FSC-BT80X

Sink Programming User Guide

Version 3.6

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Revision History

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1.0	2015/10/10	First Release	Tony
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1. Introduction

This specification presents design guidelines for software engineers that use FSC-BT80X series modules for Bluetooth requirements.

1.1 Terms

Throughout this specification:

- { } : Content between {...} is optional
- << : Content behind << represents a *COMMAND* sent from Host to Module
- >> : Content behind >> represents a *RESPONSE* sent from Module to Host

1.2 Hardware Interface

- GPIO
- PWM
- UART
- I2C Master/Slave
- I2S Master/Slave
- Analog Input/Output

1.3 Supported Bluetooth Profile

- SPP (Serial Port Profile)
- GATT Server (Generic Attribute Profile)
- GATT Client (Generic Attribute Profile)
- HFP Sink (Hands-Free 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 Keyboard (Human Interface Profile)
- PBAP Server (Phonebook Access Profile)

1.4 Command Format

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

- All commands start with “AT”, end with <CR><LF>

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- <CR> stands for "carriage return", corresponding hex is 0x0D
- <LF> stands for "line feed", corresponding hex is 0x0A
- If command has parameter, parameter keep behind "="
- If command has multiple parameters, parameter must be separated by ","
- If command has response, response start with <CR><LF>, end with <CR><LF>
- Module will always report command's execution result using "OK" for success or "ERROR" for failure

e.g.

1. Read module's BR/EDR local name
   << *AT+NAME*
   >> *+NAME=Feasycom*
   >> *OK*

2. Pick up an incoming call when no call incoming actually
   << *AT+HFPANSW*
   >> *ERROR*

1.5 Indication Format

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

- All indications start with <CR><LF>, end with <CR><LF>
- If indication has parameter, parameter keep behind "="
- If indication has multiple parameters, parameter must be separated by ","
- Hex value <FF> will be used instead of "," in some special indications

e.g.

1. Received "1234567890" from mobile phone via SPP profile
   >> *+SPPDATA=10,1234567890*
2. Call number "10086" use a mobile phone when HFP connected
   >> *+HFPSTAT=4*
   +HFPCID=10086
   +HFPCIE=China Mobile
   +HFPAUDIO=1
   +HFPSTAT=6

1.6 Module Default Settings

Local Name (BR/EDR)	FSC-BT80X
Local Name (LE)	FSC-BT80X-LE
Pin Code	0000
Secure Simple Pairing Mode	On
Physical UART Baudrate	115200bps/8/N/1

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2.Command Table

2.1 General Commands

2.1.1 AT Command Test

Format: AT
Response: OK
Description: Test the communication between HOST and Module after power on, UART baudrate changed and etc.
Example: AT command test << *AT* >> *OK*

2.1.2 Bluetooth Profile Selection *<auto reboot>*

Format: AT+PROFILE{=Param} Param: A base-10 representation of a bit field, default:1195, 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 Sink (Hands-Free Profile) BIT[4] HFP Source (Hands-Free Profile) 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)
Response: +PROFILE=Param
Description: BT80X supports SPP, GATT Server, GATT Client, HFP Sink, A2DP Sink, A2DP Source, AVRCP Controller, HID Keyboard, PBAP Server

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The default program does not support GATT Client and HID Keyboard.
Example: Read current profile selection >> AT+PROFILE << +PROFILE=171 << OK **Example**: Only Enable A2DP SINK,AVRCP Controller, >> AT+PROFILE=160 << OK **Example**: Enable A2DP Source, Spp, GATT Server >> AT+PROFILE=67 << OK

2.1.3 Read Firmware Version

Format: AT+VER
Response: +VER=Param Param: Firmware version (24 Bytes ASCII)
Example: Read module's firmware version << *AT+VER* >> *+VER=FSC-BT80X,V1.0.0,20160120* >> *OK*

2.1.4 Read BR/EDR MAC Address

Format: AT+ADDR
Response: +ADDR=Param Param: Module's BR/EDR MAC address (12 Bytes ASCII)
Example: Read Module's BR/EDR MAC address << *AT+ADDR* >> *+ADDR=DC0D30123456* >> *OK*

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2.1.5 Read BLE MAC Address

Format: AT+LEADDR
Response: +LEADDR=Param Param: Module's LE MAC address (12 Bytes ASCII)

2.1.6 Read/Write BR/EDR Local Name

Format: AT+NAME {=Param1{, Param2}} Param1: BR/EDR local name (1~31 Bytes ASCII, default: FSC-BT80X) Param2: MAC address suffix (0/1, default:0) (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 existence, otherwise read current local name
Example: Read current BR/EDR local name << *AT+NAME* >> *+NAME=Feasycom* >> *OK* **Example**: Change module's BR/EDR local name to "ABC" << *AT+NAME=ABC* >> *OK* **Example**: Change module's BR/EDR local name to "ABC" and enable suffix << *AT+NAME=ABC,1* >> *OK*

