FSC-BT631D Programming User Guide

Release 2.0.3

Table of contents

Chapter 1

Introduction

1.1 Description

This design guide is suitable for engineers to develop FSC-BT631D Bluetooth modules

1.2 Module Default Settings

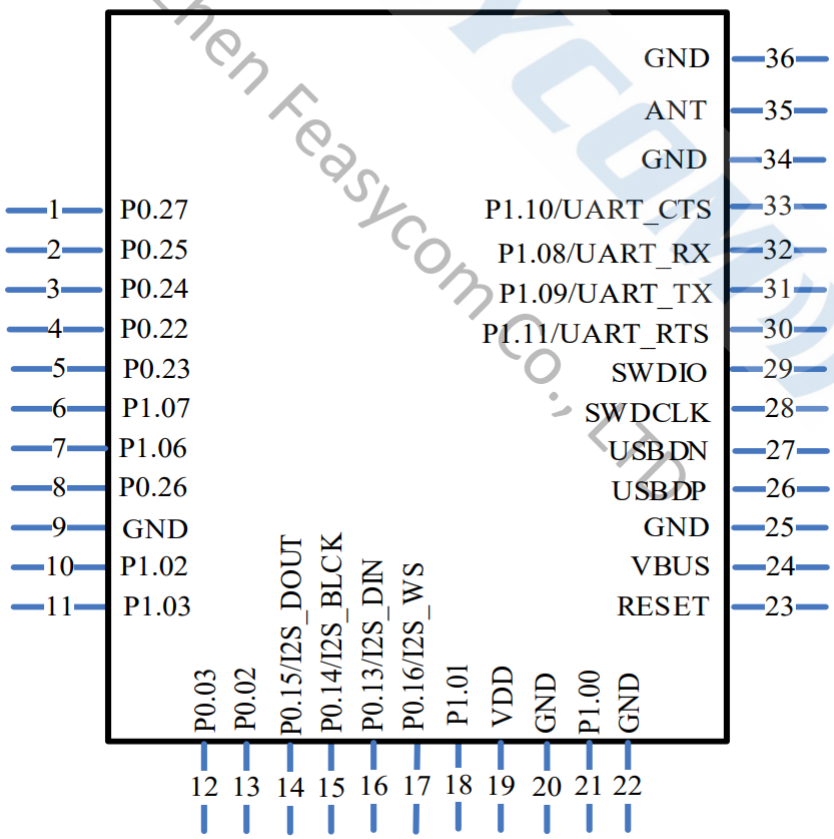
Name	FSC-BT631D-XXXX
LE-Name	FSC-BT631D-LE-XXXX
Pin Code	0000
Secure Simple Pairing Mode	On
UART Baudrate	115200/8/N/1

Chapter 2

Hardware Description

2.1 Pin Diagram

Figure 3-1:Block Diagram



2.2 Pin Description

Pin	Pin Name	Type	Pin Descriptions
14	I2S_OUT	O	I2S DATA OUT
15	I2S_CLK	I/O	I2S BCLK
16	I2S_IN	I	I2S DATA IN
17	I2S_WS	I/O	I2S SYNC
18	I2S_MCLK	I/O	I2S MCLK
21	LED0	I/O	LED0
22	LED1	I/O	LED1
23	RESET	I	External reset input: active Low
24	VBUS	VDD	3.3V power supply, recommended: use LDO power supply
25	GND	GND	GND
26	USB_DP	USB_DP	USB_DP
27	USB_DN	USB_DN	USB_DN
30	UART_RTS	I/O	UART RTS(default: PA mute pin)
31	UART_TX	O	UART TX
32	UART_RX	I	UART RX
33	UART_CTS	I/O	UART CTS(default: No connection required)
35	EXT_ANT	ANT	Change the 0 ohm resistance near the antenna, you can connect an external Bluetooth antenna

2.3 Hardware Design Notes

- The simple test of the module only needs to connect VDD/VDD_IO/VREG_IN/GND/UART_RX/UART_TX to use
- After drawing the schematic diagram, please send it to Feasycom for review,so as to avoid the Bluetooth distance not reaching the best effect

Chapter 3

Function Description

- BT631D is a module that supports both classic Bluetooth and LE Audio. Currently, LE Audio supports BIS function, and more other functions will be developed in the future.
- As the transmitter of BIS, the audio source can be the A2DP of the mobile phone, I2S input (for the development board, it is an analog input, currently only supports the external codec TLV320AIC3204), or USB.

3.1 Profiles & Features

- SPP (Serial Port Profile)
- GATTS (Generic Attribute Profile LE-Peripheral role)
- GATTC (Generic Attribute Profile LE-Central role)
- HFP-HF (Hands-Free Profile)
- HFP-AG (Hands-Free-AG Profile)
- A2DP-Sink (Advanced Audio Distribution Profile)
- A2DP-Source (Advanced Audio Distribution Profile)
- AVRCP-Controller (Audio/Video remote controller Profile)
- AVRCP-Target (Audio/Video remote controller Profile)
- HID-DEVICE (Human Interface Profile)
- PBAP (Phonebook Access Profile)

- BIS (broadcast isochronous stream)
- CIS (Connected Isochronous Stream)

3.2 GATT Default service and characteristic

Type	UUID	Characteristic	Description
Service	0xFFF0		throughput services
Write	0xFFF2	Write， Write Without Response	app send to module
Notify	0xFFF1	Notify	module send to app

Chapter 4

Command Description

4.1 Terms

Throughout this specification:

- {} : Content between { } is optional
- << : Content behind << represents a COMMAND from Host
- >> : Content behind >> represents a RESPONSE/EVENT to Host

4.2 Command Format

AT+Command{=Param1{,Param2{,Param3…}}}<CR><LF>

- All commands start with **"AT"**, end with **<CR><LF>**
- **<CR>** means **"carriage return"**, corresponds to hex value **0x0D**
- **<LF>** means **"line feed"**, corresponds to hex value **0x0A**
- If Command has Parameter, Parameter follows behind **'='**
- If Command has multiple Parameters, Parameter must be separated by **','**
- If Command has Response, Response starts with **<CR><LF>**, ends with **<CR><LF>**
- Module will always report command's execution result by using **"OK"** for success or **"ERROR"** for failure

Error Code	Meaning
001	Failed
002	Invalid parameter
003	Invalid state
004	Command mismatch
005	Busy
006	Command not supported
007	Profile not turned on
008	No memory
Others	Reserved for future use

Example:

Read module’s BR/EDR local name

<< AT+VER

>> +VER=FSC-BT631D-XXXX

>> OK

Pick up an incoming call when no call incoming actually

<< AT+HFPANSW

>> ERR003

4.3 Event Format

<CR><LF>+Indication{=Param1{,Param2{,Param3…}}}<CR><LF>

- All Events start with **<CR><LF>**, end with **<CR><LF>**
- If Event has Parameter, Parameter follow behind ‘=’
- If Event has multiple Parameters, Parameter must be separated by ‘,’
- Use the command **AT+SEP** to replace the default separator to prevent conflicts

Example:

Received “1234567890”from mobile phone via SPP profile

>> +SPPDATA=10,1234567890

Call phone 10086

>> +HFPSTAT=4

>> +HFPAUDIO=1

>> +HFPSTAT=6,10086

Chapter 5

Commands Table

5.1 General Commands

5.1.1 AT+HELP - Firmware Function/Command Summary

Command	**AT+HELP**
Response	<FIRMWARE FUNCTION: appropriate working scenario > <OTA PATH: latest suitable firmware path on server for upgrade On-The-Air> <ENABLED PROFILES: LINKS: ON/OFF> … … <COMMAND SUMMARY: DESCRIPTION: PROFILE CATEGORY>
Description	Using help command to get the basic summary information

Note: If you need to upgrade to the latest version, please refer to FSC-BT631D OTA User Guide

5.1.2 AT+SEP - Read/write Event delimiter

Command	**AT+SEP{=Param}**
Param	**Setting range 0x01~0xFF, default: ‘,’ , where ‘0’ means 0xFF**
Response	Returns the current delimiter
Description	Parameters for events/responses, which may contain the same value as the default delimiter, Use this command to replace the default delimiter to prevent conflicts. (Usually the default delimiter “,” is replaced by the hexadecimal value “xFF”)

Example:Read the pairing record of the module

<< AT+PLIST

>> +PLIST=1,32808,1C5CF226D773, Tony, iPhone12

>> +PLIST=2,40, A0BC30075421, Samsung S8

>> +PLIST=E

>> OK

Example: Set the separator to ‘0xFF’

<< AT+SEP=0

>> OK

Example: Read the pairing record of the module again

<< AT+PLIST

>> +PLIST=1<FF>32808<FF>1C5CF226D773<FF>Tony, iPhone12

>> +PLIST=2<FF>40<FF> A0BC30075421<FF>Samsung S8

>> +PLIST=E

>> OK

5.1.3 AT+VER - Get Firmware Version

Command	**AT+VER**
Response	**+VER=Param1,Param2,Param3**
`Param1`	Module type
`Param2`	Firmware version
`Param3`	Production Date
Note	After upgrading the firmware, the production date will not change

Example:

<< AT+VER

>> +VER=BT631D,V2.6.1,20220922

>> OK

5.1.4 AT+BAUD - Get/Set Uart Baudrate

Command	**AT+BAUD{=Param}**
`Param`	2400/4800/9600/19200/38400/57600/115200(default)/128000/ 230400/256000/460800/512000/921600/1382400
Response	**+BAUD=Param1,Param2,Param3**
`Param`	Returns all currently supported baud rates
Description	The module will switch the baud rate immediately after receiving this command. BT631D and BT955 do not support 2400

Example:

Read module’s baudrate

<< AT+BAUD

>> +BAUD=2400,4800,9600,19200,38400,57600,115200,128000,230400,256000,
460800,512000,921600,1382400

>> OK

Set baud rate

<< AT+BAUD=9600

>> OK

5.1.5 AT+I2CREG - Read/write I2C registers

Command	**AT+I2CREG=Param1, Param2, Param3 {,Param4}**
`Param1`	i2c bus address, 2 byes hex string
`Param2`	i2c register address, 2/4 byes hex string
`Param3`	bytes to read/write (1~64)
`Param4`	value to write
Response	**+I2CREG=Param**
`Param`	Returns the current value read by I2C
Note	The current version of BT631D does not fully support this command, please do not use it. Reserved for subsequent releases.

