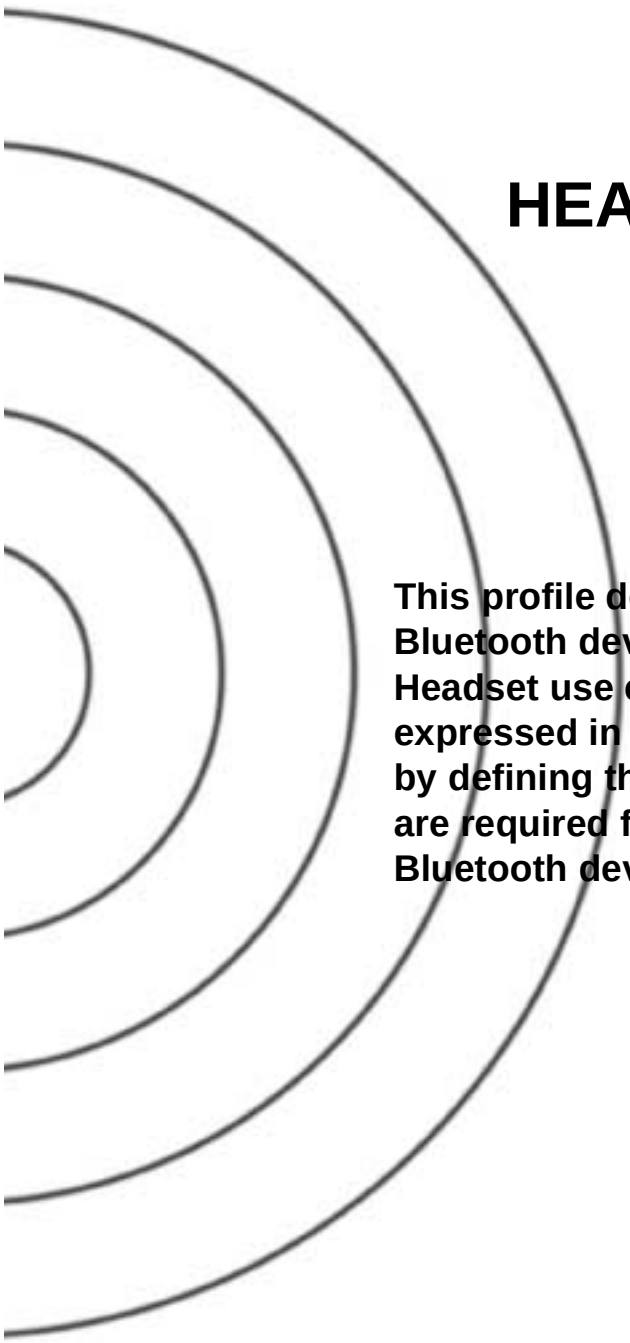
Part K:6



HEADSET PROFILE

This profile defines the requirements for Bluetooth devices necessary to support the Headset use case. The requirements are expressed in terms of end-user services, and by defining the features and procedures that are required for interoperability between Bluetooth devices in the Headset use case.

CONTENTS

1 INTRODUCTION

1.1 SCOPE

This Headset profile defines the protocols and procedures that shall be used by devices implementing the usage model called ‘Ultimate Headset’. The most common examples of such devices are headsets, personal computers, and cellular phones.

The headset can be wirelessly connected for the purposes of acting as the device’s audio input and output mechanism, providing full duplex audio. The headset increases the user’s mobility while maintaining call privacy.

1.2 PROFILE DEPENDENCIES

In Figure 1.1, the Bluetooth profile structure and the dependencies of the profiles are depicted. A profile is dependent upon another profile if it re-uses parts of that profile, by implicitly or explicitly referencing it. Dependency is illustrated in the figure: a profile has dependencies on the profile(s) in which it is contained – directly and indirectly.

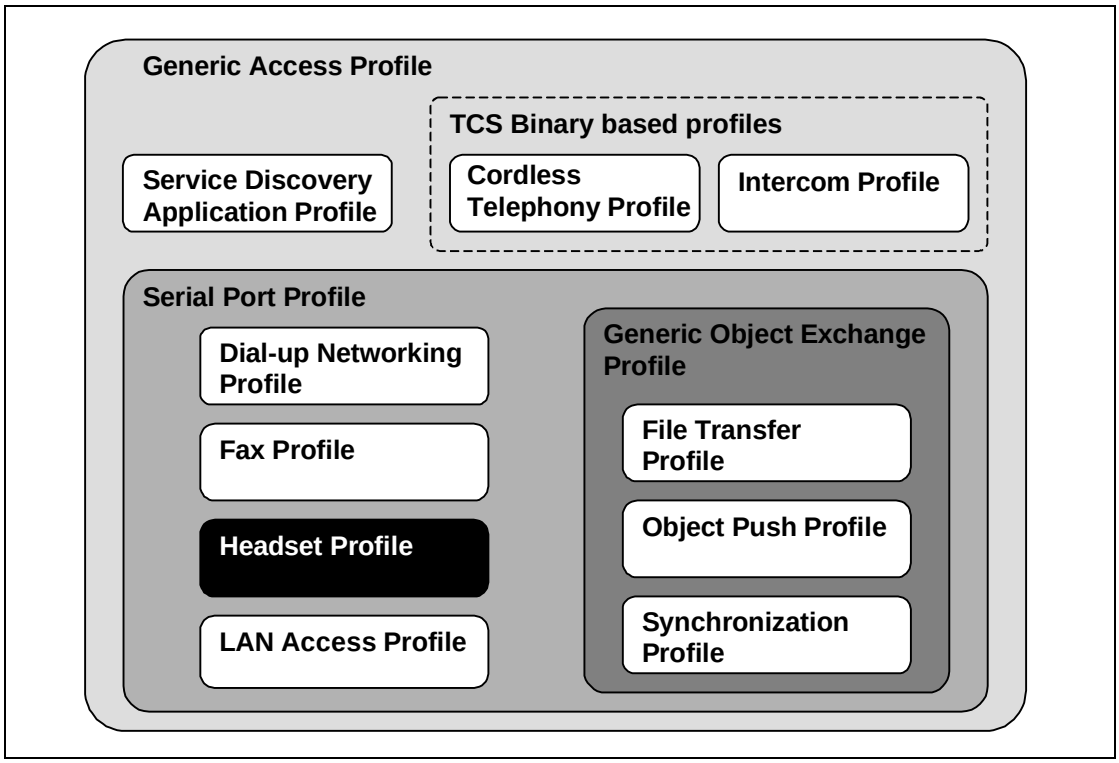


Figure 1.1: Bluetooth Profiles

As indicated in the figure, the Headset profile is dependent upon both the Serial Port Profile and the Generic access profile – details are provided in Section 5, “Serial Port Profile,” on page219 and Section 6, “Generic Access Profile,” on page223 .