2.1.7 Read/Write BLE Local Name

Format: AT+LENAME {=Param1{, Param2}} Param1: BLE local name (1~25 Bytes ASCII, default: FSC-BT80X-LE) Param2: MAC address suffix (0/1, default:0) (0) Disable suffix

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(1) Enable suffix “-XXXX” (lower 4 bytes of MAC address) after local name
Response: +LENAME=Param

2.1.8 Read/Write BLE Random Addr Configuation

Format: AT+LECFG {=Param} Param1: BLE Random addr enable(0/1, default:1) (0) Disable (1) Enable
Response: +LECFG=Param

2.1.9 Read/Write UART Baudrate

Format: AT+BAUD{=Param} Param: Baudrate (9600/19200/38400/57600/115200/230400/460800 /921600, default:115200)
Response: +BAUD=Param
Description: Module’s baudrate will be changed immediately after received this command

2.1.10 Read/Write Pin Code

Format: AT+PIN{=Param} Param: Pin code (4~15 Bytes ASCII, default:0000)
Response: +PIN=Param
Example: Read module’s pin code **<<** *AT+PIN* **>>** *+PIN=0000* **>>** *OK* **Example**: Change module’s pin code to “12345678”

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<< AT+PIN=12345678 *>> OK*

2.1.11 Turn On/Off Secure Simple Pairing *<need reboot>*

Format: AT+SSP{=Param} Param: Simple pairing (0/1, default:1) (0) Turn off (1) Turn on
Response: +SSP=Param
Description: Pin code input will be bypassed if simple pairing is on in pairing procedure

2.1.12 Read/Write Class Of Device *<need reboot>*

Format: AT+COD{=Param} Param: Class of device (6 bytes ASCII, default:240404 Handsfree device)
Response: +COD=Param

2.1.13 Read/Clear Paired Record

Format: 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} Param1: (1~8) Paired device's index Param2: (MAC) Paired device's MAC address Param3: (UTF8) Paired device's name **Response2**: +PLIST=E: End of the paired record
Example: Read module's paired record

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<< AT+PLIST *>> +PLIST=1,1C5CF226D773, iPhone* *+PLIST=2, A0BC30075421, Samsung S8* *+PLIST=E* *>> OK* **Example**: Clear module's paired record *<< AT+PLIST=0* *>> OK*

2.1.14 Turn On/Off Throughput Mode*<need reboot>*

Format: 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
Example: Read current throughput mode *<< AT+TPMODE* *>> +TPMODE=1* *>> OK* **Example:** Turn off throughput mode *<< AT+TPMODE=0* *>> OK*

2.1.15 Read Module States

Format: AT+STAT
Response: +STAT=Param1, Param2, Param3, Param4, Param5, Param6, Param7, Param8 Param1: DEVSTAT Param2: SPPSTAT Param3: GATTSTAT

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Param4: HFPSTAT Param5: A2DPSTAT Param6: AVRCPSTAT Param7: HIDSTAT Param8: PBSTAT
Description: Refer to chapter 3 for state description, state may have different meanings according to profile selection

2.1.16 Turn On/Off Power On Auto Reconnect *<need reboot>*

Format: AT+AUTOCONN{=Param} Param: Option (0~15, default:3) (0) Turn Off (1-15) Turn on and reconnect times
Response: +AUTOCONN=Param
Description: Module will attempt to connect last device after power on if set

2.1.17 Scan Nearby Devices

Format: AT+SCAN {=Param} Param1:(0~1) (0) Stop scan (1) Scan nearby BR/EDR devices
Description: Refer to Chapter 3 for format description of scan result

2.1.18 Turn On/Off Auto Link*<a2dp source only>*

Format: AT+AUTOLINK{=Param} Param: Option (0/1, default:0) (0) Turn Off (1) Turn on

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Response: + AUTOLINK =Param
Description: if set, Module will scan nearby devices for 5.12 seconds, find the one which has best signal strength, then connect to it automatically. Module is not connected, it will always scan nearby devices

2.1.19 Speaker Volume Setting

Format: AT+SPKVOL{=Param} Param: ('+'/'-')
Response: +SPKVOL =Param
Example: Read current speaker volume << *AT+SPKVOL* >> *+SPKVOL=14* **Example**: Increase audio speaker volume << *AT+SPKVOL=+* >> *OK*

2.1.20 Microphone Gain Setting *<a2dp source only>*

Format: AT+MICGAIN{=Param} Param: Microphone input gain ('+'/'-')
Response: + MICGAIN=Param

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2.1.21 I2S/PCM Format Configuration *<need reboot>*

Format: +I2SCFG{=Param}
Param: A base-10 representation of a bit field, default:0, for each bit:

BIT[0]	0: Disable I2S/PCM for audio input/output
	1: Enable I2S/PCM for audio input/output
BIT[1]	0: I2S/PCM master role
	1: I2S/PCM slave role
BIT[2]	0: 48000Hz sample rate
	1: 44100Hz sample rate
BIT[3-4]	00: I2S Philips standard format
BIT[5-6]	00: 16-bit resolution
	01: 24-bit resolution
	10: 32-bit resolution

