BT1036 programming user guide

Release 6.1

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Chapter 1

Introduction

[中文]

1.1 Description

This design guide is suitable for engineers to develop FSC-BT1036 series Bluetooth modules, also suitable for BT955, BT936B, BT909C, BT906 series modules

1.2 Module Default Settings

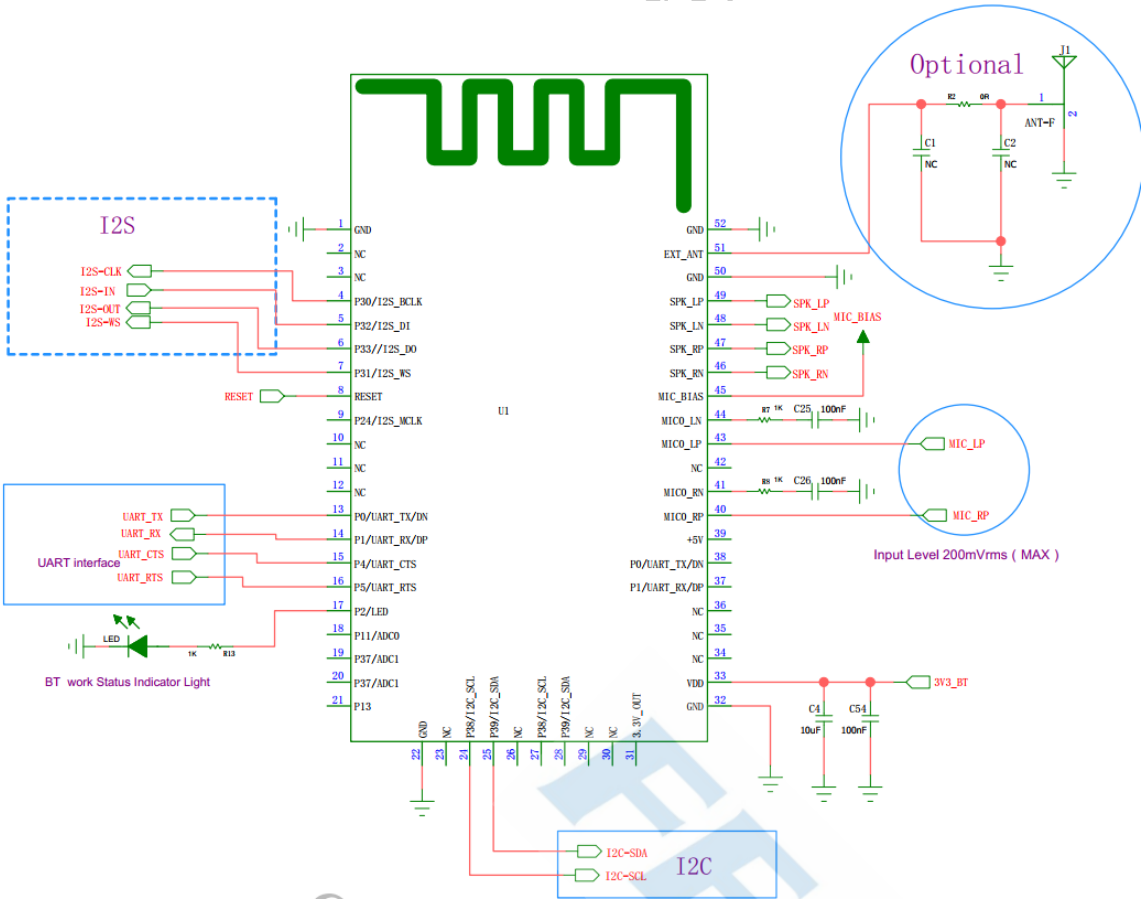
Name	FSC-BT1036-XXXX
LE-Name	FSC-BT1036-LE-XXXX
Pin Code	0000
Secure Simple Pairing Mode	ON
UART Baudrate	115200/8/N/1

Chapter 2

Hardware Description

2.1 Pin Diagram

FSC-BT1036C as an example:



2.2 Pin Description

Pin	Pin Name	Type	Pin Descriptions
4	I2S_CLK	I/O	I2S BCLK
5	I2S_IN	I	I2S DATA IN
6	I2S_OUT	O	I2S DATA OUT
7	I2S_WS	I/O	I2S SYNC
8	RESET	I	External reset input: active Low
13	UART_TX	O	UART TX
14	UART_RX	I	UART RX
15	UART_CTS	I/O	UART CTS
16	UART_RTS	I/O	UART RTS(default: PA mute pin)
17	LED0	I/O	Output square wave in pairing mode, output high level when bluetooth is connected
18	LED1	I/O	SPP/GATT is not connected to output low level, connected to output high level
32	GND	GND	GND
33	VDD	VDD	Power supply for I/O ports, DC 3.3V
40	MIC_RP	Audio	MIC0/Line_IN differential R input, positive
41	MIC_RN	Audio	MIC0/Line_IN differential R input, negative
43	MIC_LP	Audio	MIC0/Line_IN differential L input, positive
44	MIC_LN	Audio	MIC0/Line_IN differential L input, negative
45	MIC_BASE	Audio	MIC Power Supplies
46	SPK_RN	Audio	Headphone/speaker differential R output, negative
47	SPK_RP	Audio	Headphone/speaker differential R output, positive
48	SPK_LN	Audio	Headphone/speaker differential L output, negative
49	SPK_LP	Audio	Headphone/speaker differential L output, positive
51	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/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