1.3 SYMBOLS AND CONVENTIONS

1.3.1 Requirement status symbols

In this document, the following symbols are used:

- ‘M’ for mandatory to support
- ‘O’ for optional to support
- ‘X’ for excluded (used for capabilities that may be supported by the unit but shall never be used in this use case)
- ‘C’ for conditional to support
- ‘N/A’ for not applicable (in the given context it is impossible to use this capability)

Some excluded capabilities are capabilities that, according to the relevant Bluetooth specification, are mandatory. These are features that may degrade operation of devices in this use case. Therefore, these features shall never be activated while a unit is operating as a unit within this use case.

1.4 SIGNALLING DIAGRAM CONVENTIONS

The following arrows are used in diagrams describing procedures:

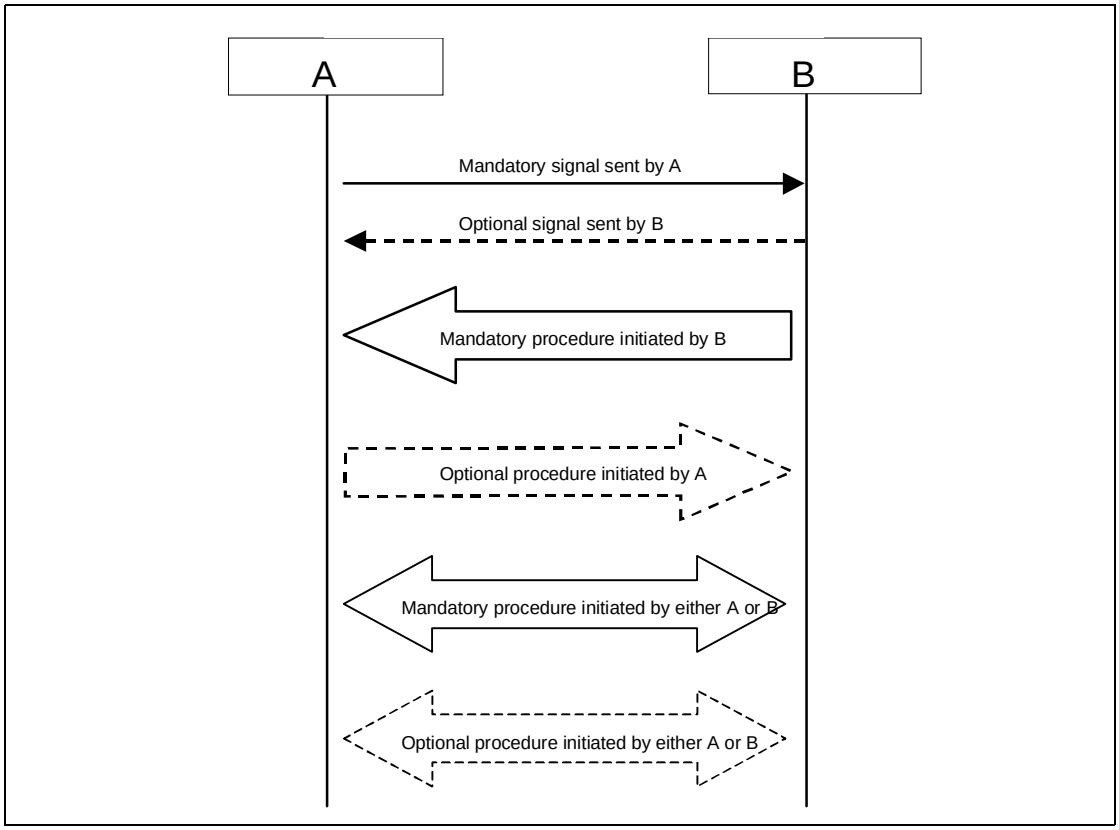


Figure 1.2: Arrows used in signalling diagrams

2 PROFILE OVERVIEW

2.1 PROFILE STACK

The figure below shows the protocols and entities used in this profile.

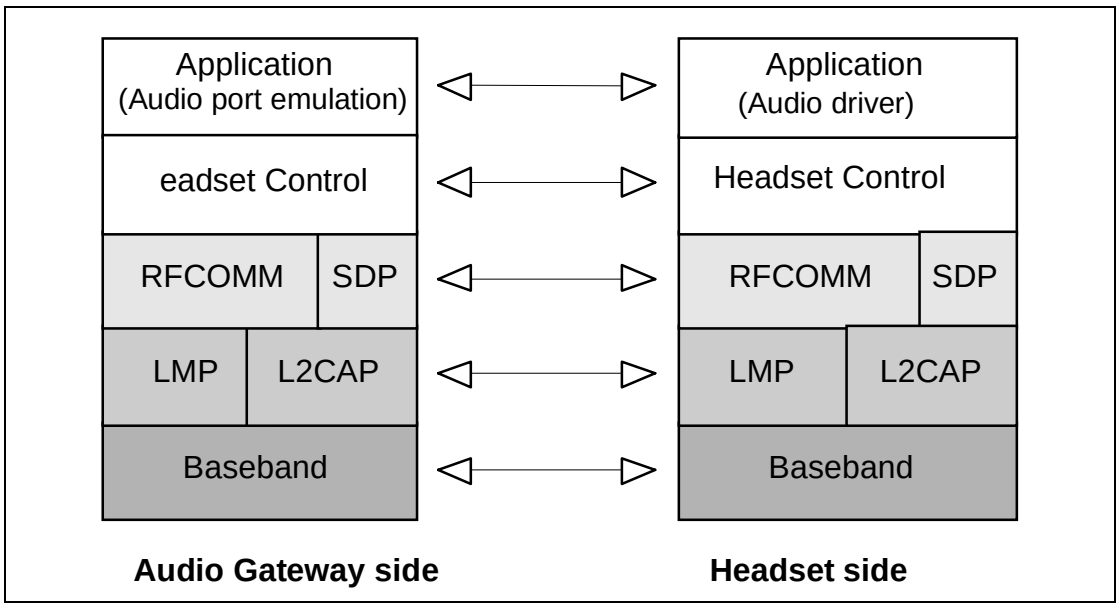


Figure 2.1: Protocol model

The Baseband, LMP and L2CAP are the OSI layer 1 and 2 Bluetooth protocols. RFCOMM is the Bluetooth adaptation of GSM TS 07.10 [5]. SDP is the Bluetooth Service Discovery Protocol. Headset Control is the entity responsible for headset specific control signalling; this signalling is AT command based.