Example: Read current I2S/PCM configuration
<< AT+I2SCFG
>> +I2SCFG=0
Example: Set I2S/PCM configuration to: I2S master, 32-bit resolution,48kHz.
I2S LRCLK: 48000Hz
I2S BCLK: 3.072MHz (48000Hz * 32bit * 2Stereo)
<< AT+I2SCFG=65
>> OK

2.1.22 SPDIF Format Configuration *<need reboot>*

Format: +SPDIFCFG{=Param}
Param: A base-10 representation of a bit field, default:0, for each bit:

BIT[0]	0: Disable SPDIF for audio output
	1: Enable SPDIF for audio output

Example: Read current SPDIF configuration
<< AT+SPDIFCFG
>> +SPDIFCFG=0

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2.1.23 Release All Connections

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

2.1.24 Soft Reboot

Format: AT+REBOOT
Description: Module release all Bluetooth connections with remote device then reboot

2.1.25 Restore Factory Settings

Format: AT+RESTORE
Description: Module restore all factory settings then reboot

2.1.26 Turn On/Off Dual Stream Configuration(a2dp source only)

Format: AT+DUALCFG{=Param} Param: Dual Stream Configuration(0/1, default:1) (0) Turn Off (1) Turn On
Response: +DUALCFG=Param
Description: When Dual Stream is enabled, support connect two a2dp sink,
Example: Read current Dual Stream Configuration << *AT+DUALCFG* >> *+ DUALCFG =1* **Example:** Turn off Dual Stream Configuration << *AT+DUALCFG=0* >> *OK*

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2.1.27 Enable Module

Format: AT+BTEN {=Param} Param: (0~1) (0) Enter Pairing Mode (1) Quit Pairing Mode
Description: Disconnect all device connected and put module enter unconnectable and undiscoverable state .Always effective even reboot.

2.1.28 Enter Pairing Mode

Format: AT+PAIR{=Param} Param: (0~1) (0) Quit Pairing Mode (1) Enter Pairing Mode
Description: put module enter or quit connectable and discoverable state.

2.1.29 Enable Print Log

Format: AT+PRINT{=Param} Param: (0~1) (0) Disable (1) Enable
Description: Enable module print the log(including states of profiles) to uart.

2.1.30 Audio Active PIO Delay Time Configuration

Format: AT+MUTEDELAY{=Param} Param: (0~60) Delay time = (Param * 50)ms
Description: The param is used to eliminate the “popo” noise when the audio just established.

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2.1.31 LineIn Configuration

Format: AT+LINECFG{=Param} Param: (0~1) (0) Disable LineIn (1) Enable LineIn
Description: Bluetooth input source from linein

2.2 HFP Commands

2.2.1 Read HFP State

Format: AT+HFPSTAT
Response: +HFPSTAT=Param Param: Refer to Chapter 3 for state description

2.2.2 Establish HFP Connection

Format: AT+HFPCONN{=Param} Param: MAC address of target device (12 Bytes ASCII)
Description: Module will reconnect to last HFP device if parameter not exist
Example: Connect to last HFP device << *AT+HFPCONN* >> *OK* **Example2**: Connect to specific HFP device with MAC address << *AT+HFPCONN=1C5CF226D773* >> *OK*

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2.2.3 Release HFP Connection

Format: AT+HFPDISC
Description: Release current HFP connection with remote device

2.2.4 Dial/Redial Phone Number

Format: AT+HFPDIAL{=Param} Param: Phone number (1~25 Bytes ASCII)
Description: Dial specific number if parameter existence, otherwise redial
Example: Redial << *AT+HFPDIAL* >> *OK* **Example:** Dial number "075527924639" << *AT+HFPDIAL=075527924639* >> *OK*

2.2.5 Send DTMF code

Format: AT+HFPDTMF=Param Param: DTMF code (0~9/#/*)
Example: Send DTMF code "#" while talking << *AT+HFPDTMF=#* >> *OK*

2.2.6 Pick Up Incoming Call

Format: AT+HFPANSW
Description: Pick up an incoming call

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2.2.7 Reject/Hung up Call

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

2.2.8 Transfer Voice Audio

Format: AT+HFPADTS{=Param} Param: Transfer direction (0/1) (0) Transfer voice audio from module to remote device (1) Transfer voice audio from remote device to module
Description: Transfer voice audio between module and remote device by default if no parameter existence

2.2.9 Mute Mic

Format: AT+MUTEMIC{=Param} Param: mute mic(0/1) (0) unmute (1) mute
Description: mute mic when call active

2.3.0 Start/Stop Voice Recognition of Remote Device

Format: AT+HFPVR=Param Param: On/off (0/1) (0) Stop (1) Start
Description: Start/Stop Voice Recognition of Remote Device (such as Siri for iOS devices)