Example:Read external I2C slave device, address:0x34, register 0003, bytes:2; and modify 0xA13B

<< AT+I2CREG= 34,0003,2

>> +I2CREG=805F

>> OK

<< AT+I2CREG= 34,0003,2,A13B

>> OK

5.1.6 AT+I2SCFG - Get/Set I2S Settings

Command	**AT+I2SCFG{=Param}**
`Param`	A base-10 representation of a bit field, for each bit
`BIT[0]`	0:disable; 1:enable
`BIT[1]`	0:master; 1:slave
`BIT[2]`	0:FS=48000Hz;1:FS=44100Hz
`BIT[3-4]`	00: I2S standard format 10: PCM short frame format
`BIT[5-6]`	00: bit depth=16bits 10: bit depth=32bits (only 16bits of MSB effective) 11: bit depth=32bits (only used for PCM mode)
Response	**+I2SCFG=Param**
Note	The current version of BT631D does not fully support this command, please do not use it. Reserved for subsequent releases.

Example:Usual configuration and description:

0	In simulation mode, the module will detect the internal/external codec through I2C at startup and report +CODEC=id
1	I2S Master; Sample rate=48000Hz; Resolution=16bits; Bit clock= 48000*16*2ch=1.536Mhz
3	I2S Slave; Sample rate=48000Hz; Resolution=16bits; Bit clock= 48000*16*2ch=1.536Mhz
65	I2S Master; Sample rate=48000Hz; Resolution=32bits; Bit clock= 48000*32*2ch=3.072Mhz
67	I2S Slave; Sample rate=48000Hz; Resolution=32bits; Bit clock= 48000*32*2ch=3.072Mhz
113	PCM Master; Sample rate=48000Hz; Resolution=16bits; Bit clock= 48000*16*2ch=1.536Mhz

5.1.7 AT+MICGAIN - Get/Set Analog Input Gain

Command	**AT+MICGAIN{=Param1,Param2}**
`Param1`	music gain (0~15, default:8)
`Param2`	call gain (0~15, default:8)
Description	Adjust Codec analog input volume

5.1.8 AT+SPKVOL - Get/Set Analog Output Volume

Command	**AT+SPKVOL{=Param1,Param2}**
`Param1`	A2DP Volume (0~15, default:10)
`Param2`	HFP Volume (0~15, default:10)
Description	Adjust Codec analog output volume

5.1.9 AT+REBOOT - Soft Reboot

Command	AT+REBOOT
Response	OK
Description	Module release all Bluetooth connections with remote device then re-boot

Example:

<< AT+REBOOT

>> OK

5.1.10 AT+RESTORE - Restore Factory Settings

Command	AT+RESTORE
Response	OK
Description	Module restore all factory settings then reboot

Example:

<< AT+RESTORE

>> OK

5.1.11 AT+BTEN - Bluetooth On/Off

Command	AT+BTEN{=Param}
`Param`	0-Power off 1-Power on

5.1.12 AT+PROFILE - Bluetooth Profile Selection

Command	**AT+PROFILE{=Param}**
`Param`	A base-10 representation of a bit field, for each bit:
`BIT[0]`	SPP (Serial Port Profile)
`BIT[1]`	GATT Server (Generic Attribute Profile)
`BIT[2]`	GATT Client (Generic Attribute Profile)
`BIT[3]`	HFP-HF (Hands-Free Profile Handsfree)
`BIT[4]`	HFP-AG (Hands-Free Profile Audio Gateway)
`BIT[5]`	A2DP Sink (Advanced Audio Distribution Profile)
`BIT[6]`	A2DP Source (Advanced Audio Distribution Profile)
`BIT[7]`	AVRCP Controller (Audio/Video remote controller Profile)
`BIT[8]`	AVRCP Target (Audio/Video remote controller Profile)
`BIT[9]`	HID Keyboard (Human Interface Profile)
`BIT[10]`	PBAP Server (Phonebook Access Profile)
`BIT[13]`	BIS/CIS Gateway (LE AUDIO gateway)
`BIT[14]`	BIS/CIS Headset (LE AUDIO headset)
`BIT[15]`	iAP2 (For iOS devices)
Response	**+PROFILE=Param**
Description	GATT Server and Client, HFP Sink and Source cannot be enabled at the same time, A2DP Sink and Source,AVRCP Controller and Target. BIS Headset can only be enabled individually. The default Profile: 9387 can be connected by the mobile phone through A2DP, and the audio will be broadcast through BIS.

Example:Read current profile selection

<< AT+PROFILE

>> +PROFILE=1195

Example:Only enable A2DP Sink, HFP Sink,disable the others

<< AT+PROFILE=160

>> OK

Example:Only enableA2DP Source,HFP Source,disable the others

<< AT+PROFILE=80

>> OK

5.1.13 AT+AUTOCONN - Turn On/Off Power On Auto Reconnect

Command	**AT+AUTOCONN{=Param}**
`Param`	Expressed in decimal bit field, format reference: AT+PROFILE
Response	**+AUTOCONN=Param**
Description	Module will attempt to connect last device after power on if set.

5.1.14 AT+STAT - Get All Profile State

Command	**AT+STAT**
Response	**+STAT=Param1, Param2, Param3…**
Description	Query the current status of all enabled Profiles

Example:Read the current Profile

<< AT+PROFILE

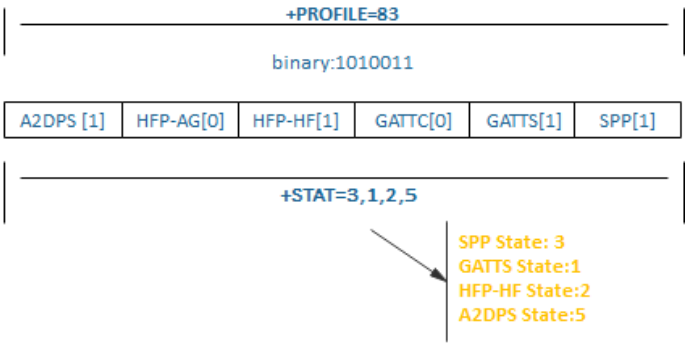
>> +PROFILE=83

Example:Read Profile status

<< AT+STAT

+STAT=3,1,2,5

>> OK



5.1.15 AT+DEVSTAT - Read Device State

Command	**AT+DEVSTAT**
Response	**+DEVSTAT=Param**
`Param`	Represented in decimal bit field,
`BIT[0]`	0: Power Off; 1: Power On
`BIT[1]`	0: BR/EDR Not Discoverable; 1: BR/EDR Discoverable
`BIT[2]`	0: BLE Not Advertising; 1: BLE Advertising
`BIT[3]`	0: BR/EDR Not Scanning; 1: BR/EDR Scanning
`BIT[4]`	0: BLE Not Scanning; 1: BLE Scanning

Example:Usual configuration and description:

0	Device power off
1	Device power on
3	Device power on, BR/EDR Discoverable
5	Device power on, BR/EDR Not Discoverable, BLE Advertising
7	Device power on, BR/EDR Discoverable, BLE Advertising
13	Device power on, BR/EDR Not Discoverable, BLE Advertising, Scanning nearby BR/EDR devices

5.1.16 AT+ADDR - Read BR/EDR Bluetooth MAC address

Command	**AT+ADDR**
Response	**+ADDR=Param**
`Param`	Module’s BR/EDR Bluetooth MAC address (12 Bytes ASCII)

Example:

<< AT+ADDR

>> +ADDR=DC0D30010203

>> OK

5.1.17 AT+LEADDR - Get BLE MAC Address

Command	**AT+LEADDR**
Response	**+LEADDR=Param**
Param	Module’s BLE Bluetooth MAC address (12 Bytes ASCII)

5.1.18 AT+NAME - Get/Set BR/EDR Local Name

Command	**AT+NAME{=Param1{,Param2}}**
Param1	BR/EDR local name(1~31 Bytes ASCII)
Param2	MAC address suffix(0/1,default:1) 0: Disable suffix 1: Enable suffix “-XXXX”(lower 4 bytes of MAC address) after local name
Response	**+NAME=Param**
Param	+NAME=Param
Description	Write local name if parameter exist, otherwise read current local name

Example:

Read current BR/EDR local name

<< AT+NAME

>> +NAME=FSC-BT631D-XXXX

>> OK

Change module’s BR/EDR local name to “ABC”,and disable suffix

<< AT+NAME=ABC,0

>> OK

Change module’s BR/EDR local name to “ABC”and enable suffix

<< AT+NAME=ABC,1

>> OK

5.1.19 AT+LENAME - Get/Set BLE Local Name

Command	**AT+LENAME{=Param1{,Param2}}**
`Param1`	BLE local name(1~25 Bytes ASCII)
`Param2`	MAC address suffix(0/1,default:1) 0: Disable suffix 1: Enable suffix “-XXXX”(lower 4 bytes of MAC address) after local name
Response	**+LENAME=Param**
Description	In BIS Headset mode, the module will actively search for and local Bluetooth BIS Gateway device with the same name and actively establish synchronization.