Note: although not shown in the model above, it is assumed by this profile that Headset Control has access to some lower layer procedures (for example SCO link establishment).

The audio port emulation layer shown in Figure 2.1 is the entity emulating the audio port on the cellular phone or PC, and the audio driver is the driver software in the headset.

For the shaded protocols/entities in Figure 2.1, the Serial Port Profile is used as base standard. For these protocols, all requirements stated in the Serial Port Profile apply except in those cases where this profile explicitly states deviations.

2.2 CONFIGURATION AND ROLES

The figures below show two typical configurations of devices for which the Headset profile is applicable:

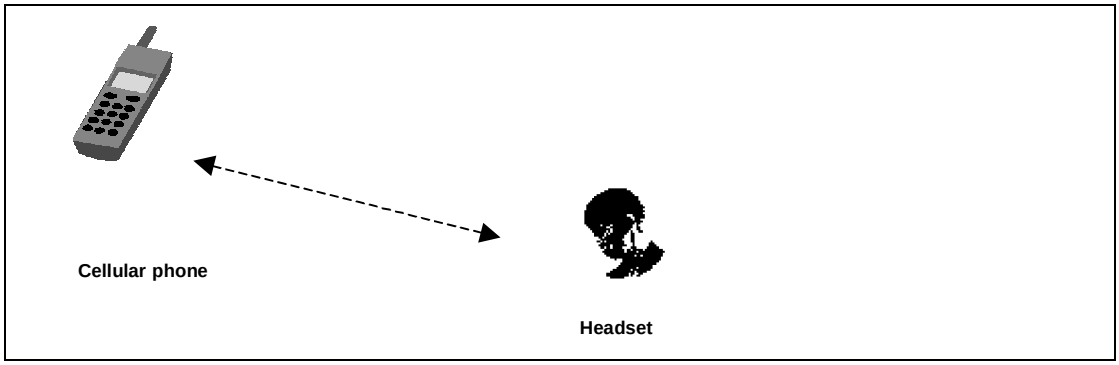


Figure 2.2: Headset profile, example with cellular phone

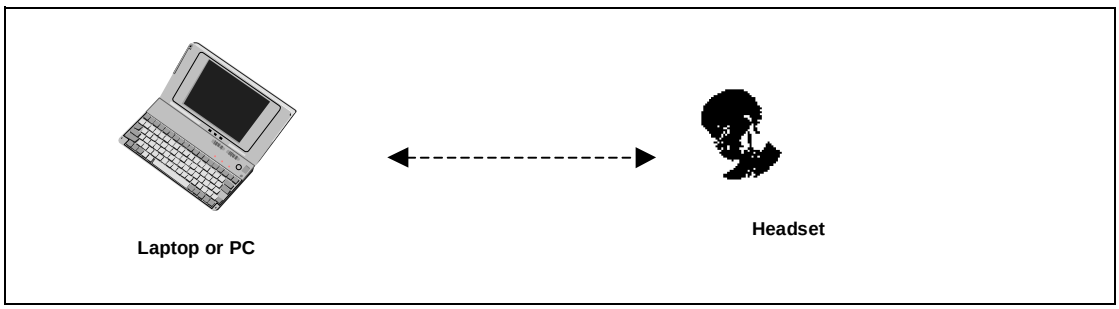


Figure 2.3: Headset profile, example with personal computer

The following roles are defined for this profile:

Audio Gateway **(AG)** – This is the device that is the gateway of the audio, both for input and output. Typical devices acting as Audio Gateways are cellular phones and personal computer.

Headset **(HS)** – This is the device acting as the Audio Gateway's remote audio input and output mechanism.

These terms are in the rest of this document only used to designate these roles.

2.3 USER REQUIREMENTS AND SCENARIOS

The Headset profile defines the protocols and procedures that shall be used by devices implementing the use case called ‘Ultimate Headset’.

The following restrictions apply to this profile:

a) For this profile, it is assumed that the ultimate headset use case is the only use case active between the two devices;

b) The profile mandates the usage of CVSD for transmission of audio (for the Bluetooth part). The resulting audio is monophonic, with a quality that – under normal circumstances – will not have perceived audio degradation.

c) Between headset and audio gateway, only one audio connection at a time is supported;

d) The audio gateway controls the SCO link establishment and release. The headset directly connects (disconnects) the internal audio streams upon SCO link establishment (release). Valid speech exists on the SCO link in both directions, once established;

e) The profile offers only basic interoperability – for example, handling of multiple calls at the audio gateway is not included;

f) The only assumption on the headset’s user interface is the possibility to detect a user initiated action (e.g. pressing a button).

2.4 PROFILE FUNDAMENTALS

A headset may be able to use the services of audio gateway without the creation of a secure connection. It is up to the user, if he/she wants to enforce security on devices that support authentication and/or encryption in the execution of this profile. If baseband authentication and/or encryption is desired, the two devices have to create a secure connection, using the GAP authentication procedure as described in Section 5.1 of the Generic Access profile. This procedure may then include entering a PIN code, and will include creation of link keys. In most cases, the headset will be a device with a limited user interface, so the (fixed) pin code of the headset will be used during the GAP authentication procedure.

A link has to be established when a call is initiated or received. Normally, this requires paging of the other device but, optionally, it may require unparking.

There are no fixed master/slave roles.

The audio gateway and headset provide serial port emulation. For the serial port emulation, RFCOMM is used. The serial port emulation is used to transport the user data including modem control signals and AT commands from the headset to the audio gateway. AT commands are parsed by the audio gateway and responses are sent to the headset.

2.5 CONFORMANCE

If conformance to this profile is claimed, all capabilities indicated as mandatory for this profile shall be supported in the specified manner (process-mandatory). This also applies for all optional and conditional capabilities for which support is indicated. All mandatory capabilities, and optional and conditional capabilities for which support is indicated, are subject to verification as part of the Bluetooth certification program.

3 APPLICATION LAYER

This section describes the feature requirements on units complying with the Headset profile.

Table 3.1 shows the feature requirements made by this profile.