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2.3 A2DP/AVRCP Commands

2.3.1 Read A2DP State

Format: AT+A2DPSTAT
Response: +A2DPSTAT=Param Param: Refer to Chapter 3 for state description

2.3.2 Establish A2DP Connection

Format: AT+A2DPCONN{=Param} Param: MAC address of target device (12 Bytes ASCII)
Description: Module will reconnect to last A2DP device if no parameter exist
Example: Connect to last A2DP device << *AT+A2DPCONN* >> *OK* **Example2**: Connect to specific A2DP device with MAC address << *AT+A2DPCONN=1C5CF226D773* >> *OK*

2.3.3 Release A2DP Connection

Format: AT+A2DPDISC
Description: Release current A2DP connection with remote device

2.3.4 Read A2DP Decoder

Format: AT+A2DPDEC
Response: +A2DPDEC=Param

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Param:(0~8) (0) INVALID (1) SBC (2) MP3 (3) AAC (4) FASTSTREAM (5) APTX (6) APTX-Sprint (7) APTX-HD (8) APTX-LL
Description: Default support SBC、AAC 、APTX 、APTX-HD 、APTX-LL

2.3.5 Read A2DP Encoder

Format: AT+A2DPENC
Response: +A2DPENC=Param Param:(0~8) (0) INVALID (1) SBC (2) MP3 (3) AAC (4) FASTSTREAM (5) APTX (6) APTX-Sprint (7) APTX-HD (8) APTX-LL
Description: Default support SBC 、APTX 、APTX-LL

2.3.6 Read/Write AVRCP Configuration

Format: AT+AVRCPCFG{=Param} Param: A base-10 representation of a bit field, default:9, for each bit: BIT[0] Auto get track ID3 information (title, artist, album) on track changed.default:1 BIT[1-3] Auto get track state (play progress) if value > 0. default:5(second)

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Example: Read AVRCP configuration << *AT+ AVRCPCFG* >> *+ AVRCPCFG =9* *OK* **Example**: Get track play progress every 1 second << *AT+ AVRCPCFG =3* >> *OK*
Description: Refer to Chapter 3 for indication format of track information and track state

2.3.7 Track Play/Pause

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

2.3.8 Track Play

Format: AT+PLAY
Description: Send play command to remote media player

2.3.9 Track Pause

Format: AT+PAUSE
Description: Send pause command to remote media player

2.3.10 Track Stop

Format: AT+STOP
Description: Send stop command to remote media player

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2.3.11 Track Forward

Format: AT+FORWARD
Description: Send forward command to remote media player

2.3.12 Track Backward

Format: AT+BACKWARD
Description: Send backward command to remote media player

2.3.13 Track FastForward

Format: AT+FFDW=Param Param: (0/1) (0) Fast Forward Release (1) Fast Forward Press
Description: Send fast forward command to remote media player

2.3.14 Track Rewind

Format: AT+RWD=Param Param: (0/1) (0) Rewind Release (1) Rewind Press
Description: Send rewind command to remote media player

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2.4 Phonebook Access Commands

2.4.1 Download Phonebook

Format: 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)
Response: +PBDATA=Param1<FF>Param2<FF>Param3 {<FF>Param4} Param: Refer to Chapter 3 for format description of received phonebook data

2.5 Bluetooth Serial Commands (BR/EDR SPP)

2.5.1 Read SPP State

Format: AT+SPPSTAT
Response: +SPPSTAT=Param Param: Refer to Chapter 3 for state description

2.5.2 Establish SPP Connection

Format: AT+SPPCONN=Param Param: MAC address of target device (12 Bytes ASCII)
Description: If target device is mobile phone, mobile phone must have initialized a RFCOMM service before this

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2.5.3 Release SPP Connection

Format: AT+SPPDISC
Description: Release current SPP connection with remote device

2.5.4 Send Data Via SPP

Format: AT+SPPSEND=Param1, Param2 Param1: Payload length (1~236) Param2: Payload (1~236Bytes 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*

2.6 Bluetooth Serial Commands (LE GATT)

2.6.1 Read GATT State

Format: AT+GATTSTAT
Response: +GATTSTAT=Param Param: Refer to Chapter 3 for state description

2.6.2 Release GATT Connection

Format: AT+GATTDISC
Description: Release current GATT connection with remote device

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2.6.3 Send Data Via GATT

Format: AT+GATTSEND=Param1, Param2 Param1: Payload length (1~100) Param2: Payload (1~100 Bytes UTF8)
Description: If throughput mode is on, this command is de-active
Example: Send data "1234567890" to remote device via GATT << *AT+GATTSEND=10,1234567890* >> *OK*

3. Indication Table

3.1 General Indications

3.1.1 Device State

Format: +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 Non Discoverable; 1: BR/EDR Discoverable BIT[2] 0: BLE Non Advertising; 1: BLE Advertising BIT[3] 0: BR/EDR Non Scanning; 1: BR/EDR Scanning BIT[4] 0: BLE Non Scanning; 1: BLE Scanning
Example: Module is power on, discoverable and advertising **>>** *+DEVSTAT=7*

