AUBTM-23 Bluetooth Module

External Commands

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REVISION HISTORY

Revision Number	Release Date	Authors	Reason of Revisions	Review Date	Reviewers
00.01		Jie Liu	Initial Draft		
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TABLE OF CONTENTS

LIST OF FIGURES

Error! No table of figures entries found.

LIST OF TABLES

1. Introduction

1.1 Background

AUBTM-23 is a Bluetooth v1.2 module with A2DP/AVRCP/HANDSFREE/HEADSET/OPP profiles. The module is intended to be integrated into another HOST system which requires Bluetooth functions. The HOST system could send commands to AUBTM-23 through a UART. AUBTM-23 will parse the commands and execute proper functions, e.g. connect to another Bluetooth device, initiate a phone call.

1.2 Purpose

The purpose of this document is to define the protocol between the HOST system and AUBTM-23 through the UART connection.

The protocol heavily depends on the AT commands of 3GPP 27.007[1] and 27.005 GSM[1] recommendations. Most of the commands are the same with the GSM standard, with several special commands defined by AUSTAR technology.

1.3 Scope

This document is largely concerned with the following contents:

1. the package structure of protocol,
2. the definition of each command sent by the HOST system and its corresponding function.
3. The definition of each response sent by AUBTM-23 and its corresponding meaning.

1.4 Constraint and Limitation

✧ All operations should suck to local laws and regulations.

1.5 Acronyms and Abbreviations

Table 1-1 Acronyms and Definitions

Acronym	Definition

1.6 Terms

Table 1-2 Glossary of Terms

Term	Definition
HOST	The system which integrate AUBTM-23
UART	universal asynchronous receiver/transmitter
Bluetooth	
Profile	
A2DP	

Term	Definition
AVRCP	
HANDSFREE	
HEADSET	
OPP	
SPP	
Bluetooth address	
Pin code	

1.7 Document Organization

1.8 Document Location

2. Protocol Overview

2.1 General

For the exchange of the commands and unsolicited results codes, the format, syntax and procedures of 3GPP 27.007 [1] shall be taken as reference. The following rules specifically apply for this protocol.

• Only one command (or unsolicited result code) per command line needs to be expected.

• The HOST, by default, shall not echo the command characters.

• The HOST shall always transmit result codes using verbose format.

• The characters below shall be used for AT commands and result codes formatting:

<cr> corresponds to the *carriage return (0/13)* as stated in [6]

<lf> corresponds to the *line feed (0/10)* as stated in [6]

• The format of an AT command from the HF to the AG shall be:

<AT command><cr><lf>

• The format of the OK code from the AG to the HF shall be:

<cr><lf>OK<cr><lf>

• The format of the generic ERROR code from the AG to the HF shall be:

<cr><lf>ERROR<cr><lf>

• The format of an unsolicited result code from the AG to the HF shall be:

<cr><lf><result code><cr><lf>

2.2 Message Format

The GSM 07.07 [1] format and syntax rules shall be taken as the reference for these commands.

2.3 Commands Definition

2.4 Overview of supported commands

2.5 Message Definition

2.5.1 AT+REBOOT Reboot the module

COMMAND	PARAMETER
AT+REBOOT	

Description:

This command would reboot the module immediately

Response

value	Description
OK	The command is successful
ERROR	The command is failed

Parameter

Example command:

<cr><lf>AT+REBOOT<cr><lf>

Example response

<cr><lf>OK<cr><lf>

2.5.2 AT+BAUD Read the Baudrate setting

COMMAND	PARAMETER
AT+BAUD=?	

Response

value	Description
OK	The command is successful
ERROR	The command is failed
+BAUD: < UART baud rate>,< stop>,< parity>	

Response Parameter

value	Description

UART baud rate	“0”=no change “9600”=9600 baud “19200”=19200 baud “38400”=38400 baud “57600”=57600 baud “115200”=115200 baud “230400”=230400 baud “460800”=460800 baud “921600”= 921600 baud “1382400”=1382400 baud
stop	“0”=no change “1”=one “2”=two
parity	“0”=no change “1”=none “2”=odd “3”=even

Example response

<cr><lf>OK<cr><lf>
<cr><lf>+BAUD:9600,1,0<cr><lf>

2.5.3 AT+BAUD Set the Baudrate

COMMAND	PARAMETER
AT+BAUD=	< UART baud rate>,< stop>,< parity>

Description:

Set the parameter of UART port

Parameter

value	Description
UART baud rate	“0”=no change “9600”=9600 baud “19200”=19200 baud “38400”=38400 baud “57600”=57600 baud “115200”=115200 baud “230400”=230400 baud “460800”=460800 baud “921600”= 921600 baud “1382400”=1382400 baud
stop	“0”=no change “1”=one “2”=two
parity	“0”=no change “1”=none “2”=odd “3”=even

Response

value	Description

OK	The command is successful
ERROR	The command is failed

Example:

<cr><lf>AT+INQ: “1382400”, “0”, “0”<cr><lf>

Response

<cr><lf>OK <cr><lf>

2.5.4 AT+NAME Read the Local Name

COMMAND	PARAMETER
AT+NAME=?	