	Feature	Support in HS	Support in AG
1.	Incoming audio connection	M	M
2.	Outgoing audio connection	M	O
3.	Audio connection transfer	M	M
4.	Remote audio volume control	O	O

Table 3.1: Application layer procedures

In the table above, incoming and outgoing shall be interpreted from the headset (HS) point of view.

Table 3.2 maps each feature to the procedures used for that feature. All procedures are mandatory if the feature is supported.

	Feature	Procedure	Ref.
1.	Incoming audio connection	Incoming audio connection establishment	4.2
		Audio connection release	4.4
2.	Outgoing audio connection	Outgoing audio connection establishment	4.3
		Audio connection release	4.4
3.	Audio connection transfer	Audio connection transfer	4.5
4.	Remote audio volume control	Remote audio volume control	4.6

Table 3.2: Application layer feature to procedure mapping

4 HEADSET CONTROL INTEROPERABILITY REQUIREMENTS

4.1 INTRODUCTION

The interoperability requirements for the Headset Control entity are completely contained in this chapter. Section 4.2 until 4.6 specify the requirements for the procedures directly relating to the application layer features.

Section 4.7 specifies the AT commands and results codes used for signalling purposes.

Section 4.8 specifies how the layers beneath the Headset Control entity are used to establish and release a connection.

4.2 AUDIO GATEWAY INITIATED ACL CONNECTION ESTABLISHMENT

Upon an internal or user generated event, the AG will initiate connection establishment (see Section 4.8), and once the connection is established, will send an unsolicited result code RING to alert the user (if necessary). The RING may be repeated for as long as the connection establishment is pending.The SCO link establishment can take place anytime after the ACL connection establishment

Optionally, the AG may provide an in-band ringing tone[1]. In this case, first SCO link establishment takes place. In this case, the SCO link establishment takes place first.

1. The in-band ringing tone is used to alert the user in the headset earpiece when the user is wearing the headset on his head.

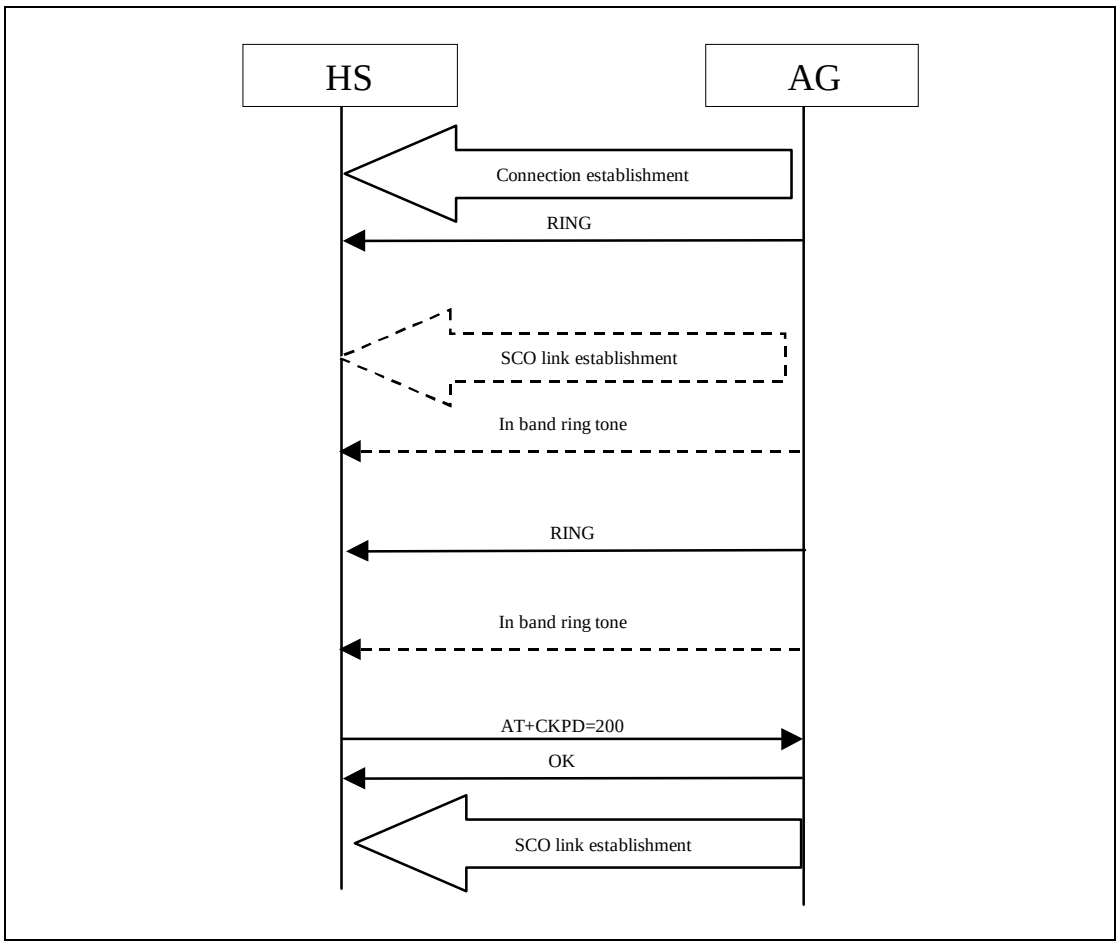


Figure 4.1: Incoming audio connection establishment

In cases where the user is alerted, the user accepts the incoming audio connection by performing a user-initiated action (e.g. pressing a button on the headset). When the user initiates the action, the HS will send the AT+CKPD command (see Section 4.7) to the AG, whereupon the AG shall establish the SCO link, if not already established earlier.

4.3 HEADSET INITIATED ACL CONNECTION ESTABLISHMENT

A headset initiated ACL connection is established (see Section 4.8) on the HS by a user-initiated action (e.g. pressing a button on the headset). Upon connection establishment, the HS shall send the AT+CKPD command to the AG.

The AG may initiate a SCO connection after the completion of the ACL connection establishment before receiving the AT+CKPD command from the HS. This may be desirable when the AG is a mobile phone. In all cases, the AG is responsible for establishing the SCO link if needed. Further internal actions may be needed on the AG to internally establish and/or route the audio stream to the HS[2].

In the figure, the SCO link connection should be possible prior to receiving the AT+CKPD message.