3.1.2 Scan Result

Format: +SCAN =Param1, Param2, Param3, Param4, Param5, Param6 Param1: Index (1~8) Param2: Device address type (0~2) (0)LE public address

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(1)LE random address
(2)BR/EDR address
Param3: MAC address (12 Bytes ASCII)
Param4: RSSI (-255 ~ 0)
Param5: Size of Param6 if exist
Param6: Device Name for BR/EDR devices or advertising data for LE devices

Description: Param5/Param6 may not exist if remote device out of distance

Example: Scan BR/EDR nearby devices in 6.4s
<< *AT+SCAN=1,5*
>> *OK*
+SCAN=1,2, DC0D30000003, -32,8, Feasycom
+SCAN=2,2, DC0D30000044, -64,8, Feasycom_1234
+SCAN=3,2, DC0D30000097, -47,8, TESTHID

3.1.3 Paired Success

Format: +PAIRED=Param
Param: MAC address (12 Bytes ASCII) of current paired device

3.2 HFP Indications

3.2.1 HFP State

Format: +HFPSTAT=Param
Param:(0~6)
(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected
(4) Outgoing call
(5) Incoming call
(6) Active call

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3.2.2 HFP Device Information

Format: +HFPDEV=Param1,Param2 Param1: (12 Bytes ASCII), Remote device's MAC address of current HFP connection Param2: (UTF8), Remote device's name of current HFP connection
Example: HFP connect success with device **>>** *+HFPDEV=1C5CF226D774,iPhone*

3.2.3 Incoming/Outgoing Call Number

Format: +HFPCID=Param Param:(1~25 Bytes ASCII), Call number
Example: Dial number 10086 **<<** *AT+HFPDIAL=10086* **>>** *+HFPSTAT=4* *+HFPCID=10086* *+HFPCIE=China Mobile* *+HFPAUDIO=1* **Example**: Incoming call with number 13265463800 **>>** *+HFPSTAT=5* *+HFPCID=13265463800* *+HFPCIE=Jerry* *+HFPAUDIO=1*

3.2.4 Incoming/Outgoing Call Name

Format: +HFPCIE=Param Param:(UTF8), Call name
Description: Not every mobile phone support this indication

3.2.5 HFP Voice Audio State

Format: +HFPAUDIO=Param

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Param:(0/1)

(0) HFP voice audio disconnected, audio input/output routed to remote device

(1) HFP voice audio connected, audio input/output routed to module

3.2.6 HFP Device Network Signal Strength

Format: +HFPSIG=Param

Param:(0~5) Network signal strength of remote device

3.2.7 HFP Device Network Operator Selection

Format: +HFPNET=Param

Param:(UTF8) Network operator selection of remote device

3.2.8 HFP Device Roaming State

Format: +HFPROAM=Param

Param:(0/1) Roaming state of remote device

3.2.9 HFP Device Battery Level

Format: +HFPBATT=Param

Param:(0~5) Battery level of remote device

3.3 A2DP/AVRCP Indications

3.3.1 A2DP State

Format: +A2DPSTAT=Param

Param:(0~4)

(0) Unsupported

(1) Standby

(2) Connecting

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(3) Connected
(4) Streaming

3.3.2 A2DP 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

Example: A2DP connect success with device
>> *+A2DPDEV=1C5CF226D774,iPhone*

3.3.3 AVRCP State

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

3.3.4 Media Player State

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

3.3.5 Media Player Play Progress

Format: +TRACKSTAT=Param1, Param2, Param3
Param1:(0~4), Media Player State

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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 3s
<< *AT+AVRCPCFG=7*
>> *+TRACKSTAT=1,142000,248000*
+TRACKSTAT=1,145000,248000
+TRACKSTAT=1,148000,248000

3.3.6 Media Track Information

Format: +TRACKINFO=Param1 <FF> Param2 <FF> Param3
Param1: title
Param2: artist
Param3: ablum

Example: Phone playing song "Creep-Radio Head"
>> *+TRACKINFO=Creep <FF> Radiohead <FF> Pablo Honey*

3.4 Phonebook Access Indications

3.4.1 PBAPC State

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

3.4.2 PB Entries Of Remote Devices

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

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3.4.3 Received Phonebook Data

Format1: +PBDATA=Param1 <FF> Param2 xFF \xParam3 {xFF Param4}
Param1: Type
(0) Phonebook (SIM Storage)
(1) Phonebook (Phone Storage)
(2) Received call log
(3) Dialed call log
(4) Missed call log
Param2: (UTF8), Name
Param3: (ASCII), Number
Param4: (15 Bytes ASCII), Call time
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 <FF> Jack <FF> 18219146201
+PBDATA=1 <FF> kenan <FF> 8613771972680
……
+PBDATA=E
Example: Download 10 dialed call log
<< *AT+PBDOWN=3,10*
>> *+PBDATA=3 <FF> China Mobile <FF> 10086 <FF> 20171013T103516*
+PBDATA=3 <FF> Jerry <FF> 18688967507 <FF> 20171012T152826
……
+PBDATA=E