3.1 Compare related products

Module	BT	Tx Power	Size(W*L*H mm)	Chip	Audio
BT1036A	5.2	10dBm	10*11.9*1.8	FSC2061	Stereo Input/Output
BT1036B	5.2	10dBm	13*26.9*2.4	FSC2061	Stereo Input/Output
BT1036C	5.2	10dBm	13*26.9*1.8	FSC2061	Stereo Input/Output
BT955	5.2	10dBm	13*26.9*1.8	FSC2081	Mono Input/Stereo Output
BT936A	4.2	8.5dBm	10*11.9*1.8	CSR8811	Mono Input/Stereo Output
BT936B	4.2	8.5dBm	13*26.9*2.4	CSR8811	Mono Input/Stereo Output
BT909C	4.2	20dBm	13*26.9*2.4	CSR8811	Mono Input/Stereo Output
BT966	5.0	12dBm	13*26.9*2.4	CYW20706	Stereo Input/Output
BT901	4.2	8.5dBm	10*11.9*1.8	CSR8811	No
BT906	4.2	8.5dBm	13*26.9*2.4	CSR8811	Mono Input/Stereo Output
BT909	4.2	20dBm	13*26.9*2.4	CSR8811	No
BT1026C	5.1	9dBm	13*26.9*1.8	QCC3024	Stereo Input/Output
BT1026D	5.1	9dBm	13*26.9*1.8	QCC3034	Stereo Input/Output

Note

- BT90X series modules have been discontinued. Corresponding replacement modules:: BT901->BT936A, BT906->BT936B,BT909->BT909C
- BT966 series modules have been discontinued. Corresponding replacement modules:: BT966->BT1036B, BT966C->BT1036C
- Among them, BT1026C/BT1026D only support audio sink mode, not support source mode.
- Other modules can use the AT+PROFILE command to configure audio sink mode or audio source mode。sink and source cannot exist at the same time.

3.2 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)

3.3 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 “ERR<code>” 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-BT1036-XXXX

>> OK

Example: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 command AT+SEP to replace default separator for conflict prevention

Example: Received “1234567890” from mobile phone via SPP profile

>> +SPPDATA=10,1234567890

Example: Dial number “10086” using a mobile phone when HFP connected

>> +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

5.1.2 AT+SEP - Get/Set Event/Response Separator

Command	**AT+SEP{=Param}**
`Param`	hex value 0x01~0xFF, default: ‘,’, specially, using ‘0’ instead of ‘xFF’ for convenience
Response	**+SEP=Param**
Description	The parameter of events/responses may contain value same to the default separator, using this command to replace default separator for conflict prevention (replace the default separator ‘,’ to hex value ‘xFF’ typically)

Example:Read module’s paired record (device name contains ‘,’ already)

<< AT+PLIST

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

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

>> +PLIST=E

>> OK

Example: Replace separator to ‘0xFF’

<< AT+SEP=0

>> OK

Example: Read module’s paired record 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`	Data of production
Note	The date of production in response will not be changed after firmware upgrade

Example:

<< AT+VER

>> +VER=BT1036,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`	All baudrates supported by current module
Description	Module will change baudrate to target value immediately or after reboot depending on firmware

Example:Query baudrates supported by current module then change baudrate from 115200 bps to 921600 bps

<< AT+BAUD

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

>> OK

<< AT+BAUD=921600

>> OK

Module switch baudrate to 921600 immediately, host change baudrate as well, query module’s name at new baudrate

<< AT+NAME

>> +NAME=FSC-BT91036-1F26

>> OK

5.1.5 AT+I2CREG - Read/Write I2C Register

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`	i2c read return value
Description	Command can be used only if module’s build-in codec is disabled, the i2c bus is master by default.

Example:Read external i2c slave device, address:0x34, register 0003, bytes:2; then modify value to 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, default:0, 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**
Description	The BT90X modules support serval external codecs by default, e.g. ES8388, TLV320AIC3204 and etc. BT1036/BT955 built-in codec If +I2SCFG=0, module will auto detect on of them on booting
Note	Use command AT+HFPSR for setting HFP voice call sample rate

Example:usual configuration and description

0	Analog mode, module will probe internal/external codecs via I2C on booting, and will report +CODEC= id to indicate user which codec has been recognized
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{=Param}**
`Param`	Gain (0~15, default:8)
Description	Adjust codec analog input gain, only work for module with codec build in (unavailable for I2S input)

5.1.8 AT+SPKVOL - Get/Set Analog Output Volume

Command	**AT+SPKVOL{=Param1,Param2}**
`Param1`	Volume for A2DP Streaming (0~15, default:8)
`Param2`	Volume for HFP Call (0~15, default:8)
Description	Adjust codec analog output gain, only work for module with codec build in (unavailable for I2S output)

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[15]	*** (For iOS devices)
Response	**+PROFILE=Param**
Description	GATT Server and Client, HFP Sink and Source, A2DP Sink and Source, AVRCP Controller and Target cannot be enabled simultaneously because of mutual exclusion.

Example:Read current profile selection

<< AT+PROFILE

>> +PROFILE=1195

Example:Enable SPP, GATT Server, HFP Source, A2DP Source profile, disable the others

<< AT+PROFILE=83

>> OK

Example:Enable SPP, A2DP Sink, disable the others

<< AT+PROFILE=33

>> OK

5.1.13 AT+AUTOCONN - Power On Auto Reconnect Profile Selection

Command	**AT+AUTOCONN{=Param}**
`Param`	A base-10 representation of a bit field, format same with AT+PROFILE
Response	**+AUTOCONN=Param**
Description	Module will attempt to establish connection to devices in paired list after power on.

5.1.14 AT+STAT - Get All Profile State

Command	**AT+STAT**
Response	**+STAT=Param1, Param2, Param3…**
Description	Query all current enabled profile’ s state

Example: Read current profile selection

<< AT+PROFILE

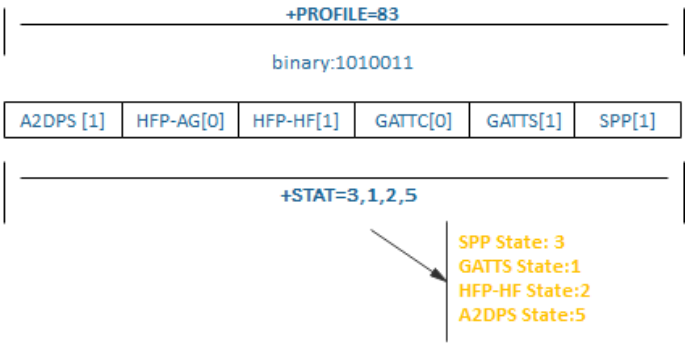
>> +PROFILE=83

Example:Read profile state

<< AT+STAT

+STAT=3,1,2,5

>> OK



5.1.15 AT+DEVSTAT - Read Device State

Command	**AT+DEVSTAT**
Response	**+DEVSTAT=Param**
`Param`	A base-10 representation of a bit field, for each bit:
`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 combination 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 - Get BR/EDR MAC Address