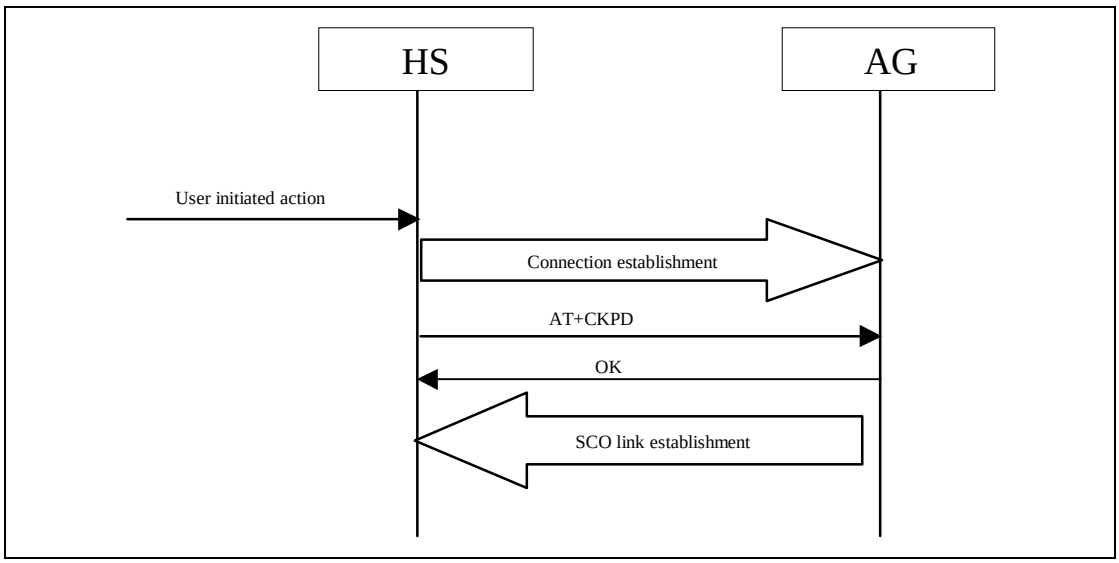


Figure 4.2: Outgoing audio connection establishment

4.4 AUDIO CONNECTION RELEASE

A call can be terminated either on the HS or on the AG. On the HS based upon the button being pushed, on the AG based upon internal actions or user intervention.

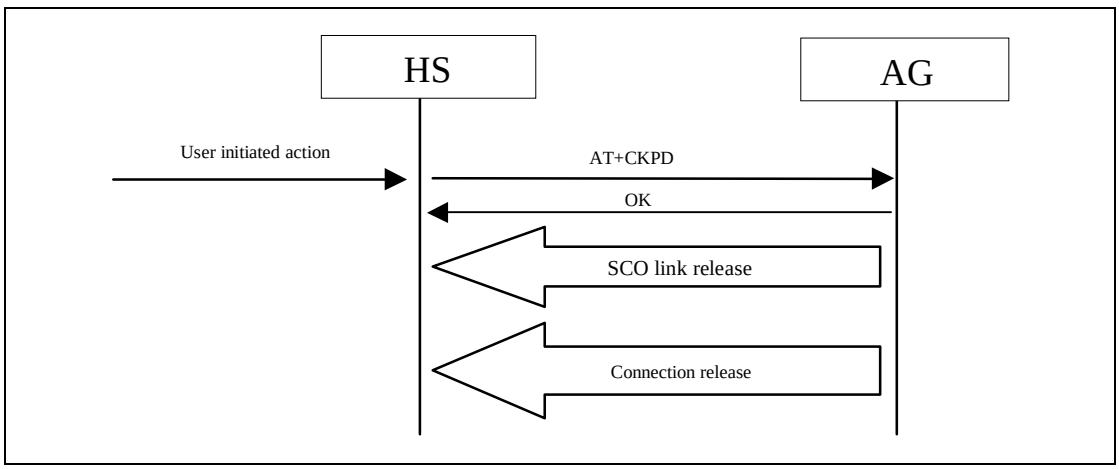


Figure 4.3: Audio connection release – HS initiated

2. For a cellular phone a cellular call may need to be established, e.g. using last dialled number, pre-programmed number. For a personal computer this e.g. relates to playing a .wav file, or audio CD.

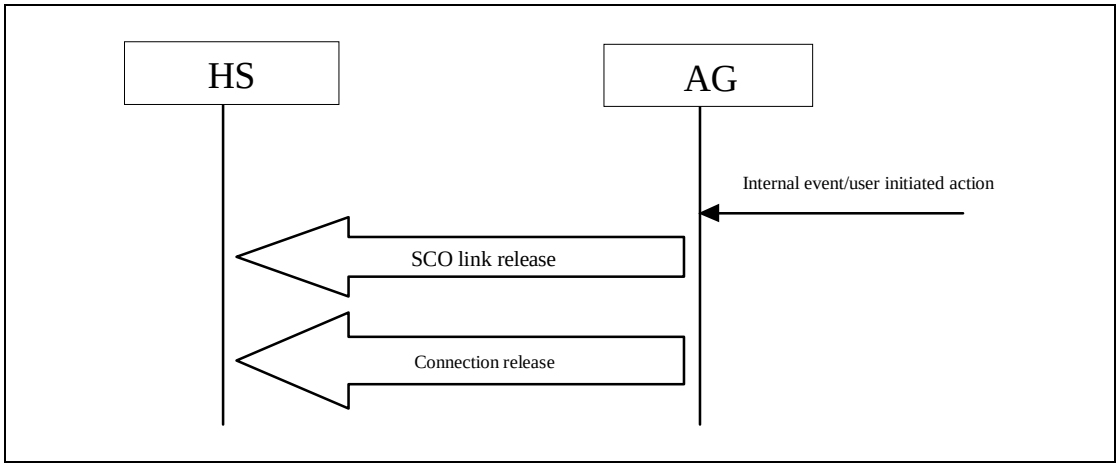


Figure 4.4: Audio connection release – AG initiated

Irrespective of the initiating side, the AG is responsible for releasing the connection (see Section 4.8).

4.5 AUDIO CONNECTION TRANSFER

An audio connection can be transferred from AG to HS or from HS to AG. The connection is transferred to the device initiating the transfer.

4.5.1 Audio connection transfer from AG to HS

The audio connection transfer from AG to HS is initiated by a user action on the HS side, which results in an AT+CKPD command being sent to the AG.