Description: See MSC example in 4.3

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3.5 Bluetooth Serial Indications

3.5.1 SPP State

Format: +SPPSTAT=Param
Param:(0~3)
(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected

3.5.2 GATT State

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

3.5.3 SPP Device Information

Format: +SPPDEV=Param
Param: (12 Bytes ASCII), Remote device's MAC address of current SPP connection

3.5.4 GATT Device Information

Format: +GATTDEV=Param
Param: (12 Bytes ASCII), Remote device's MAC address of current GATT connection

3.5.5 SPP Received Data

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

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Param2: Payload
Description: If throughput mode is on, only Param2 will be present
Example: Received data “1234567890” from remote device via SPP << *+SPPDATA=10,1234567890*

3.5.6 GATT Received Data

Format: +GATTDATA=Param1, Param2 Param1: Payload length Param2: Payload
Description: If throughput mode is on, only Param2 will be present
Example: Received data “1234567890” from remote device via GATT << *+GATTDATA=10,1234567890*

3.6 GPIO Indications

3.6.1 LED Pin

LED0(Output)	
Low Level	Initializing
Blink in 1Hz	Ready to connecting
High Level	Connected

3.6.2 State Pin

LED1(Output)	
Low Level	SPP/GATT Disconnected
High Level	SPP/GATT Connected

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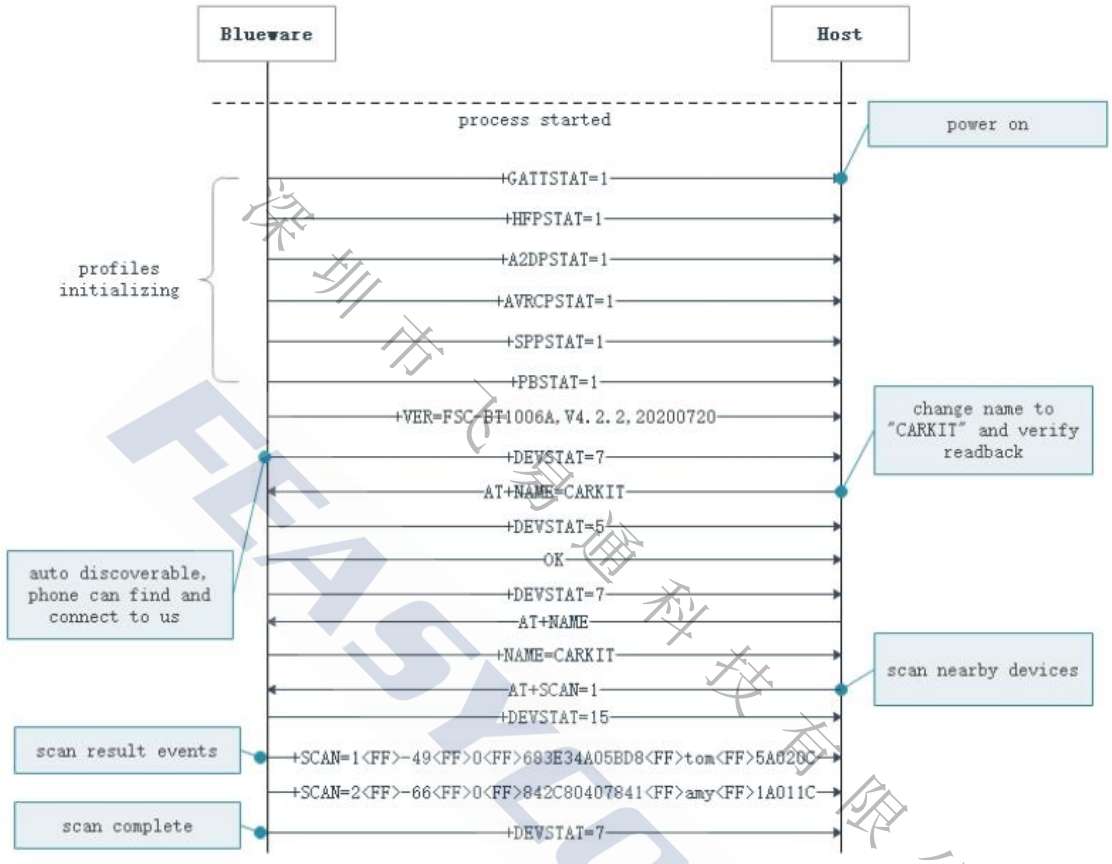
4.Example Message Sequence Charts