Command	**AT+ADDR**
Response	**+ADDR=Param**
`Param`	Module’s BR/EDR 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 LE 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**
Description	Write local name if parameter exist, otherwise read current local name

Example:Read current BR/EDR local name

<< AT+NAME

>> +NAME=FSC-BT1036-XXXX

>> OK

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

<< AT+NAME=ABC,0

>> OK

Example: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**

5.1.20 AT+SSP - Get/Set 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	need reboot

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

Example: Change module’s pin code to “1234”

<< AT+PIN=1234

>> OK

5.1.22 AT+CFM - Accept/Reject Remote Pairing Request

Command	AT+CFM=Param1, Param2
Param1	12 Bytes MAC address of remote device
Param2	0-Reject remote pairing request 1-Accept remote pairing request
Description	Only used for pairing request in pairing mode 3, see AT+SSP

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: Get/Set BR/EDR Connectability

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	Module will always be connectable mode if no device connected, and be unconnectable if connected with remote device, unless received this command

5.1.26 AT+SCAN - Scan Nearby Devices

Command	AT+SCAN=Param1{,Param2{,Param3}}
Param1	scan type(0~3) 0: Stop scan 1: Scan nearby BR/EDR devices 2: Scan nearby BLE devices 3: Scan nearby BR/EDR/BLE devices
Param2	(1~48)Scan period. unit:1.28s, default:12.8s
Param3	(1~25 Bytes ASCII)Name filter. Filter scan results with name if set
Description	Format description reference: *+SCAN - Scan Result*

5.1.27 AT+RSSI: Get BR/EDR Signal Strength

Command	**AT+RSSI=Param**
Param	12 Bytes MAC address of current 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	A base-10 representation of a bit field, support profiles of device, see 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+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

5.1.32 AT+LINKCFG - Auto search link configuration

Command	AT+LINKCFG{=Param}
Param	Format reference AT+PROFILE command
Description	If this command module is configured, it will automatically search for links according to the configured profile.

Example:Configure A2DP to automatically search for links

<< AT+PROFILE=64

>> OK

5.1.33 AT+TXPOWER - tx power configuration

Command	AT+TXPOWER{=Param}
Param	(value:0-15, default:15)

Value	Power(dBm)
0	-36.1
1	-8.2
2	-2.9
3	0.5
4	2.3
5	4.1
6	5.4
7	6.5
8	7.2
9	8.0
10	8.6
11	9.1
12	9.4
13	9.8
14	10.0
15	10.2

5.2 HFP Commands

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 - Get/Set HFP Sample Rate

Command	AT+HFPSR{=Param}
Param	Sample rate (Hz) for HFP voice call, available value: 0/8000/16000/48000
Response	+HFPSR=Param
Description	Resample HFP voice call to specify rate in I2S mode, the parameter will override settings in AT+I2SCFG for voice call

5.2.3 AT+HFPCFG - Get/Set HFP Configuration

Command	AT+HFPCFG{=Param}
Param	A base-10 representation of a bit field, default:2, for each bit:
BIT[0]	When the HFP is abnormally disconnected,Reconnect to last disconnected device
BIT[1]	0-disable echo cancellation, 1-enable echo cancellation
BIT[2]	0-HFP 3-way-calling function disable, 1-HFP 3-way-calling function enable

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 - Dial/Redial 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 number “075527924639”

<< AT+HFPDIAL=075527924639

>> OK

5.2.7 AT+HFPDTMF - Send DTMF code

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

Example:Send DTMF code “#” while talking

<< 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/Hung up Call

Command	AT+HFPCHUP
Description	Reject incoming call or hung up outgoing/active call

5.2.10 AT+HFPMCAL - Three way calling 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	refer to application note for more description: *HFP three way calling operations*

5.2.11 AT+HFPADTS - Transfer Voice Audio Between Local and Remote Device

Command	AT+HFPADTS=Param
`Param`	1: Transfer voice audio from module to remote device 2: Transfer voice audio from remote device to module
Description	Transfer voice audio between module and remote device by default if no parameter set

5.2.12 AT+HFPVR - Start/Stop Voice Recognition of Remote Device

Command	AT+HFPVR=Param
`Param`	0-Stop 1-Start
Description	Start/Stop Voice Recognition of Remote Device (such as Siri for iOS devices)

5.2.13 AT+HFPINFO - Read HFP information

Command	AT+HFPINFO
Description	Return the current HFP status, signal strength, battery, device name, etc.

5.2.14 AT+MICMUTE - Mute Mic

Command	AT+MICMUTE=Param
`Param`	0-unmute 1-mute
Description	mute mic when call active

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 information

Command	AT+A2DPINFO
Description	Return the current A2DP status, remote device name , etc.

5.3.5 AT+AVRCPSTAT - Read AVRCP State

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

5.3.6 AT+AVRCPCFG - Get/Set 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. default:1 second
`BIT[4]`	Browsing function enable/disable
`BIT[5]`	Auto pull media cover art image to specify folder

Example: Read AVRCP configuration

<< AT+AVRCPCFG

>> +AVRCPCFG=1

OK

Example: Get track play progress every 5 second

<< AT+AVRCPCFG=9

>> OK

5.3.7 AT+PLAYPAUSE - Track Play/Pause

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

5.3.8 AT+PLAY - Track Play

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

5.3.9 AT+PAUSE - Track Pause

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

5.3.10 AT+STOP - Track Stop

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

5.3.11 AT+FORWARD - Track Forward

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

5.3.12 AT+BACKWARD - Track Backward

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

5.3.13 AT+REPEAT - Set Media Player Repeat Mode

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

5.3.14 AT+SHUFFLE - Set Media Player Shuffle Mode

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

5.3.15 AT+GETMP - List Media Players of Remote Device

Command	**AT+GETMP**
Response	**+BROWDATA=Param1,Param2,Param3,Param4**
`Param`	Format description reference: *+BROWDATA - Media Player Filesystem Browsing Data*
Description	List media players of remote device, only player with browsable flag set support browsing. For some phones (e.g. iOS devices), user may need to launch the player on phone side at the first time refer to application note for more description: *AVRCP filesystem browsing*