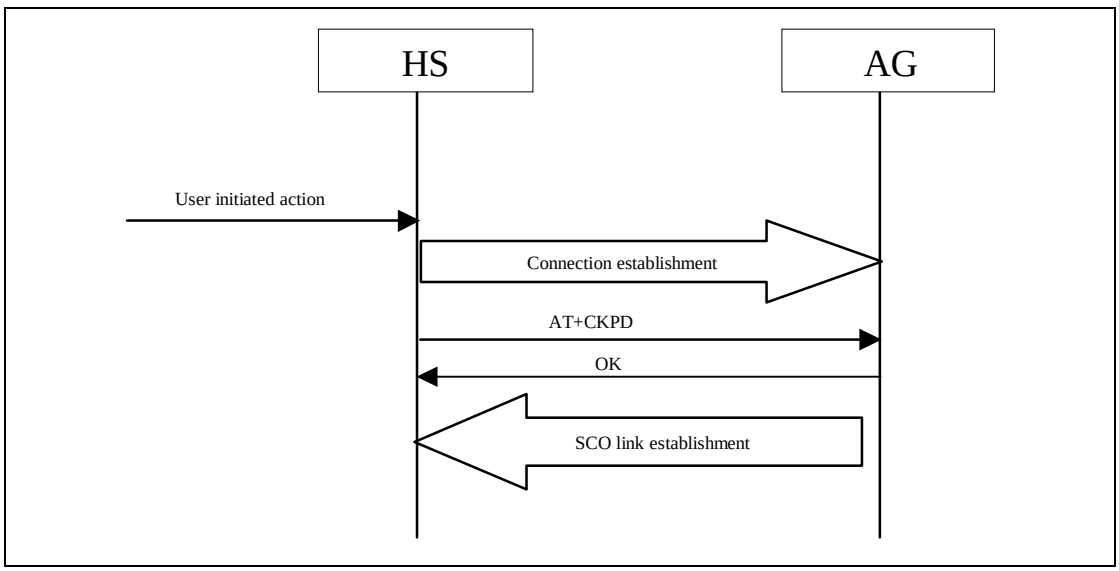


Figure 4.5: Audio connection transfer from AG to HS

4.5.2 Audio connection transfer from HS to AG

The audio connection transfer from HS to AG is initiated by a user action on the AG.

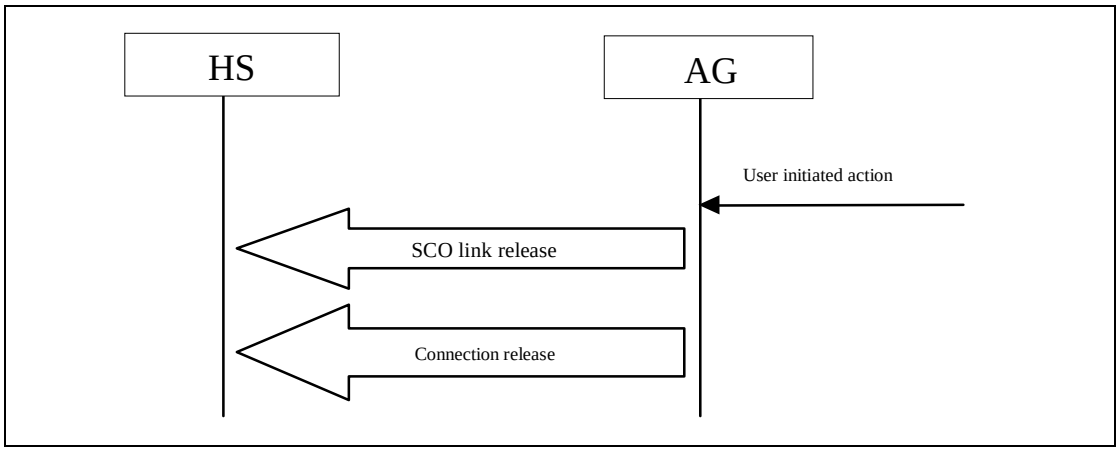


Figure 4.6: Audio connection transfer from HS to AG

4.6 REMOTE AUDIO VOLUME CONTROL

The AG can control the gain of the microphone and speaker of the HS by sending unsolicited result codes +VGM and +VGS respectively. There is no limit to the amount and order of result codes, as long as there is an active audio connection ongoing. When supporting the remote audio volume control, an implementation is not mandated to support both the control of the microphone volume and speaker volume.

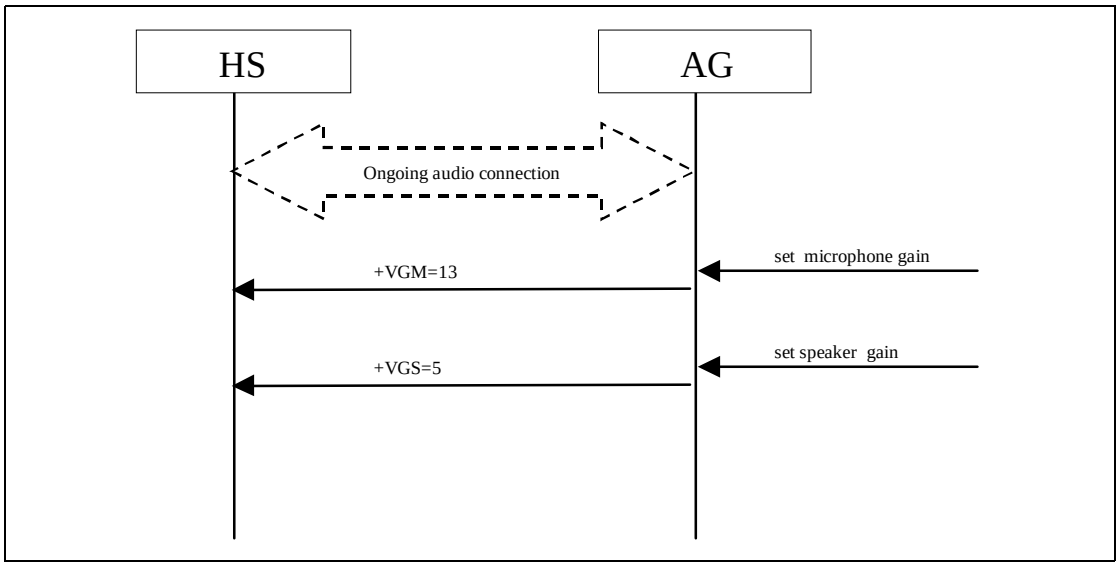


Figure 4.7: Audio volume control – example flow

Both the speaker and microphone gain are represented as parameter to the +VGS and +VGM, on a scale from 0 to 15. The values are absolute values, relating to a particular (implementation-dependent) volume level controlled by the HS.