5.1.20 AT+SSP - Read/write BR/EDR pairing mode

Command	**AT+SSP{=Param}**
`Param`	Pairing mode (0~3, default:2) (0) Legacy pairing, use pin code for pairing (1) Secure simple pairing, auto pairing (2) Secure simple pairing, display yes/no in pairing (3) Secure simple pairing, passkey compare, user need to accept/reject pair request with command AT+CFM
Response	**+SSP=Param**
Note	Take effect after restart

5.1.21 AT+PIN - Get/Set BR/EDR Pin Code

Command	**AT+PIN{=Param}**
`Param`	Pin code(4~15 Bytes ASCII, default:0000)
Response	**+PIN=Param**
Description	Pin code only work in legacy pairing mode, see AT+SSP

Example:

Read module’s pin code

<< AT+PIN

>> +PIN=0000

>> OK

Change module’s pin code to 1234

<< AT+PIN=1234

>> OK

5.1.22 AT+CFM - Accept/reject pairing requests from the remote end

Command	**AT+CFM=Param1, Param2**
`Param1`	MAC address of the remote device(12Bytes)
`Param2`	0-Reject the remote pairing request 1-Accept pairing requests from the remote end
Description	When +SSP=3, the CFM command is valid

5.1.23 AT+COD: Get/Set Device Class

Command	**AT+COD=Param**
`Param`	Class of device(6 bytes ASCII, default:240408 Handsfree device)
Response	**+COD=Param**

Related configuration reference: COD.

5.1.24 AT+PAIR: Get/Set BR/EDR/BLE Visibility

Command	AT+PAIR=Param
Param	Mode(0-3) 0: Leave BR/EDR/BLE discoverable mode (stop advertising/broadcasting) 1: Enter BR/EDR discoverable mode (start broadcasting) 2: Enter BLE discoverable mode (start advertising) 3: Enter BR/EDR/BLE discoverable mode (start advertising/broadcasting)
Description	Module will always be discoverable if no device connected (BR/EDR or BLE), and be undiscoverable if connected with remote device, unless received this command

5.1.25 AT+PAGE: Read/write BR/EDR connectable mode

Command	AT+PAGE=Param
Param	Mode(0-1) 0: Leave BR/EDR connectable mode (stop paging) 1: Enter BR/EDR connectable mode (start paging)
Description	If no device is connected, the module will always be in connectable mode, If connected to a remote device, the module will not be connectable unless this command is received

5.1.26 AT+SCAN - Scan Nearby Devices

Command	AT+SCAN=Param1{,Param2{,Param3}}
Param1	scan type（0~2） 0: Stop scan 1: Scan nearby BR/EDR devices 2: Scan nearby BLE devices(Some programs do not support) 3: Scan nearby BR/EDR/BLE devices(Some programs do not support)
Param2	(1~48)Scan time， unit:1.28s, default:12.8s
Param3	(1~25 Bytes ASCII)filter name.
Description	Format description reference: *+SCAN - Scan Result*

5.1.27 AT+RSSI: Read BR/EDR signal strength

Command	**AT+RSSI=Param**
Param	MAC address of the currently connected device
Response	**+PIN=Param**
Param	RSSI value (-127 ~ 0)

5.1.28 AT+PLIST - Get/Delete Paired List

Command	**AT+PLIST{=Param}**
Param	(0/1~8/12 Bytes MAC address) (0) Clear all paired record (1~8) Clear specific paired record with index (MAC) Clear specific paired record with MAC address
Response1	**+PLIST=Param1, Param2, Param3{,Param4}**
Param1	(1~8) Paired device’s index
Param2	In decimal digit field, device connection profile, refer to AT+PROFILE
Param3	(MAC)Paired device’s MAC address
Param4	(UTF8)Paired device’s name
Response2	**+PLIST=E** End of the paired record

Example:Read module’s paired record

<< AT+PLIST

>> +PLIST=1,32808,1C5CF226D773, iPhone12

+PLIST=2,40, A0BC30075421, Samsung S8

+PLIST=E

>> OK

Example:Clear module’s paired record

<< AT+PLIST=0

>> OK

5.1.29 AT+DSCA - Release All Connections

Command	AT+DSCA
Description	Module release all Bluetooth connections with remote device

5.1.30 AT+AUDROUTE - Audio Route Manager

Command	AT+AUDROUTE{=Param}
`Param`	Note: HF1 & HF2 means peer Bluetooth headphones 0 Stop audio routing 1 Route music (a2dp streaming) from Module to HP1/HP2 simultaneously 2 Route voice call (hfp sco) between Module and HP1 3 Route voice call (hfp sco) between Module and HP2 4 Route voice call (hfp sco) between HP1 and HP2 (intercom mode) 5 Route voice call (hfp sco) from Module to HP1/HP2 simultaneously 6 Route music (a2dp streaming) from Module to HP1 only 7 Route music (a2dp streaming) from Module to HP2 only
Description	Some route mode require specify firmware version, refer to application note for more description: *Source mode connection*

5.1.31 AT+AUXCFG - Audio Input Mode Configuration

Command	**AT+AUXCFG{=Param}**
Param	Mode (0~3, Default:2) 0: Audio input via USB 1: Audio input via I2S 2: Audio input via A2DP 3: Audio is input via A2DP but is no longer broadcast out via BIS
Response	**+AUXCFG=Param**

5.1.32 AT+TPMODE - Turn On/Off Throughput Mode

Command	**AT+TPMODE{=Param}**
Param	Throughput mode(0~1，default:0）0: Turn Off 1: Turn On
Response	**+TPMODE=Param**
Description	When SPP/GATT profile connected and throughput mode is on, the AT command will be de-active, every byte received via physical UART will be sent to air, vice visa

5.1.33 AT+LINKCFG - Automatic search link configuration

Command	**AT+LINKCFG{=Param}**
Param	Refer to AT+PROFILE command
Description	If this command module is configured, it will automatically search for links based on the configured profile.

Example:Configure A2DP automatic search links

<< AT+PROFILE=64

>> OK

5.1.34 AT+TXPOWER - tx power configuration

Command	**AT+TXPOWER{=Param}**
`Param`	(value:0-7, Default：7)
Description	Only valid for BT631D Classic Bluetooth part

Value	Power(dBm)
0	-24
1	-20
2	-16
3	-12
4	-8
5	-4
6	0
7	4

5.2 HFP Command

5.2.1 AT+HFPSTAT - Read HFP State

Command	**AT+HFPSTAT**
Response	**+HFPSTAT=Param1{,Param2{,Param3}}**
Description	Format description reference: *+HFPSTAT - HFP State*

5.2.2 AT+HFPSR - Read/Write HFP Sample rate

Command	**AT+HFPSR{=Param}**
Param	Sampling rate during HFP call, configurable: 0/8000/16000/48000 Default:0
Response	+HFPSR=Param
Description	This parameter will override the voice call settings in AT+I2SCFG, and use this parameter to set the sampling rate of HFP I2S

5.2.3 AT+HFPCFG - Read/Write HFP configuration

Command	**AT+HFPCFG{=Param}**
Param	Expressed in decimal bit field, default: 2
BIT[0]	0-When HFP is disconnected abnormally, the link to the last disconnected device will not be restored. 1-When HFP is disconnected abnormally, the link to the last disconnected device will not be restored.
BIT[1]	0-Turn off the echo cancellation function; 1-turn on the echo cancellation function
BIT[2]	0-turn off the three-way calling function, 1-turn on the three-way calling function (the firmware needs to support the three-party calling function)

5.2.4 AT+HFPCONN - Establish HFP Connection

Command	**AT+HFPCONN{=Param}**
`Param`	MAC address of target device(12 Bytes ASCII)
Description	Reconnect to last HFP device if parameter not exist

Example:Connect to last HFP device

<< AT+HFPCONN

>> OK

Example:Connect to specific HFP device with MAC address

<< AT+HFPCONN=1C5CF226D773

>> OK

5.2.5 AT+HFPDISC - Release HFP Connection

Command	**AT+HFPDISC**
Description	Release current HFP connection with remote device

5.2.6 AT+HFPDIAL - Redial/Dial phone number

Command	**AT+HFPDIAL{=Param}**
`Param`	Phone number (1~25 Bytes ASCII)
Description	Dial specific number if parameter exist, otherwise redial

Example:Redial

<< AT+HFPDIAL

>> OK

Example:Dial “075527924639”

<< AT+HFPDIAL=075527924639

>> OK

5.2.7 AT+HFPDTMF - Send DTMF

Command	AT+HFPDTMF{=Param}
Param	DTMF (0~9/#/*)

Example:During call，send DTMF “ # ”

<< AT+HFPDTMF=#

>> OK

5.2.8 AT+HFPANSW - Pick up Incoming Call

Command	AT+HFPANSW
Description	Pick up an incoming call

5.2.9 AT+HFPCHUP - Reject/hang up incoming and outgoing calls

Command	AT+HFPCHUP
Description	Reject an incoming call or hang up an outgoing call/conversation

5.2.10 AT+HFPMCAL - Three-way call control

Command	AT+HFPMCAL=Param
Param	0: Release held call or reject waiting call 1: Release active call and accept another call 2: Hold active call and accept another call
Description	See application scenarios: *HFP three-way call operation*

5.2.11 AT+HFPADTS - Voice Switching

Command	AT+HFPADTS=Param
Param	1: Stream voice audio from module to remote device 2: Transfer voice audio from remote device to module
Description	If the parameter is empty, alternate switching

5.2.12 AT+HFPVR - Start/Stop speech recognition on remote device

Command	AT+HFPVR=Param
Param	0-Stop 1-Start
Description	Start/stop speech recognition for remote devices (e.g. Siri for iOS devices)

5.2.13 AT+HFPINFO - Read HFP current information

Command	AT+HFPINFO
Description	Returns the current HFP status, signal strength, battery, device name and other information

5.2.14 AT+MICMUTE - Mute Microphone

Command	AT+MICMUTE=Param
Param	0-unmute 1-mute
Description	Mute local microphone during calls

5.3 A2DP/AVRCP Commands

5.3.1 AT+A2DPSTAT - Read A2DP State

Command	AT+A2DPSTAT
Response	+A2DPSTAT=Param
Description	Format description reference: *+A2DPSTAT - A2DP State*

5.3.2 AT+A2DPCONN - Establish A2DP Connection

Command	AT+A2DPCONN{=Param}
`Param`	MAC address of target device(12 Bytes ASCII)
Description	Reconnect to last A2DP device if parameter not exist

5.3.3 AT+A2DPDISC - Release A2DP Connection

Command	AT+A2DPDISC
Description	Release current A2DP connection with remote device