5.3.16 AT+SETMP - Select Media Player

Command	**AT+SETMP=Param**
`Param`	Media Player index
Response	**+BROWDATA=Param1,Param2**
`Param`	Format description reference: *+BROWDATA - Media Player Filesystem Browsing Data*
Description	Select the media player to browse, player’s browsable flag must be set, we will enter the root directory after player selected refer to application note for more description: *AVRCP filesystem browsing*

5.3.17 AT+GETFD - List Sub Folders/Tracks of Selected Folder

Command	**AT+GETFD=Param1,Param2**
`Param1`	Start position, (1~65535)
`Param2`	End position, (1~65535), Param2 >= Param1
Description	List sub folders or media items in current folder. refer to application note for more description: *AVRCP filesystem browsing*

5.3.18 AT+SETFD - Select and Enter Folder

Command	**AT+SETFD=Param**
`Param`	（0):Enter up level folder (other): Enter selected folder
Description	Select and enter the folder to browse.

5.3.19 AT+GETNP - List Tracks in 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 Filesystem Browsing Data*

5.3.20 AT+ADDMP - Add Track to Media Player

Command	**AT+ADDMP=Param**
`Param`	Track ID
Description	Add selected track to media player and start to play.

5.4 PBAP Commands

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	Param1{, Param2{, Param3{, Param4}}}
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)
Param3	Phonebook format (defaut:0) (0) Family Name, Middle Name, Given Name (1) Given Name, Middle Name, Family Name (2) Raw vCard 2.1
Param4	Contact photo required (0/1)
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 downloading*

5.4.5 AT+PBABORT - Abort Downloading

Command	AT+PBABORT
Description	Abort downloading

5.5 SPP Commands

5.5.1 AT+SPPSTAT - Read SPP State

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

5.5.2 AT+SPPCONN - Establish SPP Connection

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

5.5.3 AT+SPPDISC - Release SPP Connection

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

5.5.4 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

5.6 GATT Commands

5.6.1 AT+GATTSTAT - Read GATT State

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

5.6.2 AT+GATTDISC - Release GATT Connection

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

5.6.3 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

5.7 HID Commands

5.7.1 AT+HIDSTAT - Read HID State

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

5.7.2 AT+HIDCONN - Establish HID Connection

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

5.7.3 AT+HIDDISC - Release HID Connection

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

5.7.4 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

5.7.5 AT+HIDDLY - Get/Set HID Report Period

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

5.7.6 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

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

>> AT+HIDSEND=1,A

<< OK

Example: Send key code ‘A’ 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

5.7.7 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

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 - Powering State

Format	**+PWRSTAT=Param**
`Param`	0-Powering off 1-Powering on(booting)
Description	AT Command is not recommended to be used while powering on/off state

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	Device Name for BR/EDR devices or advertising data for LE devices
Param6	Class of device(6 Bytes ASCII)
Format2	+SCAN=E: Scan stopped

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 - Pair Request

Format	**+PAIRREQ=Param1,Param2{,Param3}**
Param1	Passkey (000000~999999)
Param2	MAC address (12 Bytes ASCII) of current pairing device
Param3	Name of current pairing device

6.1.4 +PAIRED - Pair Result

Format	+PAIRED=Param1,Param2
Param1	Pair result (0)-Success (1~255)-Failed reason
Param2	MAC address (12 Bytes ASCII) of current pairing device

6.1.5 +CODEC - Codec ID

Format	+CODEC=Param
Param	Code id (1) NAU88L25B (2) TI TLV32AIC3204 (3) ES8388
Description	Firmware integrated I2C drivers of several codecs, such as NAU88L25B/ TLV32AIC3204/ ES8388, and probe one of them on booting。 BT1036, BT955, BT936 chips have built-in Codec, and do not report Codec instructions

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	Call number, only present for state > 3
Param3	Call number(Three-way calling)

Example: Dial number 10086

<< AT+HFPDIAL=10086

>> +HFPSTAT=3

>> +HFPSTAT=4,10086

>> +HFPAUDIO=1

Example: Incoming call with number 13265463800

>> +HFPSTAT=5, 13265463800

>> +HFPAUDIO=1

6.2.2 +HFPDEV - HFP Remote Device Information

Format	+HFPDEV=Param1{,Param2}
Param1	(12 Bytes ASCII), Remote MAC address of current HFP connection
Param2	(UTF8), Remote device name of current HFP connection

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	(0/1) In-band-ring support
Description	Report whether the current connected phone support in-band-ring

6.2.11 +HFPRING - HFP Remote Device Ringing

Format	+HFPRING=Param
Param	(0/1) In-band-ring off/on
Description	Phone is ringing when call incoming, the host platform should play a local ringtone if in-band-ring not supported by remote mobile phone

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 second
Param3	(Decimal ASCII),Total time of current track in second

Example: Read media player play progress every 1s

>> +TRACKSTAT=1,54,322

>> +TRACKSTAT=1,55,322

>> +TRACKSTAT=1,56,322

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 State

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

6.3.9 +BROWDATA - Media Player Filesystem Browsing Data

Format	+BROWDATA=Param1, Param2 {, Param3{, Param4}}
Param1	Browsing type, for each type, the following data means:
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	refer to application note for more description: *AVRCP filesystem browsing*

6.3.10 +BIPSTAT - BIP State

Format	+BIPSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Downloading
Description	BIP Profile only used for media player cover art image downloading now, refer to application note for more description: *AVRCP Cover Art image retrieval*

6.3.11 +COVERART - Media Track Cover Art Download Success

Format	+COVERART=Param
Param	Image ID
Description	Cover art image should be placed in specify folder with name ImageID.jpg, refer to application note for more description: *AVRCP Cover Art image retrieval*

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
Param4-2	Contact photo download compete flag if current download type is Phonebook, otherwise this parameter will not exist
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

Events for AAP (Android Auto Protocol) are almost the same with SPP, which are:

- +AAPSTAT, +AAPDATA for AAP profile

Document will omit these events.