Response

value	Description
OK	The command is successful
ERROR	The command is failed
+NAME: <name>	

Response Parameter:

value	Description
name	A string contain the user’s friendly name of the local module The maxim length of name is 20 characters.

Example:

<cr><lf>AT+NAME=?<cr><lf>

Response

<cr><lf>+NAME:AUBTM-20<cr><lf>

2.5.5 AT+NAME Write the Local Name

COMMAND	PARAMETER
AT+NAME=	<name>

Description:

Set The local device's "user friendly" name

Parameter

value	Description
name	A string contain the user’s friendly name of the local module The maxim length of name is 20 characters.

Response

value	Description
OK	The command is successful
ERROR	The command is failed

Example:

<cr><lf>AT+NAME=AUBTM-20<cr><lf>

Response

<cr><lf>OK<cr><lf>

2.5.6 AT+PIN Read the PIN

COMMAND	PARAMETER
AT+PIN=?	

Response

value	Description
OK	The command is successful
ERROR	The command is failed
+PIN:<PIN code>	

Response Parameter

PIN code

value	Description
	The pin code to return when other Bluetooth devices pair with. The maxim length of pin code is 16 digits.

Example:

<cr><lf>AT+PIN=?<cr><lf>

Response

<cr><lf>+PIN:8888<cr><lf>

2.5.7 AT+PIN Write the PIN

COMMAND	PARAMETER
AT+PIN=	PIN code

Description:

Set Bluetooth PIN code of local module. This is the PIN code that the local machine would send when it receives an authentication request from a remote device.

Command Parameter

PIN code

value	Description
	The pin code to return when other Bluetooth devices pair with. The maxim length of pin code is 16 digits.

Response

value	Description
OK	The command is successful
ERROR	The command is failed

Example:

<cr><lf>AT+PIN=8888<cr><lf>

Response

<cr><lf>OK<cr><lf>

2.5.8 AT+BLBDADDR Read Local Bluetooth Address

COMMAND	PARAMETER
AT+ BLBDADDR	

Description:

Get the local device BD ADDR.

Response

value	Description
OK	The command is successful
ERROR	The command is failed
+ BLBDADDR:<Bluetooth address>	

Parameter

Example:

<cr><lf>AT+BLBDADDR<cr><lf>

Response

<cr><lf>+BLBDADDR:00:12:34:56:78:AB<cr><lf>

2.5.9 AT+INQ Start an Inquiry Session

COMMAND	PARAMETER
AT+INQ	

Description:

This command will cause the module to enter Inquiry Mode. Inquiry Mode is used to discover other nearby Bluetooth devices. An "OK" is sent from the module to the Host when the this command has been started by the module. When the Inquiry process is completed, the module will send an +INQ event to the Host indicating that the Inquiry has finished. The event parameters of +INQ event will have a result from the Inquiry process, which reports the address and name of Bluetooth devices that responded.

Response

value	Description
OK	The command is successful
ERROR	The command is failed
+INQ:<Bluetooth address>,<name>[,<Bluetooth address>,<name>]	

Response Parameter

<Bluetooth address>

Value	Description
	format: xx:xx:xx:xx:xx:xx, "x" is from 0 to F

<name>

Value	Description
name	A string contain the user's friendly name of the local module The maxim length of name is 20 characters.

Example:

<cr><lf>AT+INQ<cr><lf>

Response

<cr><lf>+INQ:00:12:39:00:34:35,"Tom's Mobile",00:13:45:46:99:23,"Jerry"<cr><lf>

2.5.10 AT+CON Connect to a Remote Device

COMMAND	PARAMETER
AT+CON=	<profile>,<Bluetooth address>

Description:

This command will cause the module to create an connection to the Bluetooth device with the Bluetooth Address specified by the command parameters. The command also tells the module which profile to connect.

Parameter

<Bluetooth address>

Value	Description
	format: xx:xx:xx:xx:xx:xx, "x" is from 0 to F

<profile>

Value	Description
0	handsfree
1	dun
2	spp
3	opp

Response

value	Description
OK	The command is sent successful
ERROR	The command is failed
+CON:<n>	Return the result of the request for connection

Parameter

<n>

Value	Description
0	The connection has not been established
1	The connection has been established

Example:

<cr><lf>AT+CON=1,00:12:39:00:34:35<cr><lf>

Response

<cr><lf>+CON:1<cr><lf>

2.5.11 AT+DCON Disconnect a Link with a Remote Device

COMMAND	PARAMETER
AT+DCON=	<profile>,<Bluetooth address>

Description:

This command will cause the module to disconnect with the Bluetooth device with the Bluetooth Address specified by the command parameters. The command also tells the module which profile to disconnect.