5.3.4 AT+A2DPINFO - Read A2DP Current Information

Command	AT+A2DPINFO
Description	Returns the current A2DP status, remote device name and other information

5.3.5 AT+A2DPSR - Write A2DP Sample rate

Command	AT+A2DPSR=Param
`Param`	Sample rate:48000/44100
Description	The setting is valid in A2DP Source mode

5.3.6 AT+AVRCPSTAT - Read AVRCP State

Command	**AT+AVRCPSTAT**
Response	+AVRCPSTAT=Param
Description	Format description reference: *+AVRCPSTAT - AVRCP State*

5.3.7 AT+AVRCPCFG - Read/Write AVRCP Configuration

Command	**AT+AVRCPCFG{=Param}**
`Param`	A base-10 representation of a bit field, default:3, for each bit:
`BIT[0]`	Auto get track ID3 information (title, artist, album) on track changed.default:1
`BIT[1-3]`	Auto get track play progress if value > 0. 默认:1(second)
`BIT[4]`	Player browsing function enable/disable
`BIT[5]`	Specify a folder to automatically pull media cover images

Example: Read AVRCP Configuration

<< AT+AVRCPCFG

>> +AVRCPCFG=1

OK

Example: Set to 5 seconds to report playback progress

<< AT+AVRCPCFG=9

>> OK

5.3.8 AT+PLAYPAUSE - Track Play/Pause

Command	**AT+PLAYPAUSE**
Description	Send play or pause command to remote media player according to current play status

5.3.9 AT+PLAY - Track Play

Command	AT+PLAY
Description	Send play command to remote media player

5.3.10 AT+PAUSE - Track Pause

Command	AT+PAUSE
Description	Send pause command to remote media player

5.3.11 AT+STOP - Track Stop

Command	AT+STOP
Description	Send stop command to remote media player

5.3.12 AT+FORWARD - Track Forward

Command	AT+FORWARD
Description	Send forward command to remote media player

5.3.13 AT+BACKWARD - Track Backward

Command	AT+BACKWARD
Description	Send backward command to remote media player

5.3.14 AT+REPEAT - Set media player repeat mode

Command	**AT+REPEAT{=Param}**
`Param`	Repeat mode (0/1) 0-Turn Off 1-Turn On
Response	**+PLAYMODE=Param1,Param2**
`Param`	Format description reference: *+PLAYMODE - Media Player Repeat/Shuffle Mode*

5.3.15 AT+SHUFFLE - Set media player shuffle mode

Command	**AT+SHUFFLE{=Param}**
`Param`	Shuffle mode (0/1) 0-Turn Off 1-Turn On
Response	**+PLAYMODE=Param1,Param2**
`Param`	Format description reference: *+PLAYMODE - Media Player Repeat/Shuffle Mode*

5.3.16 AT+GETMP - Get the media player of the remote device

Command	**AT+GETMP**
Response	**+BROWDATA=Param1,Param2,Param3,Param4**
`Param`	Format description reference: *+BROWDATA - Media Player File System Browsing Data*
Description	Get the media player of the remote device. Only players with the browsable flag set support browsing. For some mobile phones (such as iOS devices), users may need to start the player on the mobile phone for the first time Please see application scenarios: *AVRCP file system browsing*

5.3.17 AT+SETMP - Select media player

Command	**AT+SETMP=Param**
`Param`	Media player index
Response	**+BROWDATA=Param1,Param2**
`Param`	Format description reference: *+BROWDATA - Media Player File System Browsing Data*
Description	To select a media player to browse, the player’ s browsable flag must be set. After selecting the player we will enter the root directory, please refer to the application scenario: *AVRCP file system browsing*

5.3.18 AT+GETFD - List Subfolders/Tracks of Selected Folder

Command	**AT+GETFD=Param1,Param2**
`Param1`	Starting position, (1~65535)
`Param2`	End position, (1~65535), Param2 >= Param1
Description	List subfolders or media items in the current folder. Please see application scenarios: *AVRCP file system browsing*

5.3.19 AT+SETFD - Select And Enter The Folder

Command	**AT+SETFD=Param**
`Param`	0:Enter up level folder other:Enter selected folder
Description	Select and enter the folder to browse. Please see application scenarios: *AVRCP file system browsing*

5.3.20 AT+GETNP - List tracks in the “Now Playing” list

Command	**AT+GETNP=Param1,Param2**
`Param1`	(1~65535),Start position
`Param2`	(1~65535),End position, Param2 >= Param1
Response	**+BROWDATA=M,Param1,Param2,Param3**
`Param`	Format description reference: *+BROWDATA - Media Player File System Browsing Data*

5.3.21 AT+ADDMP - Add tracks to media player

Command	**AT+ADDMP=Param**
`Param`	Track ID
Description	Add selected tracks to media player and start playing

5.4 PBAP 指令

5.4.1 AT+PBSTAT - Read PBAP state

Command	**AT+PBSTAT**
Response	+PBATAT=Param
Description	Format description reference: *+PBSTAT - PBAP State*

5.4.2 AT+PBCONN - Establish PBAP Connection

Command	**AT+PBCONN{=Param}**
`Param`	MAC address of target device(12 Bytes ASCII)
Description	Module will use current HFP device’ MAC address if parameter not exist For some firmware release, module will establish PBAP connection automatically on received command AT+PBDOWN

5.4.3 AT+PBDISC - Release PBAP Connection

Command	**AT+PBDISC**
Description	Release current PBAP connection with remote device

5.4.4 AT+PBDOWN - Download Phonebook

Command	**AT+PBDOWN=Param1{,Param2}**
`Param1`	Phonebook type(0-5) (0) Phonebook (SIM Storage) (1) Phonebook (Phone Storage) (2) Received call log (3) Dialed call log (4) Missed call log (5) All call log
`Param2`	Max items (1~65535, default:3000 for phonebook; 50 for call log)
Description	For some phones (e.g. iPhone), the contact download permission must be turned on in phone’s Bluetooth settting refer to application note for more description: *Phonebook/Contact photo download*

5.4.5 AT+PBABORT - Cancel Phonebook Download

Command	**AT+PBABORT**
Description	Cancel phonebook download

5.5 BIS Command

5.5.1 AT+BISCONN - Connecting to the BIS Gateway device

Command	AT+BISCONN{=Param}
Param	Target device Bluetooth name. If no parameters are provided, it will automatically search and connect to the BIS Gateway device.

5.6 CIS Command

5.6.1 AT+CISCONN - Connecting to the CIS Headset device

Command	AT+CISCONN{=Param}
Param	Target device Bluetooth name. Automatically connects to the right earpiece after connecting to the left earpiece. If no parameters are provided, it will reconnect to the previously connected device.

5.6.2 AT+AUDIOMODE - Turn On/Off CIS Mode

Command	AT+AUDIOMODE=Param
Param1	(0) Turn off CIS mode,Turn on BIS mode (1) Turn on CIS mode,Turn off BIS mode

5.6.3 AT+AUDIOCH - Select audio channel

Command	AT+AUDIOCH=Param
Param1	(0) Left audio channel (1) Right audio channel

5.6.4 AT+TALK - Turn On/Off CIS Intercom Communication

Command	AT+TALK=Param
Param1	(0) Turn off Intercom (1) Turn on Intercom
Description	The intercom feature requires establishing a CIS connection first, and the audio source of CIS cannot be A2DP. The intercom function is established between the transmitter and receiver (left audio channel) of CIS.

5.7 SPP Command

5.7.1 AT+SPPSTAT - Read SPP State

Command	AT+SPPSTAT
Response	+SPPATAT=Param
Description	Format description reference: *+SPPSTAT - SPP State*

5.7.2 AT+SPPCONN - Establish SPP Connection

Command	AT+SPPCONN{=Param}
Param	MAC address of target device(12 Bytes ASCII)

5.7.3 AT+SPPDISC - Release SPP Connection

Command	AT+SPPDISC
Description	Release current SPP connection with remote device

5.7.4 AT+SPPSEND - Send Data Via SPP

Command	**AT+SPPSEND=Param1,Param2**
`Param1`	Payload length (1~492)
`Param2`	Payload (1~492 Bytes UTF8)
Description	If throughput mode is on, this command is de-active

Example: Send data “1234567890” to remote device via SPP

<< AT+SPPSEND=10,1234567890

>> OK

5.8 GATT Server Command

5.8.1 AT+GATTSTAT - Read GATT State

Command	**AT+GATTSTAT**
Response	+GATTATAT=Param
Description	Format description reference: *+GATTSTAT - GATT State*

5.8.2 AT+GATTDISC - Release GATT Connection

Command	**AT+GATTDISC**
Description	Release current GATT connection with remote device

5.8.3 AT+GATTSEND - Send Data Via GATT

Command	**AT+GATTSEND=Param1,Param2**
`Param1`	Payload length (1~492)
`Param2`	Payload (1~492 Bytes UTF8)
Description	If throughput mode is on, this command is de-active

Example: Send data “1234567890” to remote device via GATT

<< AT+SPPSEND=10,1234567890

>> OK

5.9 GATT Client Command

5.9.1 AT+LECONN - GATT Server Connection

Format	**+LECONN=Param1,Param2 {, Param3{, Param4}}**
Param1	12-byte device address + 1-byte address type（0:public,1:random）
Param2	ServiceUUID (16 or 128 bit)
Param3	WriteUUID (16 or 128 bit)
Param4	NotifyUUID (16 or 128 bit)
Description	Initiates a connection to the specified device. The parameter consists of 12 bytes (device address) and 1 byte (address type). Generally, the address type is 0 or 1. The address type is obtained by using the AT+SCAN=2 command to scan the third parameter returned :ref: ‘REF100’ Example :+SCAN=0,-74,2,DD0D30037591 indicates that the LE device broadcasts data

Example: Connect the GATT Server with DD0D30037591. The ServiceUUID is 0xFFF0, WriteUUID is 0xFFF2, and NotifyUUID is 0xFFF1

<< AT+LECONN=DD0D300375911,FFF0,FFF2,FFF1

<< OK

5.9.2 AT+LEDISC - Release GATT Connection

Command	**AT+LEDISC**
Description	Disconnect the current GATT connection from the remote device