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

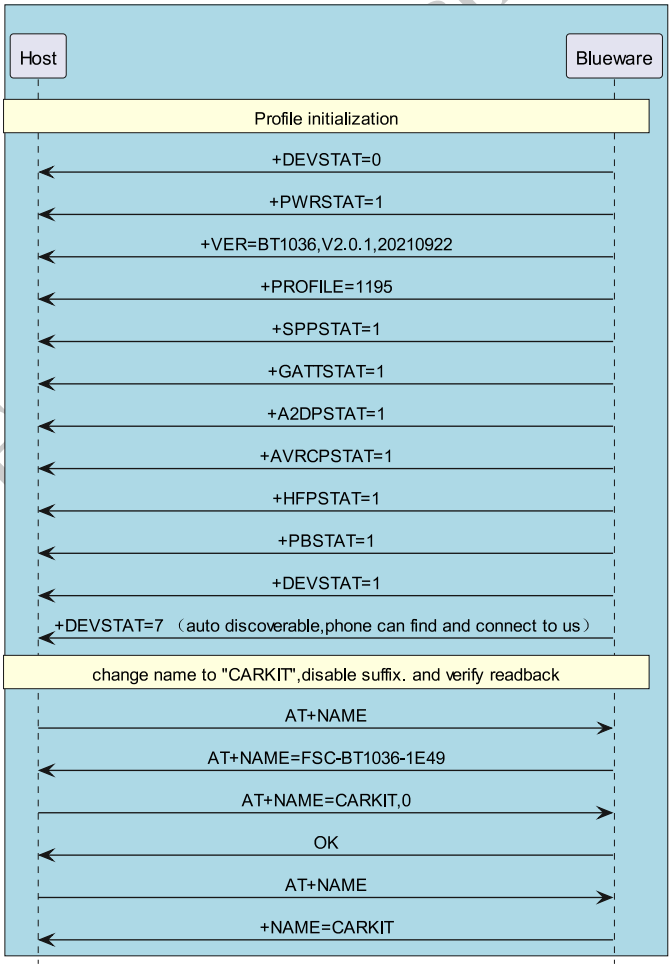
Format	+HIDSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected

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
                }
            }
        }
    }
}
```

Note

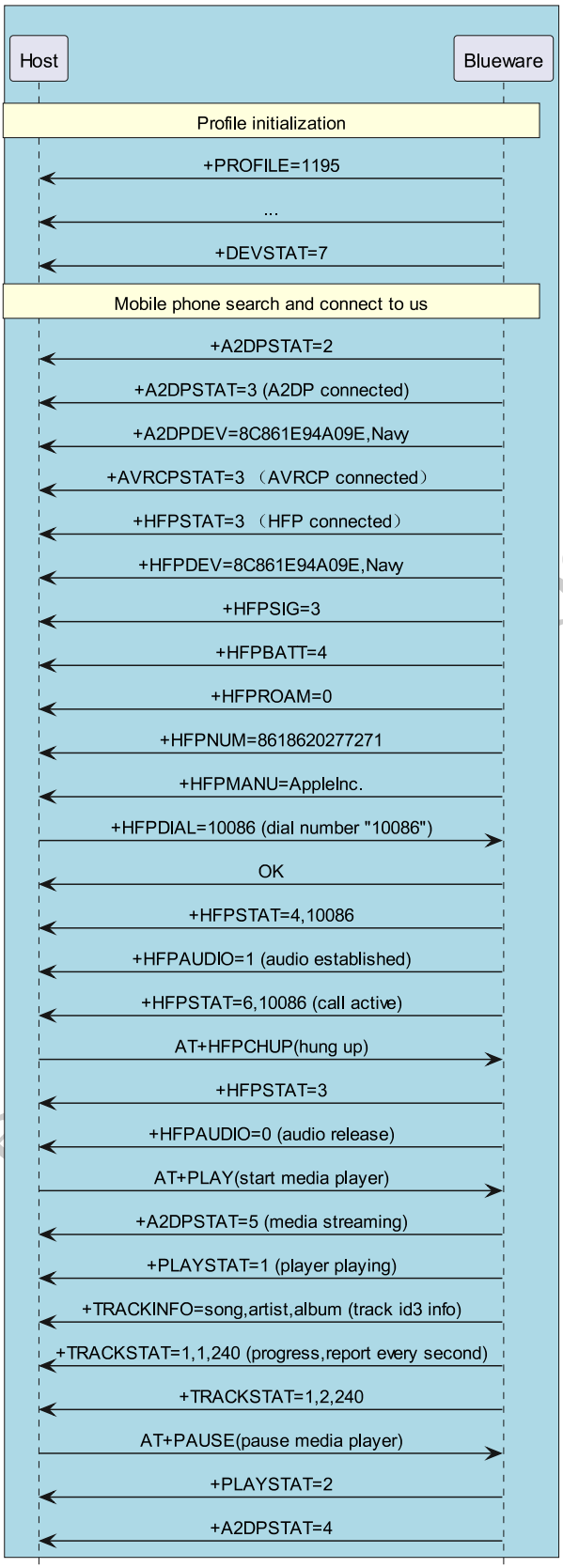
modify any parameters, it is recommended to query first and then modify the final verification

7.2 Sink mode connection

Note

If the factory firmware is an integrated transceiver program, the program default pro-

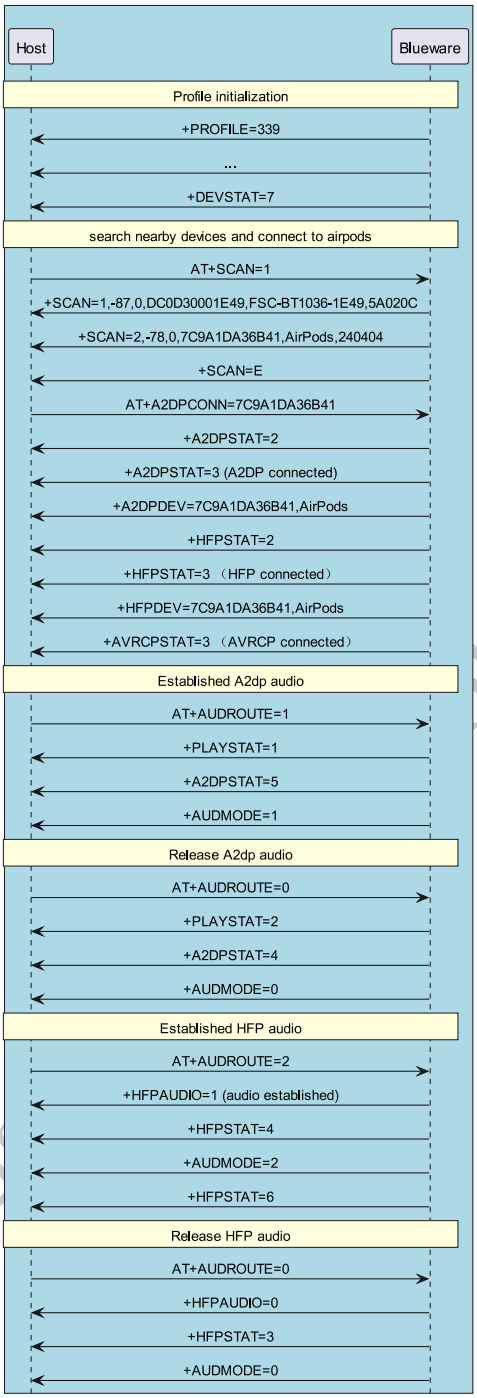
file=339, Need to send AT+PRFOILE=1195 to configure audio receiving(sink) mode (Enable SPP, GATT Server, HFP Sink, A2DP Sink, AVRCP-Controller, PBAP). Some module transceiver programs do not support PBAP, such as BT955 module



7.3 Source mode connection

Note

The transmission(source) mode connection needs to configure the module to A2DP Source, HFP Source, The program will not automatically enter the audio transmission mode or the call (intercom) mode after connecting the headset and speaker by default, you need to send the command: Start audio transmission (AT+AUDROUTE=1) Start HFP (AT+AUDROUTE=2)



MCU connects to 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)

