Master and connect to at least one Broadcast Slave
0x06	BTM is Broadcast Slave and connect to Broadcast Master
0x07	The master SPK report Timeout while add more slave SPK in Broadcast mode.

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 NSPK Master
0x06	Power on back to NSPK Slave
0x07	eCSB change from Master connecting to Slave connecting
0x08	eCSB disconnect by NFC
0x09	eCSB has connected to SPK1 and connecting to SPK2

CSB_Group_Number: *Length: 1 Byte*

Value	Parameter Description
0xXX	The number of connected slave 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]

1.51 Report_nSPK_Vendor_Event (0x34)

Event	Event Code	Event Parameters
Report_nSPK_Vendor_Event	0x34	SPK_index, Payload_length, Payload

Description:
This event is used to report the vendor_event from remote speaker to MCU

SPK2

SPK1

Event Parameters:

SPK_Index: *Length: 1 Byte*

Value	Parameter Description
0x00	the slave SPK(SPK2/3) receive vendor cmd form the master SPK(SPK1)
0xFF	When payload length >9 bytes, BTM always returns 0xFF to MCU
others	the master SPK(SPK1) receive vendor cmd from the slave SPK

Payload_Length: *Length: 2 Byte*

Value	Parameter Description
0xXXXX	Payload Length byte 0:higher byte of length byte 1:lower byte of length

Note: slave speaker only send 1 byte (0x01~0x1F) data to master, the Payload_length is 0x0001

Payload: *Length: N*
Bytes

Value	Parameter Description
0xXXXXXXXXX	Vendor command from Master SPK or Vendor command from Slave SPK (only send 1 byte (0x01~ 0x1F) data)

[Return to event Table]

1.52 Report_nSPK_Audio_Setting (0x35)

Event	Event Code	Event Parameters
Report_nSPK_Audio_Setting	0x35	Audio_Effect_Type, Audio_Effect_Value

Description:
This event is used for Slave SPK to report current synced audio setting while Master SPK uses command 0x2C nSPK_Sync_Audio_Effect.

Event 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 event Table]

1.53 Report_Sound_Effect_Status (0x36)

Event	Event Code	Event Parameters
Report_Sound_Effect_Status	0x36	Sound_Type, Sound_Status

Description:

This event is used to report sound effect status.

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]

1.54 Report_Vendor_EEPROM_Data (0x37)

Event	Event Code	Event Parameters
Report_Vendor_EEPROM_Data	0x37	Parameter

Description:

This event is used to report Vendor EEPROM data.

Event Parameters:

Parameter: *Length: 1 Byte*

Value	Parameter Description
0xXX	Vendor eeprom data

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1.55 Report_IC_Ver_Info (0x38)

Event	Event Code	Event Parameters
Report_IC_Ver_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]

1.56 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.

1.56.1 Client_write_char_value (0x00)

This event is used to inform MCU that GATT Client has written a Characteristic Value to **DSPK**.

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

1.56.2 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.

- 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

1.56.3 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_Services_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
1 Byte	2 Bytes	2 Bytes	(Length -4) Bytes

1.56.4 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
Read	0x02
Write Without Response	0x04
Write	0x08
Notify	0x10
Indicate	0x20
Authenticated Signed Writes	0x40
Extended Properties	0x80

1.56.5 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

1.56.6 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]

1.57 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	NSPK master with CSB_Group_Number parameter
0x03	NSPK slave
0x04	Broadcast Master with CSB_Group_Number parameter
0x05	Broadcast Slave

CSB_Group_Number: *Length: 1 Byte*

Value	Parameter Description
0xXX	The number of connected slave speaker. This parameter is only valid when CSB_State is 0x03.

[Return to event Table]

1.58 DSP_Dedicated_Event (0x3B)

Event	Event Code	Event Parameters
DSP_Dedicated_Event	0x3B	SubEvent Type, SubEvent Payload length, SubEvent Payload

Description:

This event is used to report DSP dedicate data.

Event Parameters:

SubEvent Type: *Length: 1 Byte*

Value	SubEvent Type Description
0x00	Send DSP Metadata to Customer DSP Code. MCU/APP can send data to DSP side with an unfixed data length
0x01	Customer DSP Code Upload DSP Metadata. MCU/APP can get data from DSP side with an unfixed data length
0x02-0xFF	reserved

SubEvent Payload Length: *Length: 1 Byte*

Value	SubEvent Type Description
0~255	SubEvent Payload Length

SubEvent Payload: *Length: N Bytes*

Value	SubEvent Payload Description
0xXX	SubEvent Payload

[Return to event Table]

1.59 Report_nSPK_MISC_Event (0x3C)

Event	Event Code	Event Parameters
Report_nSPK_MISC_Event	0x3C	Type, Parameters

Description:

This event is used to report nSPK MISC Event (can be used by customer to report some special event).