5.9.3 AT+LESEND - Send Data Via GATT

Format	**+LESEND=Param1,Param2**
`Param1`	Payload length
`Param2`	Payload
Description	If throughput mode is on, this command is de-active

Example: Send data to remote device through GATT Client "1234567890"

<< AT+LESEND=10,1234567890

>> OK

5.10 HID Command

5.10.1 AT+HIDSTAT - Read HID State

Command	**AT+HIDSTAT**
Response	+HIDATAT=Param
Description	Format description reference: *+HIDSTAT - HID State*

5.10.2 AT+HIDCONN - Establish HID Connection

Command	**AT+HIDCONN{=Param}**
`Param`	MAC address of target device(12 Bytes ASCII)

5.10.3 AT+HIDDISC - Release HID Connection

Command	**AT+HIDDISC**
Description	Release current HID connection with remote device

5.10.4 AT+HIDMODE - Get/Set HID Input Mode

Command	**AT+HIDMODE{=Param}**
`Param`	HID keyboard input mode(0~1), default 1 (0) Hex key code (1) Ascii key code (English)
Note	Module can support various keyboard language with specify firmware, such as: TURKEY SPAIN PORTUGAL FRANCE GERMANY ITALY CZECH JAPAN

5.10.5 AT+HIDDLY - Get/Set HID Report Period

Command	**AT+HIDDLY{=Param}**
`Param`	HID report period in millisecond, default 10 ms

5.10.6 AT+HIDSEND - Send HID Keyboard Report

Command	**AT+HIDSEND=Param1,Param2**
`Param1`	Report length
`Param2`	Report payload
Note	For special key code: 0x0D -> ENTER 0x08 -> BACKSPACE 0x09 -> TAB 0x20 -> SPACE
Description	If throughput mode is on, this command is de-active

Example: Send key code ‘A’ to remote device (on AT+HIDMODE=1)

>> AT+HIDSEND=1,A

<< OK

Example: Send key code ‘4’ to remote device (on AT+HIDMODE=0)

<< AT+HIDSEND=4, xA1 x01 x00 x04

>> OK

Note: As payload is hex value, hence actual command is:

41 54 2B 48 49 44 53 45 4E 44 3D 34 2C A1 01 00 04 0d 0a

Where:

A1 : report start

01 : page id 1

00 : modifier

04 : key code

Module will auto send debounce key code by itself

5.10.7 AT+HIDCMD - Send HID User Report

Command	AT+HIDCMD=Param
Param	2 bytes hid user report e.g., for iPhone: Play/Pause: 00 CD Stop: 00 B7 Forward: 00 B5 Backward: 00 B6 Fast Forward: 00 B3 Rewind:00 B4 Record:00 B2 VolumpUp:00 E9 VolumpDn:00 EA Mute:00 E2 On screen keyboard Toggle:01 AE
Description	If throughput mode is on, this command is de-active

Example: Send Volume Up to iPhone

<< AT+HIDCMD= x00 xE9

>> OK

Note: As the payload is hex value, hence actual command is:

41 54 2B 48 49 44 43 4D 44 3D 00 E9 0D 0A

Chapter 6

Events Table

6.1 General Events

6.1.1 +PWRSTAT - Power on status

Format	**+PWRSTAT=Param**
`Param`	0-Powering off 1-Powering on(booting)
Description	It is not recommended to use AT commands during power on and off.

6.1.2 +SCAN - Scan Result

Format1	**+SCAN =Param1,Param2,Param3, Param4,Param5,Param6**
Param1	Index
Param2	RSSI (-127 ~ -1)
Param3	Device address type (0~3) (0) BR/EDR address (1) LE public address (2) LE random address (3) iOS device with Carplay support
Param4	MAC address (12 Bytes ASCII)
Param5	BR/EDR device name or LE device broadcast data
Param6	Device type(6 Bytes ASCII)
Format2	+SCAN=E: Stop scan

Example: Scan BR/EDR nearby devices

<< AT+SCAN=1

>> OK

+SCAN=1,-32,3,B019C66209FA,wt-iphone,7A020C

+SCAN=2,-74,0,DC0D30000053,BW226,040680

+SCAN=3,-43,0,00158354F994,LAPTOP-3L,120104

+SCAN=E

6.1.3 +PAIRREQ - Pairing Request

Format	**+PAIRREQ=Param1,Param2{,Param3}**
Param1	Passkey (000000~999999)
Param2	The MAC address of the currently paired device (12 Bytes ASCII)
Param3	The name of the currently paired device

6.1.4 +PAIRED - Pair Result

Format	+PAIRED=Param1,Param2
Param1	Pair Result (0)-Success (1~255)-Failure reason
Param2	The MAC address of the currently paired device (12 Bytes ASCII)

6.1.5 +CODEC - Codec ID

Format	+CODEC=Param
Param	Code id
Description	This command is currently invalid, please ignore it

6.2 HFP Events

6.2.1 +HFPSTAT - HFP State

Format	+HFPSTAT=Param1{,Param2{,Param3}}
Param1	(0~10) (0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Outgoing call (5) Incoming call (6) Active call (7) Active held (3-way-calling) (8) First call active, second call waiting (3-way-calling) (9) First call active, second call held (3-way-calling) (10) First call outgoing, second call held (3-way-calling)
Param2	Phone number, When status>3
Param3	Phone number (three-way call)

Example: Call 10086

<< AT+HFPDIAL=10086

>> +HFPSTAT=3

>> +HFPSTAT=4,10086

>> +HFPAUDIO=1

Example: The call is coming and the number is 13265463800

>> +HFPSTAT=5, 13265463800

>> +HFPAUDIO=1

6.2.2 +HFPDEV - HFP Remote Device Information

Format	+HFPDEV=Param1{,Param2}
Param1	(12 Bytes ASCII), 当前 HFP 连接远端设备的 MAC 地址
Param2	(UTF8), 当前 HFP 连接远端设备的名称

Example: HFP connect success with device

>> +HFPDEV=1C5CF226D774, iPhone

6.2.3 +HFPAUDIO - HFP Voice Audio State

Format	+HFPAUDIO=Param
Param	(0) HFP voice audio disconnected, audio input/output routed to remote device (1) HFP voice audio connected, audio input/output routed to module

6.2.4 +HFPSIG - HFP Remote Device Network Signal Strength

Format	+HFPSIG=Param
Param	(0~5) Network signal strength of remote device

6.2.5 +HFPROAM - HFP Remote Device Roaming State

Format	+HFPROAM=Param
Param	(0/1) Roaming state of remote device

6.2.6 +HFPBATT - HFP Remote Device Battery Level

Format	+HFPBATT=Param
Param	(0~5) Battery level of remote device

6.2.7 +HFPNET - HFP Remote Device Network Operator Selection

Format	+HFPNET=Param
Param	(UTF8) Network operator selection of remote device

6.2.8 +HFPMANU - HFP Remote Device Manufacture

Format	+HFPMANU=Param
Param	(UTF8) Manufacture name of remote device

6.2.9 +HFPNUM - HFP Remote Device Phone Subscriber Number

Format	+HFPNUM=Param
Param	(ASCII) Phone subscriber number of remote device

6.2.10 +HFPIBR - HFP Remote Device In-band-ring Support

Format	+HFPIBR=Param
Param	0-No support 1-support
Description	Report whether the current connected phone support in-band-ring

6.2.11 +HFPRING - HFP Remote Device n-band-ring Indication

Format	+HFPRING=Param
Param	0-No support in-bang-ring 1-support in-band-ring
Description	The mobile phone is ringing when the call comes. If the remote mobile phone does not support in-band-ring, the module plays the local ring-tone.

6.3 A2DP/AVRCP Events

6.3.1 +A2DPSTAT - A2DP State

Format	+A2DPSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Paused (5) Streaming

6.3.2 +A2DPDEV - A2DP Remote Device Information

Format	+A2DPDEV=Param1{,Param2}
Param1	(12 Bytes ASCII), Remote device’s MAC address of current A2DP connection
Param2	(UTF8), Remote device’s name of current A2DP connection

6.3.3 +AVRCPSTAT - AVRCP State

Format	+AVRCPSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected

6.3.4 +PLAYSTAT - Media Player State

Format	+PLAYSTAT=Param
Param	(0) Stopped (1) Playing (2) Paused (3) Fast Forwarding (4) Fast Rewinding

6.3.5 +PLAYMODE - Media Player Repeat/Shuffle Mode

Format	+PLAYMODE=Param1,Param2
Param1	Repeat Mode (1~4) (1) Off (2) Single Track (3) All Tracks (4) Group
Param2	Shuffle Mode (1~3) (1) Off (2) All Tracks (3) Group

6.3.6 +TRACKSTAT - Media Player Play Progress

Format	+TRACKSTAT=Param1,Param2,Param3
Param1	(0~4), Media Player State, see +PLAYSTAT
Param2	(Decimal ASCII),Elapsed time of current track in millisecond
Param3	(Decimal ASCII),Total time of current track in millisecond

Example: Read media player play progress every 1s

>> +TRACKSTAT=1,54000,322000

>> +TRACKSTAT=1,55000,322000

>> +TRACKSTAT=1,56000,322000

6.3.7 +TRACKINFO - Media Track Information

Format	+TRACKINFO=Param1,Param2,Param3
Param1	title
Param2	artist
Param3	album

Example: Phone playing song “Creep-Radio Head”

>> +TRACKINFO=Creep,Radiohead,Pablo Honey

6.3.8 +BROWSTAT - Media Browsing Status

Format	+BROWSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Browsing

6.3.9 +BROWDATA - Media Player File System Browsing Data

Format	**+BROWDATA=Param1, Param2 {, Param3{, Param4}}**
Param1	Browsing type, for each type, the following data represents:
P	Parame1: media player information Parame2: 0 –support browsing; 1- not support browsing Parame3: media player id Parame4: media player name
R	Parame1: root dictionary name Parame2: root dictionary name
F	Parame1: folder ID and name Parame2: folder ID Parame3: folder name
M	Parame1: media track ID and name Parame2: media track ID Parame3: media track name
E	Parame1: browsing operation result code Parame2: 0 - browsing success; other - browsing error code
Description	Please see application scenarios: *AVRCP file system browsing*