```

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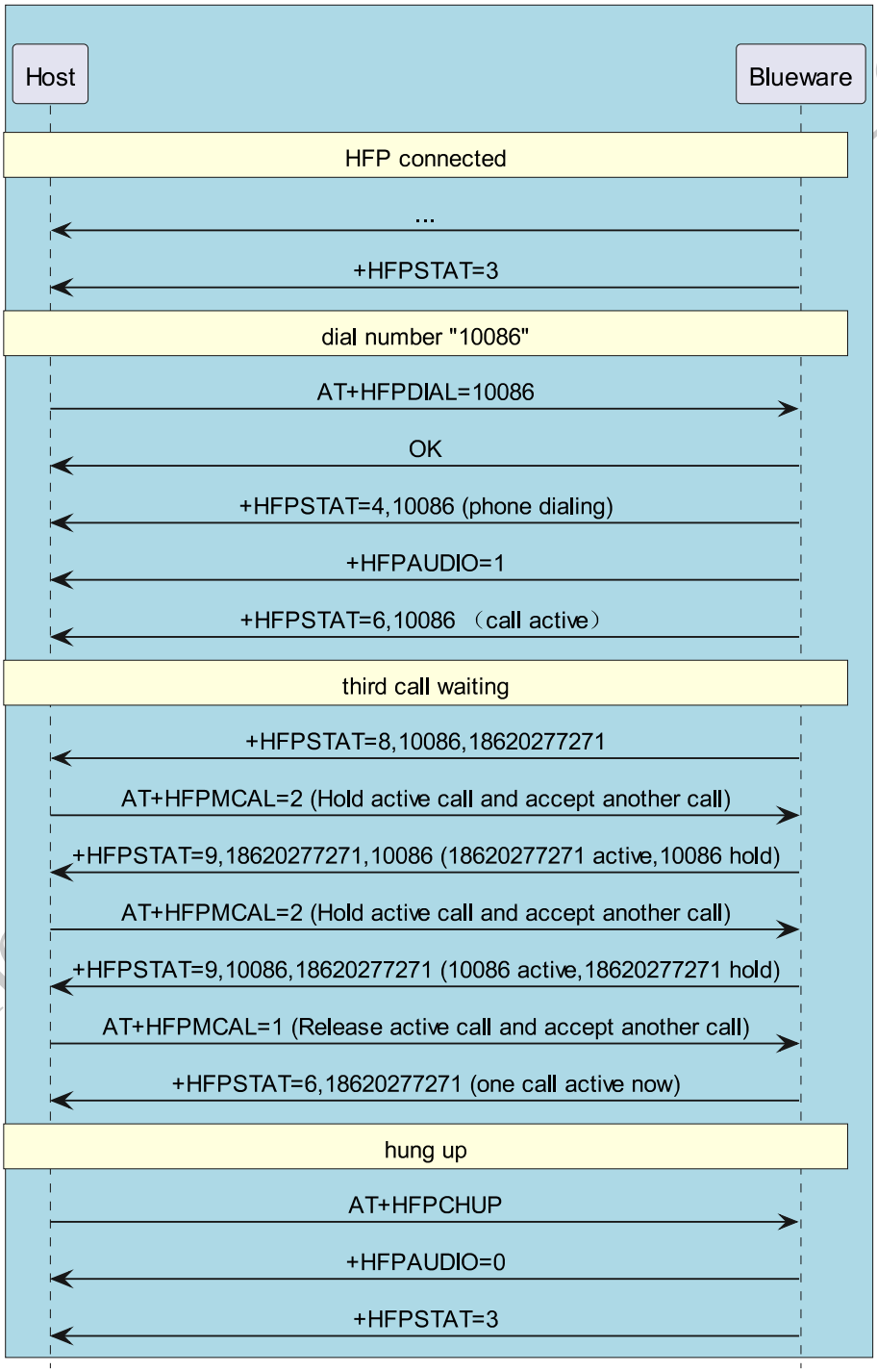
```
void bt_connect(void)
{
    //enable hfp source,a2dp source,avrcp tg,spp,gatt
    uart_send("AT+PROFILE=339\r\n"); //if profile changes,module will auto reboot,
    wait_ms(500);
    uart_send("AT+PROFILE\r\n");
    uint32 profiles = uart_read("+PROFILE",profiles);
    if(profiles & (PROFILE_A2DP_SOURCE|PROFILE_HFP_AG))
    {
        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 calling operations

Note

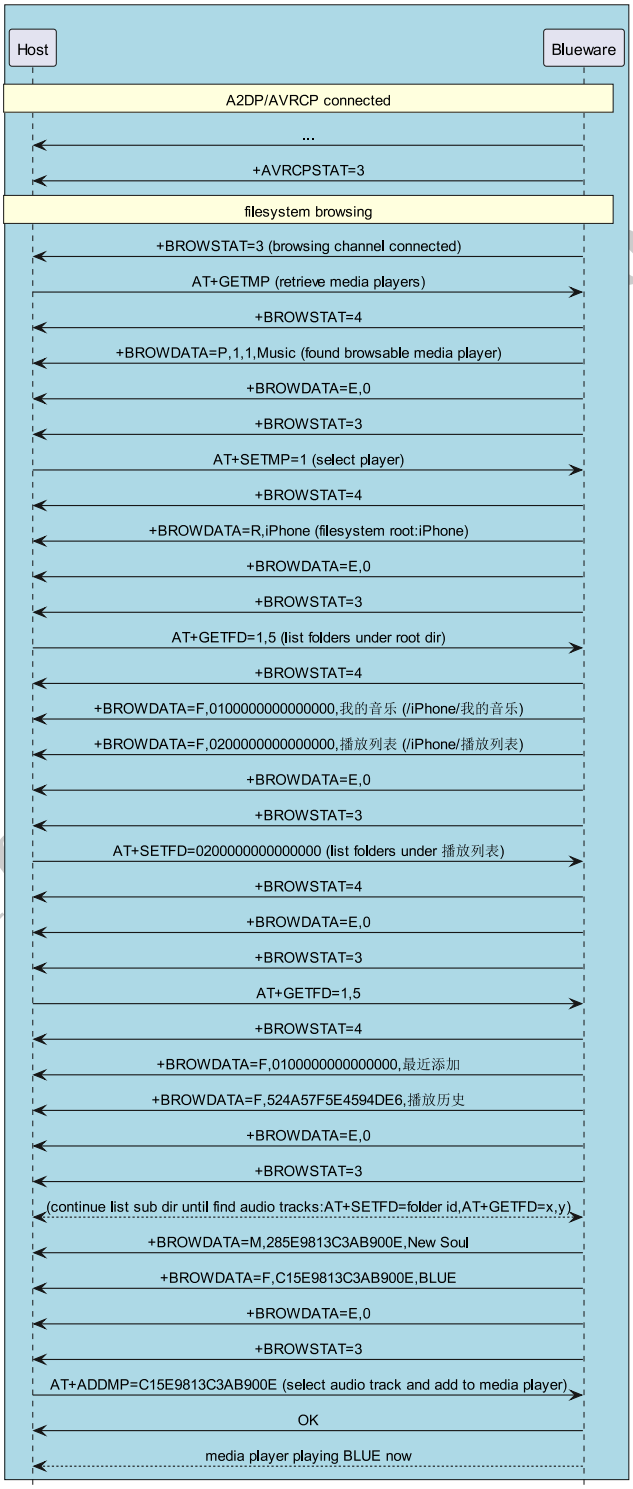
BT1036, BT955 and other modules have not enabled the three way calling function. If you need to test this function, please contact Feasycom