The HS may store the VGS and VGM settings at connection release, to restore the volume levels at the next connection establishment. At connection establishment, the HS shall inform the AG of the (restored) volume levels using the AT commands +VGS and +VGM. In case physical mechanisms(buttons, dials etc.)means are implemented on the HS to control the volume levels, the HS shall also use the AT commands +VGS and +VGM to inform the AG of any changes in the volume levels.

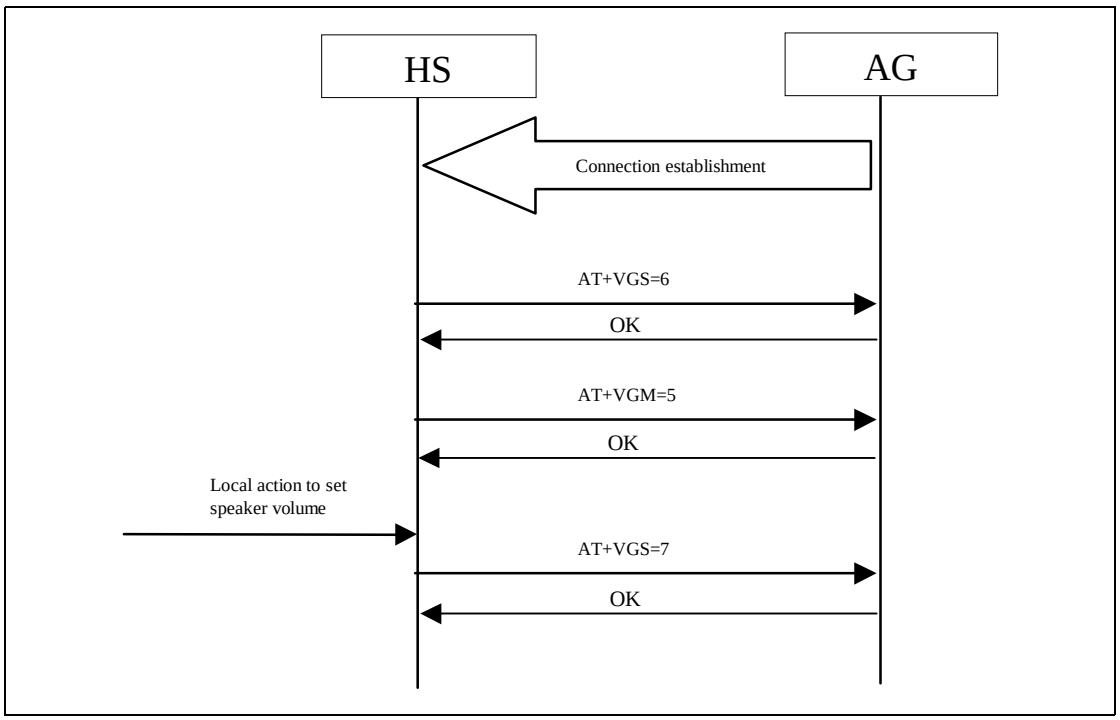


Figure 4.8: Volume level synchronization – example flow

4.7 AT COMMANDS AND RESULT CODES

4.7.1 General

The command line termination character shall be carriage return (IA5 0/13). The response formatting character shall be line feed (IA5 0/10). The AG shall not echo command characters[1]. The AG shall transmit result codes, using the verbose (rather than numeric) format.

1This is the opposite of the default recommended by V.250[1]

The format for a command from the HS to the AG is thus:

AT<cmd>=<value><cr>

If the command is processed successfully, the resulting response from the AG to the HS is:

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

If the command is not processed successfully, the resulting response from the AG to the HS is:

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

The format for an unsolicited result code (such as RING) from the AG to the HS is:

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

The headset profile uses a subset of AT commands and result codes from existing standards. These are listed in Section 4.7.2. For those AT commands and result codes where no existing commands applied, Section 4.7.3 defines additional ones.

4.7.2 AT capabilities re-used from V.250

The mandatory set of AT commands and unsolicited result codes are indicated in Table 4.1 below.

AT capability	Description
RING	The Incoming call indication of V.250 [1], Section 6.3.4.

Table 4.1: Mandatory AT capabilities

4.7.3 Bluetooth-defined AT capabilities

Optionally, the AT capabilities as indicated in Table 4.2 may be supported.

AT capability	Syntax	Description	Values
Microphone gain	+VGM=<gain>	Unsolicited result code issued by the AG to set the microphone gain of the HS. <gain> is a decimal numeric constant, relating to a particular (implementation-dependent) volume level controlled by the HS.	<gain>: 0-15
Speaker gain	+VGS=<gain>	Unsolicited result code issued by the AG to set the speaker gain of the HS. <gain> is a decimal numeric constant, relating to a particular (implementation-dependent) volume level controlled by the HS.	<gain>: 0-15
AT capability	**Syntax**	**Description**	**Values**
Microphone gain level report	+VGM=<gain>	Command issued by the HS to report the current microphone gain level setting to the AG. <gain> is a decimal numeric constant, relating to a particular (implementation-dependent) volume level controlled by the HS.	<gain>: 0-15
Speaker gain level indication report	+VGS=<gain>	Command issued by the HS to report the current speaker gain level setting to the AG. <gain> is a decimal numeric constant, relating to a particular (implementation-dependent) volume level controlled by the HS.	<gain>: 0-15
Headset button press	+CKPD=200	Command issued by HS to indicate that the button has been pressed	

Table 4.2: Optional AT capabilities

4.8 LOWER LAYER HANDLING

This section describes how the layers below the Headset Control entity are used to establish and release a connection.Section 4.8.1 describes how connections are handled when the PARK mode is not supported. Section 4.8.2 describes how connections are handled when the PARK mode is supported.

4.8.1 Connection handling without PARK mode

4.8.1.1 Connection establishment

Both the HS and the AG can initiate connection establishment. If there is no RFCOMM session between the AG and the HS, the initiating device shall first initialize RFCOMM. Connection establishment shall be performed as described in Section 7.3 of GAP and Section 3 of SPP.

4.8.1.2 Connection release

When the audio connection is released, the connection may be released as well. The AG always initiates connection release.