6.3.10 +BIPSTAT - BIP State

Format	+BIPSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Downloading
Description	BIP configuration files are now only used for media player cover image downloads, please see application scenarios: *AVRCP album image download*

6.3.11 +COVERART - Media Track Cover Downloaded Successfully

Format	+COVERART=Param
Param	Image ID
Description	The cover image is placed in the specified folder named ImageID.jpg. Please refer to the application scenario: *AVRCP album image download*

6.4 Phonebook Access Events

6.4.1 +PBSTAT - PBAP State

Format	+PBSTAT=Param
`Param`	(0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Downloading

6.4.2 +PBCNT - Phonebook Entries of Remote Device

Format	+PBCNT=Param
`Param`	Phonebook entries of remote device

6.4.3 +PBDATA - Phonebook Data

Format1	**+PBDATA=Param1,Param2,Param3{,Param4}**
Param1	Type (0) Phonebook (SIM Storage) (1) Phonebook (Phone Storage) (2) Received call log (3) Dialed call log (4) Missed call log
Param2	Name
Param3	Number
Param4	(15 Bytes ASCII), Call time if current download type is call log Format: Year(4Bytes) Month(2Bytes) Day(2Bytes) T(1Byte) Hour(2Bytes) Minute(2Bytes) Second(2Bytes). e.g. 20161012T152826 represents 2016/10/12/15/28/26
Format2	+PBDATA=E Download complete
Description	Call time may not exist for some mobile phones

Example: Download all phonebook

<< AT+PBDOWN=1

>> +PBCNT=234

+PBDATA=1 , Jack , 18219146201

+PBDATA=1 , kenan , 8613771972680

……

+PBDATA=E

Example: Download 10 dialed call log

<< AT+PBDOWN=3,10

>> +PBDATA=3 , China Mobile , 10086 , 20171013T103516

+PBDATA=3 , Jerry , 18688967507 , 20171012T152826

……

+PBDATA=E

6.5 SPP Events

Note: Because the instructions of IAP2 (Apple Accessory Protocol) and AAP (Android Auto Protocol) are almost the same as SPP, they are:

+IAPSTAT, +IAPDATA for iAP2 profile

+AAPSTAT, +AAPDATA for AAP profile

The documentation will ignore these instructions, and the default BT631D does not support this instruction.

6.5.1 +SPPSTAT - SPP State

Format	**+SPPSTAT=Param**
`Param`	(0) Unsupported (1) Standby (2) Connecting (3) Connected

6.5.2 +SPPDATA - SPP Received Incoming Data

Format	+SPPDATA=Param1,Param2
Param1	Payload length
Param2	Payload

Example: Received data “1234567890” from remote device via SPP

<< +SPPDATA=10,1234567890

6.6 GATT Events

6.6.1 +GATTSTAT - GATT State

Format	+GATTSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected

6.6.2 +GATTDATA - GATT Received Incoming Data

Format	+SPPDATA=Param1,Param2
Param1	Payload length
Param2	Payload

Example: Received data “1234567890” from remote device via GATT

<< +GATTDATA=10,1234567890

6.7 HID Events

6.7.1 +HIDSTAT - HID State

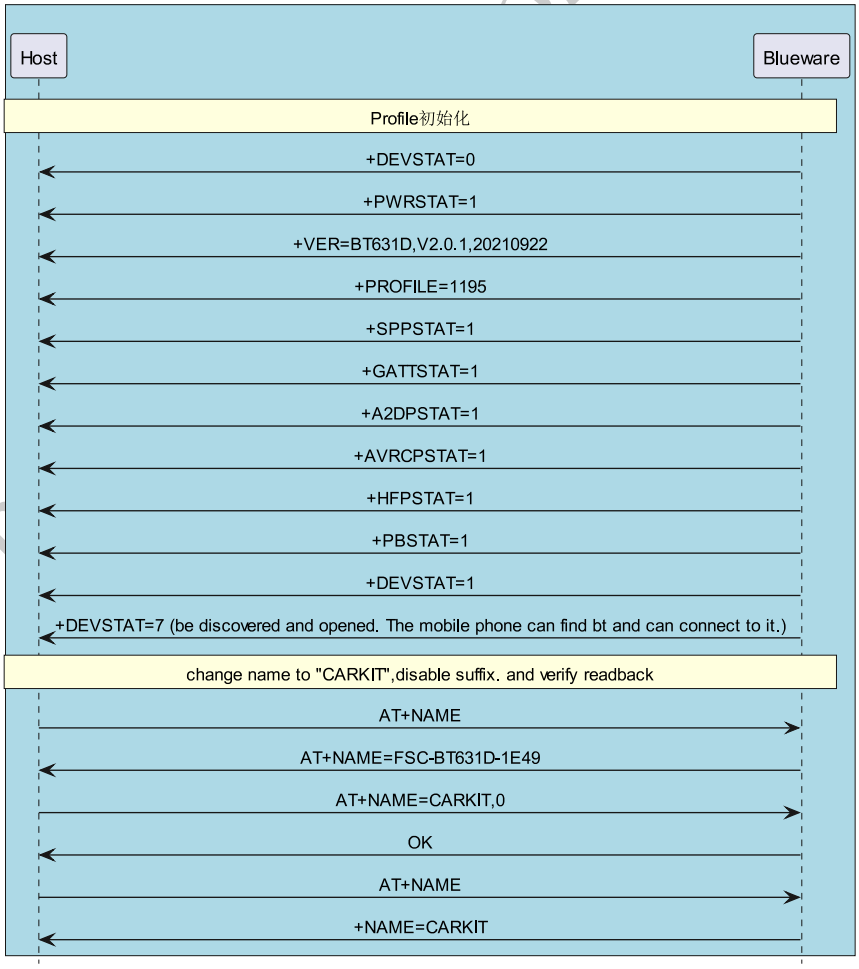
Format	+HIDSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected

Chapter 7

Application scenarios

7.1 Profiles initializing and change parameter

The following figure shows Profile initialization and name modification

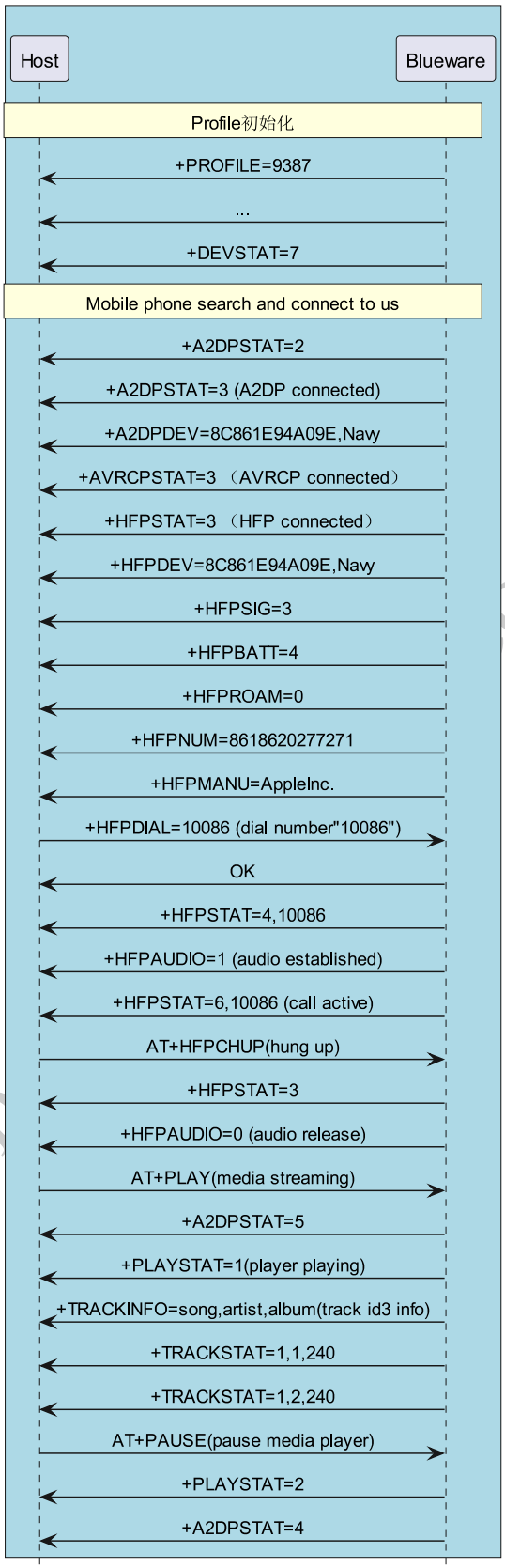


MCU change device name CARKIT reference code:

```
void change_name(void)
{
    uart_send("AT+NAME\r\n");
    if(uart_read("+NAME",name_buf))
    {
        if(memcmp(name_buf,"CARKIT",6))
        {
            uart_send("AT+NAME=CARKIT,0\r\n");       //defalut disable MAC address suffix
            uart_send("AT+NAME\r\n"); // read bt name
            if(uart_read("+NAME",name_buf))
            {
                if(memcmp(name_buf,"CARKIT",6))
                {
                    //change name fail
                }
                else
                {
                    //change name success
                }
            }
        }
    }
}
```