4.1MSC for profiles initializing and device scanning



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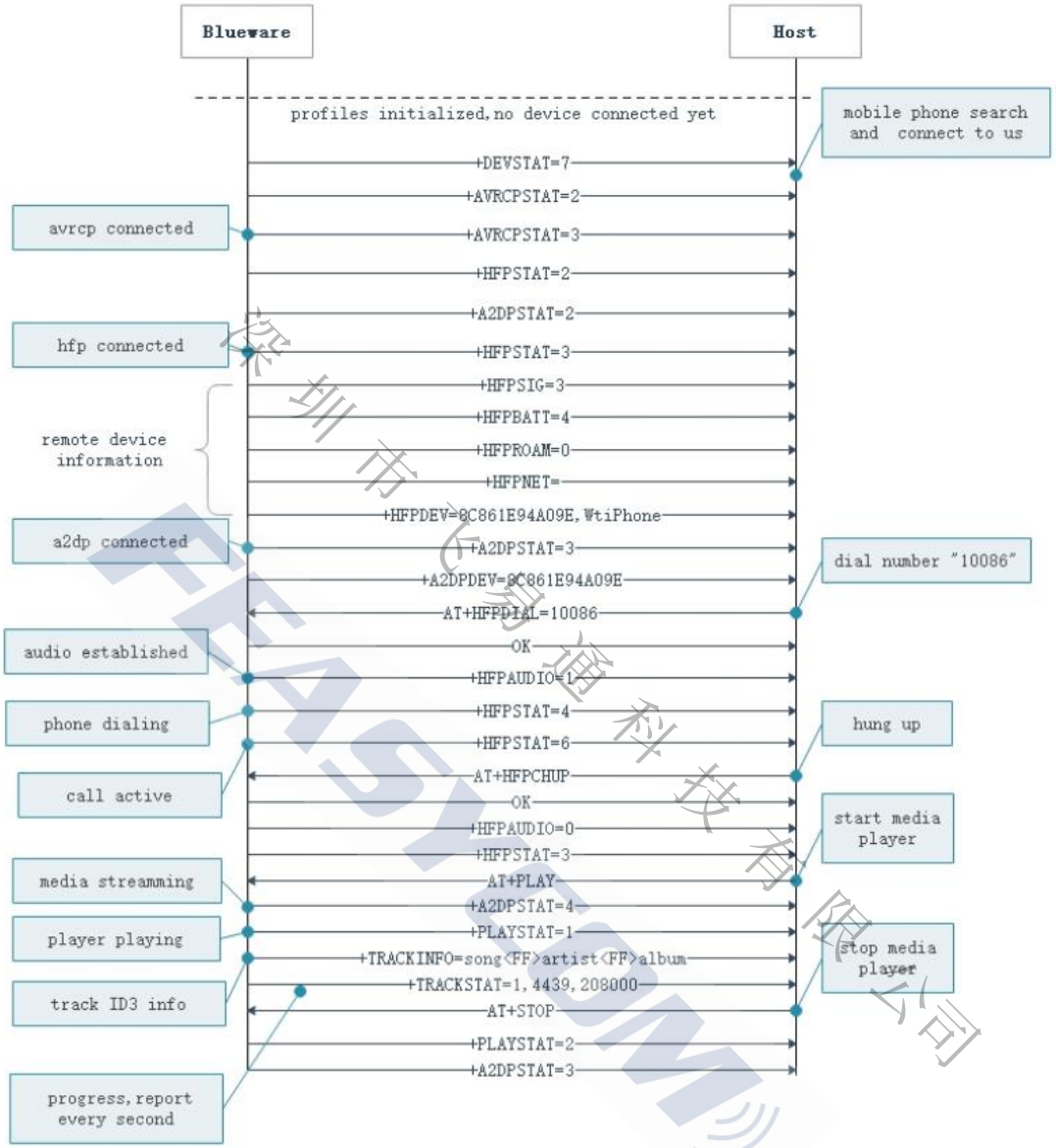
4.2MSC for profiles connection and basic operations