7.5 AVRCP filesystem browsing

Note

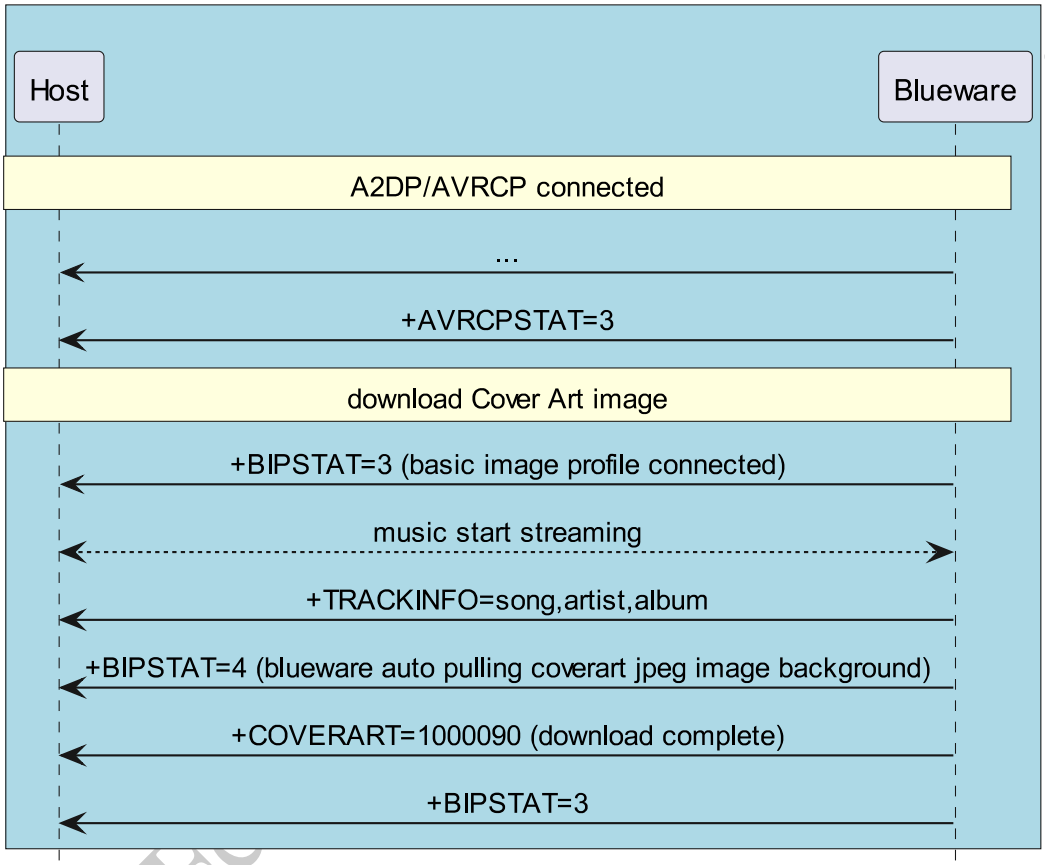
BT1036, BT955 and other modules have not enabled the three way calling function. If you need to test this function, please contact Feasycom



7.6 AVRCP Cover Art image retrieval

Note

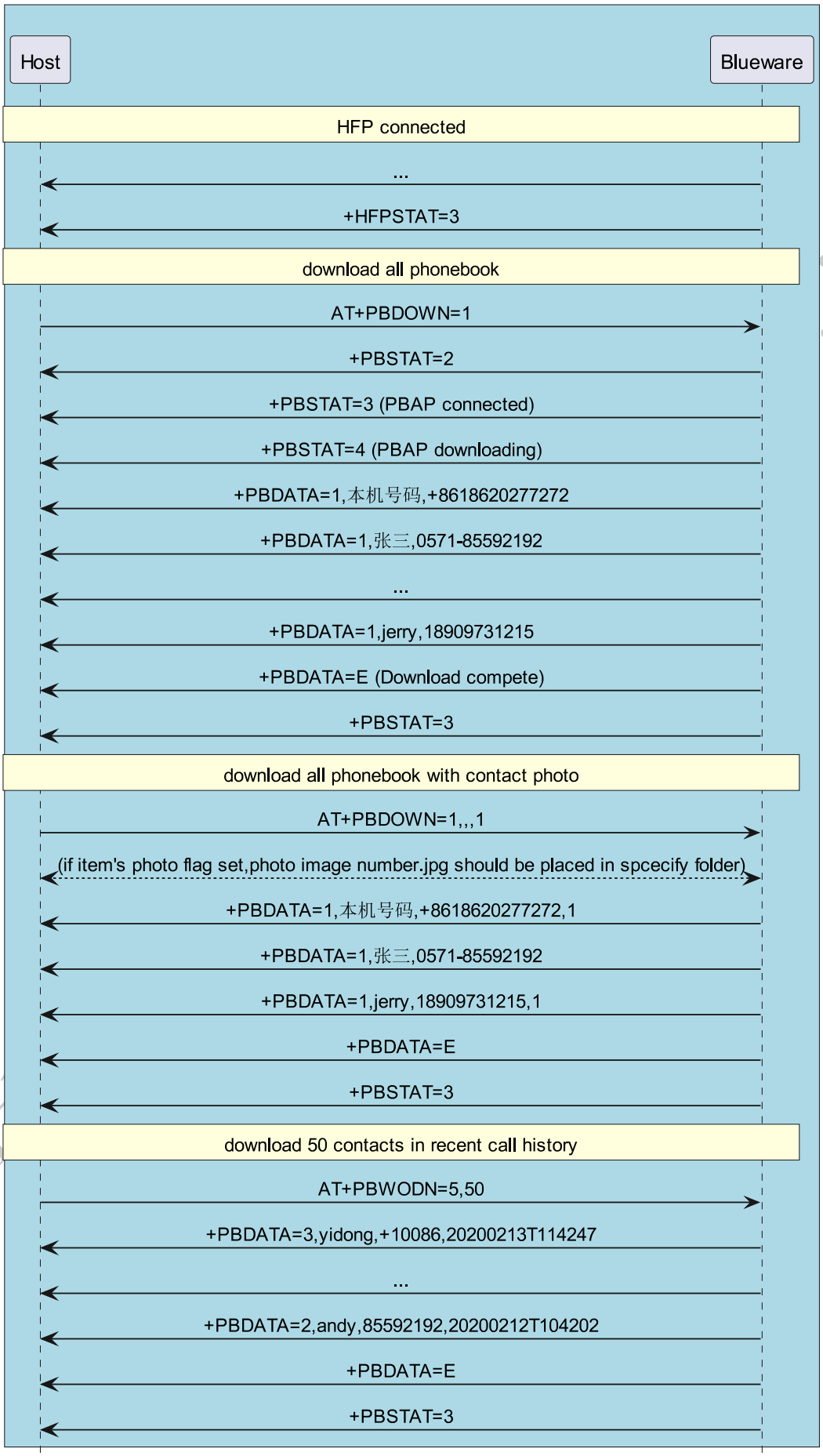
Cover Art image download is only supported by the car protocol stack module, not supported by the SOC audio module



7.7 Phonebook/Contact photo downloading

Note

Contact photo download is only supported by the car protocol stack module, not supported by the SOC audio module When some firmware does not support downloading, it will automatically connect to PBAP, and you need to send AT+PBCONN to connect to PBAP before downloading


Host
Blueware
HFP connected
...
+HFPSTAT=3
download all phonebook
AT+PBDOWN=1
+PBSTAT=2
+PBSTAT=3 (PBAP connected)
+PBSTAT=4 (PBAP downloading)
+PBDATA=1,本机号码,+8618620277272
+PBDATA=1,张三,0571-85592192
...
+PBDATA=1,jerry,18909731215
+PBDATA=E (Download compete)
+PBSTAT=3
download all phonebook with contact photo
AT+PBDOWN=1,,,1
(if item's photo flag set,photo image number.jpg should be placed in spcecify folder)
+PBDATA=1,本机号码,+8618620277272,1
+PBDATA=1,张三,0571-85592192
+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

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