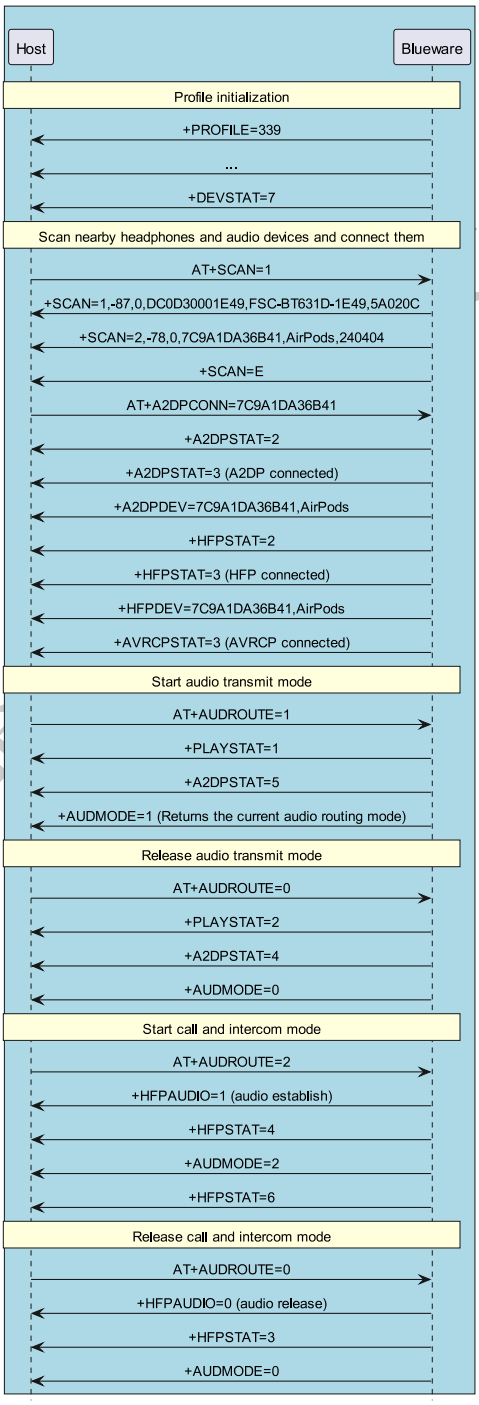
7.2 Sink mode connection

Note: BT631D default: AUXCFG=2,PROFILE=9387


Host
Blueware
Profile初始化
+PROFILE=9387
...
+DEVSTAT=7
Mobile phone search and connect to us
+A2DPSTAT=2
+A2DPSTAT=3 (A2DP connected)
+A2DPDEV=8C861E94A09E,Navy
+AVRCPSTAT=3 （AVRCP connected）
+HFPSTAT=3 （HFP connected）
+HFPDEV=8C861E94A09E,Navy
+HFPSIG=3
+HFPBATT=4
+HFPROAM=0
+HFPNUM=8618620277271
+HFPMANU=AppleInc.
+HFPDIAL=10086 (dial number"10086")
OK
+HFPSTAT=4,10086
+HFPAUDIO=1 (audio established)
+HFPSTAT=6,10086 (call active)
AT+HFPCHUP(hung up)
+HFPSTAT=3
+HFPAUDIO=0 (audio release)
AT+PLAY(media streaming)
+A2DPSTAT=5
+PLAYSTAT=1(player playing)
+TRACKINFO=song,artist,album(track id3 info)
+TRACKSTAT=1,1,240
+TRACKSTAT=1,2,240
AT+PAUSE(pause media player)
+PLAYSTAT=2
+A2DPSTAT=4

7.3 Source mode connection

Note: The transmission(source) mode connection needs to configure the module to A2DP Source, HFP Source By default, the program will not actively enter audio transmission mode or call (intercom) mode after connecting to headphones or speakers. You need to send instructions: Start audio transmission (AT+AUDROUTE=1) Start call (AT+AUDROUTE=2)



MCU connects AirPods and starts audio transmission. Reference code:

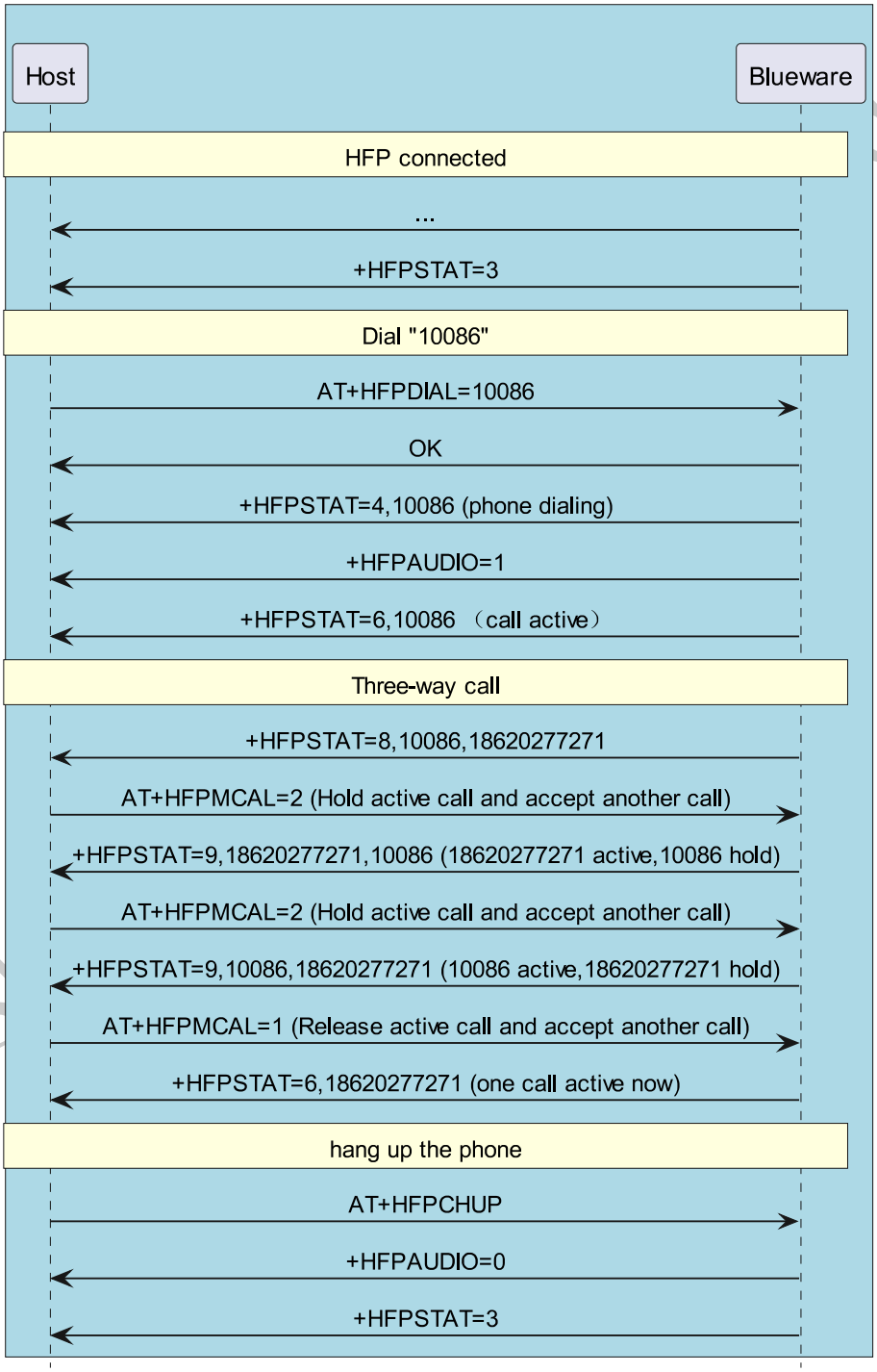
```
#define PROFILE_HFP_HF                  (uint16)(BIT3)
#define PROFILE_HFP_AG                  (uint16)(BIT4)
#define PROFILE_A2DP_SINK               (uint16)(BIT5)
#define PROFILE_A2DP_SOURCE             (uint16)(BIT6)

void bt_connect(void)
{
    //enable hfp source,a2dp source,avrcp tg,spp,gatt
    uart_send("AT+PROFILE=339\r\n"); //if profile changes,module will auto reboot,
    wait_ms(500);
    uart_send("AT+PROFILE\r\n");
    uint32 profiles = uart_read("+PROFILE",profiles);
    if(profiles & (PROFILE_A2DP_SOURCE|PROFILE_HFP_AG))
    {
        uint8 addr[6];
        uint8 buf[30]={0};
        uint8 a2dp_state=0
        uart_send("AT+SCAN=1\r\n");
        uart_read_scan_addr("+SCAN",addr);
        sprintf(buf,"AT+A2DPCONN=%s\r\n",addr);
        uart_send(buf); //send a2dp connect

        uart_read("+A2DPSTAT",a2dp_state);
        if(a2dp_state == 3) //a2dp connected
        {
            uart_send("AT+AUDROUTE=1"); // start a2dp audio
        }
        uart_read("+A2DPSTAT",a2dp_state);
        if(a2dp_state == 5)
        {
            //a2dp streaming
        }
    }
    else
    {/*not support master*/}
}
```