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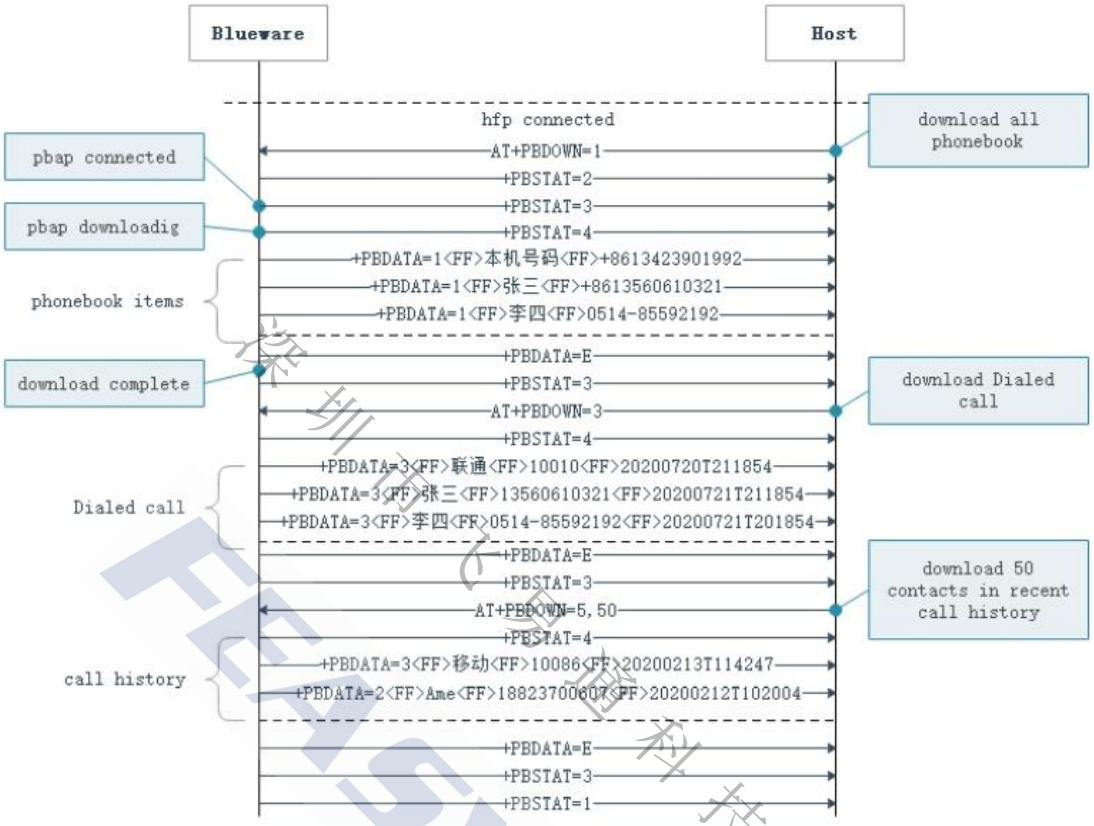
4.3MSC for Phonebook/Contact photo downloading



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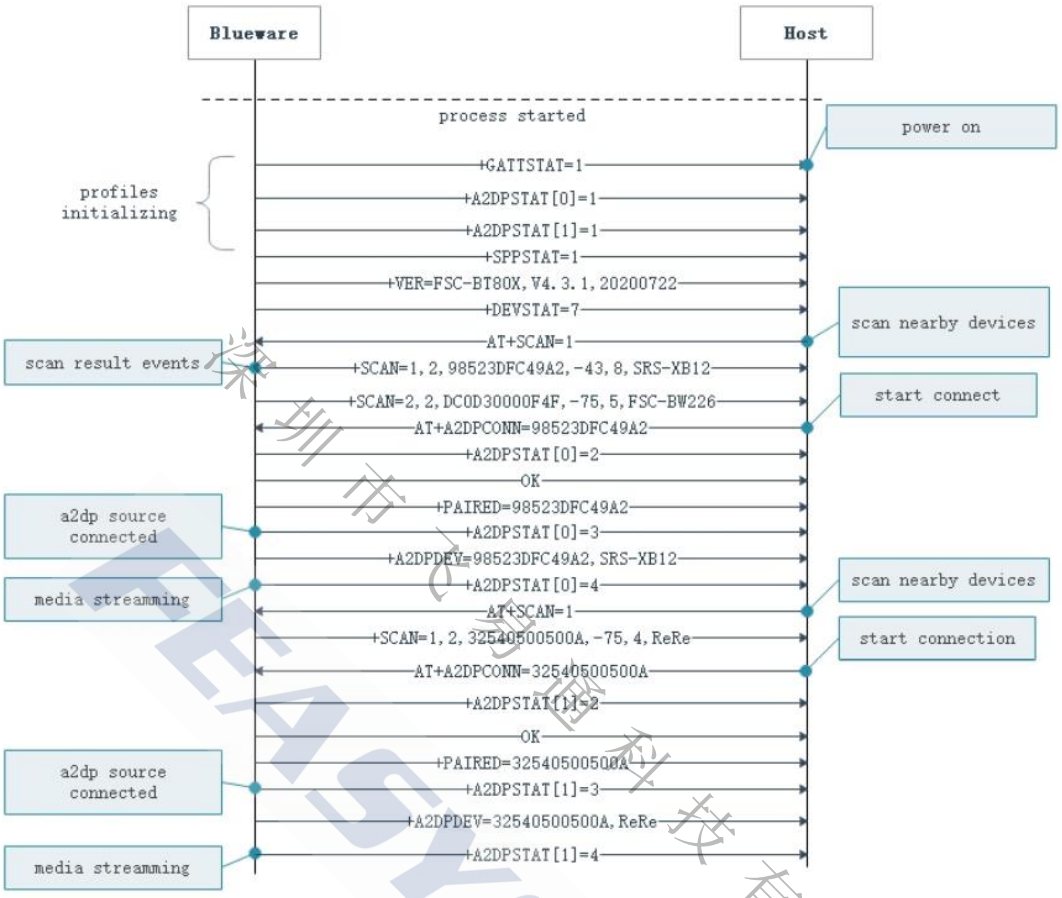
4.4MSC for A2DP Source basic operations



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