Parameter

<Bluetooth address>

Value	Description
	format: xx:xx:xx:xx:xx:xx, “x” is from 0 to F

<profile>

Value	Description
0	handsfree
1	dun
2	spp
3	opp

Response

value	Description
OK	The command is sent successful
ERROR	The command has failed
+DCON	Return the result of the disconnect request

Parameter

<n>

Value	Description
0	The request has failed
1	The connection has been disconnected successfully

Example:

<cr><lf>AT+DCON=1,00:12:39:00:34:35 <cr><lf>

Response

<cr><lf>+DCON<cr><lf>

2.5.12 ATD Dial a number for HFP

COMMAND	PARAMETER
ATD	<ddd>

Description:

The HOST use this command to control the module to place a voice call to a specific number.

Parameter:

value	Description
dd..dd	number

Response

value	Description
OK	The command is valid
ERROR	The command is invalid

Response Parameter:

none

Example Command:

<cr><lf>ATD00648756923<cr><lf>

Example response:

<cr><lf>ok<cr><lf>

2.5.13 +RING Incoming call notification

COMMAND	PARAMETER
+RING	<NUMBER>

Description:

The MODULE sends this command to the HOST to notify an incoming call.

Parameter:

<NUMBER>

Value	Description
string	The telephone number of the callee.

Possible Responses

value	Description
OK	The command is valid
ERROR	The command is invalid

Response Parameter:

Example Command:

<cr><lf>+RING=012345678<cr><lf>

Example response:

2.5.14 ATA Answer Call

COMMAND	PARAMETER
ATA	none

Description:

The HOST sends this command to the module to answer an incoming call. If there is no incoming call when the HOST sends this command, the module should send error message to the HOST

Parameter:

none

Possible Responses

value	Description
OK	The command is valid
ERROR	The command is invalid

Response Parameter:

Example Command:

<cr><lf>ATA<cr><lf>

Example response:

<cr><lf>OK<cr><lf>

2.5.15 AT+CHUP Reject /Hang up a Call

COMMAND	PARAMETER
AT+CHUP	

Description:

The HOST sends this command to the module to reject an incoming call. If the call has been answered, this command will terminate the call. If there is no on going call, the module should send error message to the HOST.

Parameter:

None

Possible Response

value	Description
OK	The command is valid
ERROR	The command is invalid

Response Parameter:

none

Example Command:

<cr><lf>AT+CHUP<cr><lf>

Example response:

<cr><lf>OK<cr><lf>

2.5.16 AT+CPBS The start of Phone book synchronous

COMMAND	PARAMETER
AT+CPBS=	<storage>,<bdaddr>

Description:

When HOST send the AT command, HFP informed choice of mobile phone book of the type of storage.

Parameter:

value	Description

storage	“ME”, Phone store. ”SM”, SIM card store.
bdaddr	The address of AG

Response Parameter:

OK/ERROR
+CPBS：< value>

Example Command:

<cr><lf>AT+CPBS=ME<cr><lf>

Example response:

Ok

+CPBS:0

2.5.17 +CPBS The service mode of Phone book synchronous

COMMAND	PARAMETER
+CPBS：	<value>

Description:

HFP inform to the HOST that phone book synchronous has begun, the parameters <value> said of the phone book synchronization service mode. value:

0 AT command service mode

1 OPP profile service mode

2 PBAP profile service mode

Parameter:

Value	Description
value	0 or 1 or 2

Example response:

+CPBS： 0

2.5.18 +CPBR The information of Phone book synchronization

COMMAND	PARAMETER
+CPBR=	<numcard>

Description:

HOST obtained telephone directory information by the command. Telephone information through the standard form of vcard.2.0 sent to the HOST.

Parameter:

Value	Description
numcard	Vcard data about phone book

Example response:

+CBPR=BEGIN:VCARD\nVERSION:2.1\nFN:"yuki"\nTEL:13588088135\nEND:VCARD\n

2.5.19 +PBSS The end of phone book synchronization

COMMAND	PARAMETER
+PBSS	NONE

Description:

Synchronize the phone book has come to an end.

Parameter:

None

Example response:

+PBSS

2.5.20 === SPP data transfer

COMMAND	PARAMETER
===	

Description:

Exit AT command mode. Module enter the SPP data transfer state.

Response

value	Description
OK	The command is successful
ERROR	The command is failed

Parameter

Example command:

<cr><lf>===<cr><lf>

Example response

2.5.21 AT+VOICEDAIL VOICE DAIL

COMMAND	PARAMETER
AT+VOICEDAIL	

Description:

ENTER VOICE DAIL MODE。

Response

value	Description
OK	The command is successful
ERROR	The command is failed

Parameter

Example command:

<cr><lf>AT+VOICEDAIL<cr><lf>

Example response

3. ExaProcess Definition

3.1 Connection Handshake

4. References

[1] 3GPP 27.007 v6.8.0 now supersedes and replaces ETS 300 916, “Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07 version 7.5.0)” http://www.3gpp.org/ftp/Specs/html-info/27007.htm

[2] “GSM 02.30 (version 7.1.0): Digital cellular telecommunications system (Phase 2+); Man-Machine Interface (MMI) of the Mobile Station (MS)”

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