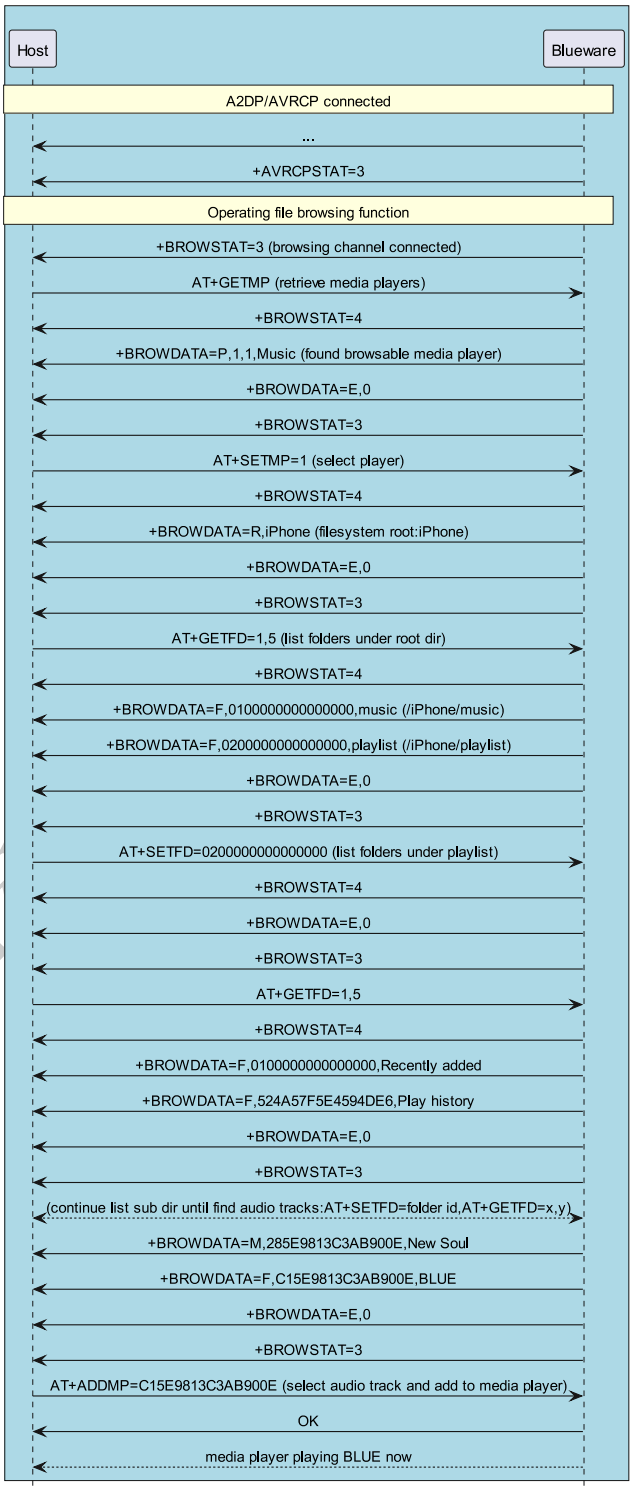
7.4 HFP three-way call operation

Note: BT631D and other modules do not turn on the three-way calling function. If you need to test this function, please contact Feiyitong.



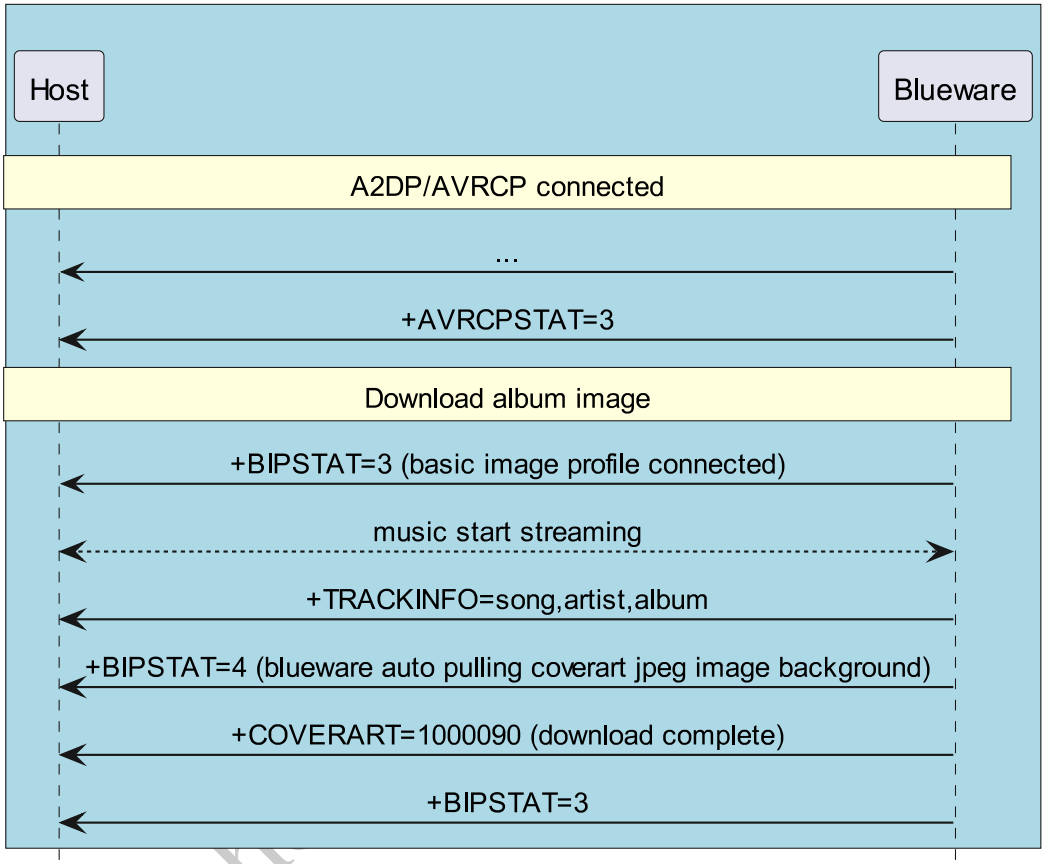
7.5 AVRCP file system browsing

Note: The BT631D module does not open this function. If you need to test this function, please contact Feitong.



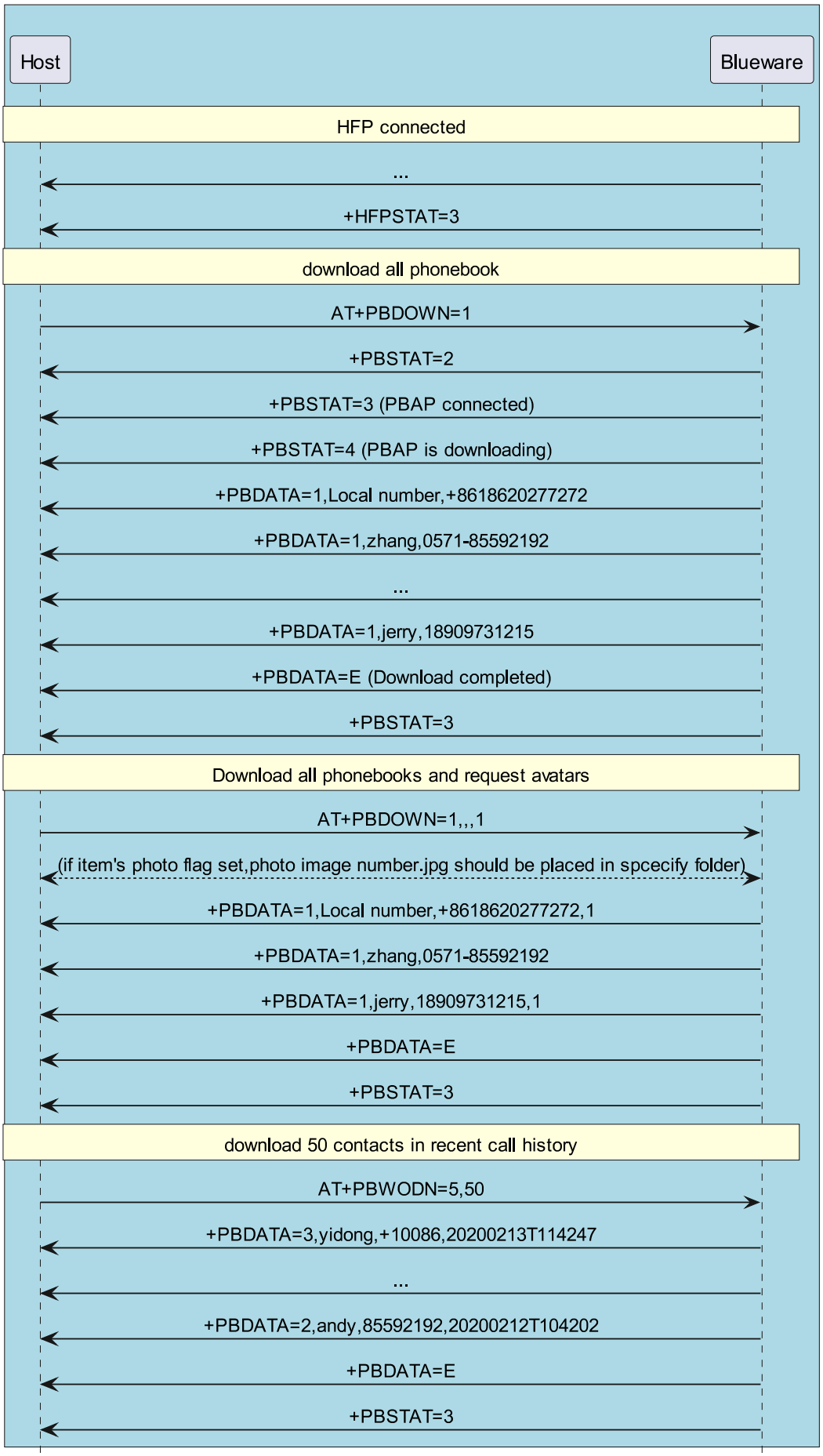
7.6 AVRCP album image download

Note: Album image downloading is only supported by the vehicle protocol stack module, BT631D module does not support.



7.7 Phonebook/Contact photo download

Note: Contact photo Only supported by vehicle protocol stack module, not supported by BT631D module


Host
Blueware
HFP connected
...
+HFPSTAT=3
download all phonebook
AT+PBDOWN=1
+PBSTAT=2
+PBSTAT=3 (PBAP connected)
+PBSTAT=4 (PBAP is downloading)
+PBDATA=1,Local number,+8618620277272
+PBDATA=1,zhang,0571-85592192
...
+PBDATA=1,jerry,18909731215
+PBDATA=E (Download completed)
+PBSTAT=3
Download all phonebooks and request avatars
AT+PBDOWN=1,,,1
(if item's photo flag set,photo image number.jpg should be placed in spcecify folder)
+PBDATA=1,Local number,+8618620277272,1
+PBDATA=1,zhang,0571-85592192
+PBDATA=1,jerry,18909731215,1
+PBDATA=E
+PBSTAT=3
download 50 contacts in recent call history
AT+PBWODN=5,50
+PBDATA=3,yidong,+10086,20200213T114247
...
+PBDATA=2,andy,85592192,20200212T104202
+PBDATA=E
+PBSTAT=3

Chapter 8

Appendix

8.1 Download PDF Document

Download PDF Document