Event Parameters:

Type: *Length: 1 Byte*

Value	Type Description
0x00	nspk 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 Master's BD_ADDR

Number of Group: *Length: 1 Bytes*

Value	SubEvent Payload Description
0-255	Number of Group

[Return to event Table]

1.60 Report_nSPK_Exchange_Link_info (0x3D)

Event	Event Code	Event Parameters
Report_nSPK_Exchange_Link_Info	0x3D	Exchanged_data

Description:
This event is used to report the exchanged data of CSB link creation. It will be reported after CSB link is connected.

Event Parameters:

Exchanged_data: *Length: 16 Bytes*

Value	SubEvent Type Description
0xNNNN	16 bytes exchanged data

[Return to event Table]

1.61 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.

Event Parameters:

Payload_type: *Length: 1 Byte*

Value	SubEvent Type Description
0xNN	used to specified the following payload type

Payload: *Length: N Bytes*

Value	SubEvent Payload Description
0xNN	Payload

[Return to event Table]

1.62 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

1.63 Report_Read_Feature_List_Reply (0x40)

Event	Event Code	Event Parameters
Report_Read_Feature_List_Reply	0x40	Feature0, Feature1, Feature2, Feature3

Description:
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 – 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]

1.64 REPORT_TEST_RESULT_REPLY (0x41)

Event	Event Code	Event Parameters
REPORT_TEST_RESULT_REPLY	0x41	opcode, status

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]

6 REVISION HISTORY

Version	Date	History
1.00	2016/04/28	Preliminary Version. Based on UART_CommandSet_v177
1.01	2016/08/03	Base on UART_CommandSet_v192
1.02	2016/09/02	Base on UART_CommandSet_v193.

Version	Date	History
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 0x13 I2S function Add description for UART event packet format.
2.00	2017/3/14	Add Chapter 2.5.3 error handling in UART command. Add new UART command 0x2D, 0x2F, 0x38, 0x39. Add Line-in Abs_vol (0x11), connection_complete (0x12) in event 0x1B Add VP report mode in event 0x2D Add CSB_Connection_State (0x07) in event 0x33. Add new UART event 0x40. Modify description for UART command 0x07, 0x13, 0x1E, 0x29, 0x30, 0x35 Modify subcommand type 0x5 description for UART command 0x17. Modify description for Event 0x01, 0x18, 0x1A, 0x22, 0x33 Remove return error of MMI action (0x40) Remove UART command 0x22, 0x36 Modify Figure 2.4.1 Update contents table. Modify nSPK_Vendor_Cmd (0x2A). Extend payload length from **9** to **11** bytes. Modify Report_nSPK_Vendor_Event (0x34). BTM returns SPK_index 0xFF when payload length > 9 bytes
2.00	2017/5/4	Add UART command 0x3A
2.00	2017/5/17	Modify UART command 0x2D Modify UART event 0x39
2.00	2017/5/23	Modify UART command 0x12
2.00	2017/5/31	Modify UART command 0x3A
2.00	2017/6/2	Add new UART event 0x3F
2.00	2017/6/9	Modify UART event 0x3F
2.00	2017/6/12	Modify UART event 0x33,0x3A
2.00	2017/6/19	Add UART command 0x3B Add UART event 0x41
2.00	2017/6/29	Remove UART event 0x2C Modify UART command 0x0B Modify UART event 0x23
2.01	2017/6/30	Add UART command 0x40 Event 0x50. Reserve for internal test use.

2.01	2017/7/11	Modify UART command 0x0B
2.01	2017/7/13	Modify UART event 0x33,0x3A

7 REMOVE 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
0xCA	OHS event 17 (for Unlimiter project)	Project related command
0xCB	Switch DSP mode 2 or 3 (for Unlimiter project)	Project related command
0xEA	NSPK Master exit Aux-in SBC Encoder mode	TBD
0xF0	NSPK MASTER PAGE SLAVE FOR NEW SLAVE	TBD
0xF1	NSPK SLAVE ENABLE PAGE SCAN FOR NEW MASTER	TBD
0xF2	NSPK SLAVE USE SLOW PAGE SCAN	TBD
0xF3	NSPK SLAVE USE FAST PAGE SCAN	TBD

8 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

9 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