4.8.2 Connection handling with PARK mode

4.8.2.1 Connection establishment

If the PARK mode is supported, the connection is established once (e.g. on the first request for an audio connection). Later, when an audio connection is required, the parked device is unparked. In this section, for correct interpretation of the flows given in Section 4.2 to 4.6, the connection establishment is referred to as *initial* connection establishment, whereas the unparking is referred to as connection establishment.

Initial connection establishment shall be performed as described in Section 7.3 of GAP and Section 3 of SPP. Both sides may initiate the initial connection establishment. After initial connection establishment, the park mode is activated.

In Figure 4.9 the behavior is described in case an audio connection needs to be established – the parked device will be unparked. The unpark can be initiated from either side, depending where the request for an audio connection originated. If the PARK mode is used, neither RFCOMM DLCs nor the L2CAP channel is released.

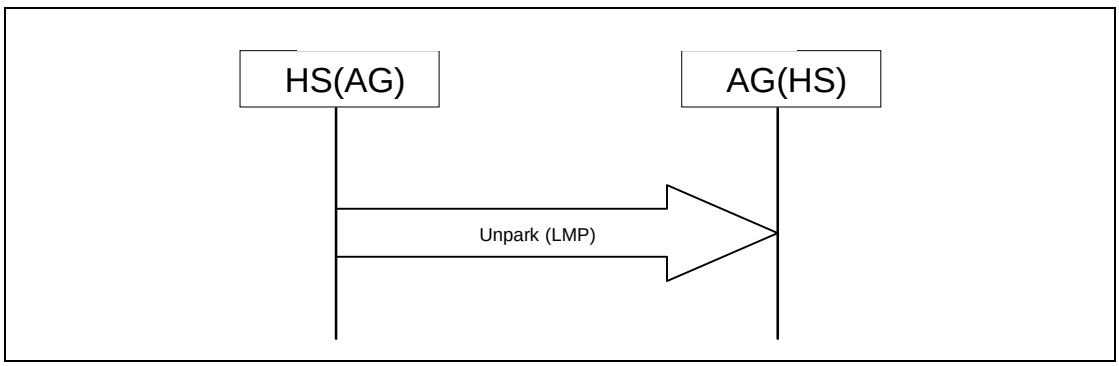


Figure 4.9: Connection establishment – Unparking a parked device

4.8.2.2 Connection release

When the audio connection is released, the connection is parked again, as indicated in Figure 4.10.

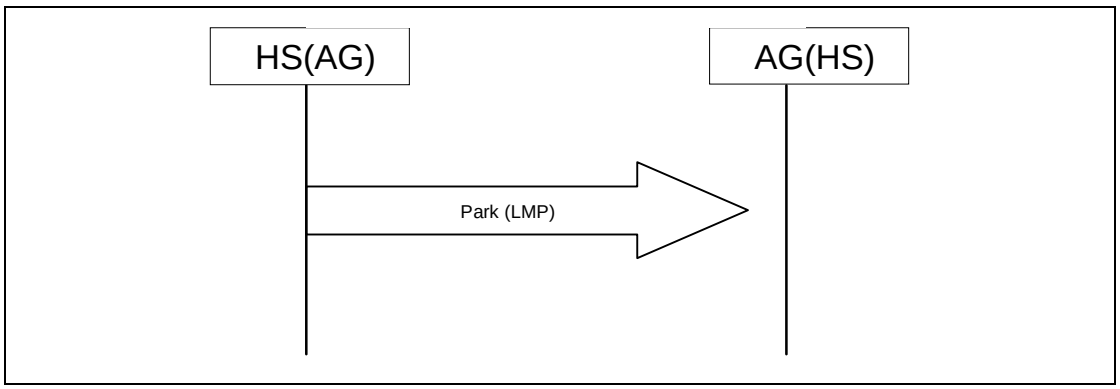


Figure 4.10: Connection release – Parking

When the audio connection is released, the complete connection may alternatively be released. The AG always initiates connection release.

5 SERIAL PORT PROFILE

This profile requires compliance with the Serial Port Profile. The following text together with the associated sub-clauses defines the requirements with regard to this profile, in addition to the requirements as defined in the Serial Port Profile.

As with the headset profile, both the AG and the HS can initiate connection establishment. For the purposes of reading the Serial Port Profile, both the AG and the HS can assume the role of Device A and B.

5.1 RFCOMM INTEROPERABILITY REQUIREMENTS

For the RFCOMM layer, no additions to the requirements as stated in the Serial Port Profile Section 4 shall apply.

5.2 L2CAP INTEROPERABILITY REQUIREMENTS

For the L2CAP layer, no additions to the requirements as stated in the Serial Port Profile Section 5 shall apply.

5.3 SDP INTEROPERABILITY REQUIREMENTS

This profile defines following service records for the headset and the audio gateway respectively.

The codes assigned to the mnemonics used in the Value column as well as the codes assigned to the attribute identifiers (if not specifically mentioned in the AttrID column) can be found in the Bluetooth Assigned Numbers section.

Item	Definition	Type	Value	AttrID	Status	Default
ServiceClassIDList					M	
ServiceClass0		UUID	Headset		M	
ServiceClass1		UUID	Generic Audio		M	
ProtocolDescriptorList					M	
Protocol0		UUID	L2CAP		M	
Protocol1		UUID	RFCOMM		M	
Protocol Specific Parameter0	Server Channel	Uint8	N=server channel #		M	
BluetoothProfile DescriptorList					O	
Profile0	Supported Profiles	UUID	Headset		M	Headset
Param0	Profile Version	Uint16	0x0100*		M	0x0100
ServiceName	Display-able Text name	String	Service-provider defined		O	‘Headset’
Remote audio volume control		Bool-ean	True/False		O	False

Table 5.1: Service Record for Headset

*. Indicating version 1.0

Item	Definition	Type	Value	AttrID	Status	Default
ServiceClassIDList					M	
ServiceClass0		UUID	Headset Audio Gateway		M	
ServiceClass1		UUID	Generic Audio		M	
ProtocolDescriptorList					M	
Protocol0		UUID	L2CAP		M	
Protocol1		UUID	RFCOMM		M	
Protocol Specific Parameter0	Server Channel	Uint8	N=server channel #		M	
BluetoothProfile DescriptorList						
Profile0	Supported Profile	UUID	Headset		M	Headset
Param0	Profile Version	Uint16	0x0100*		M	0x0100
ServiceName	Display-able Text name	String	Service-provider defined		O	'Voice gateway'

Table 5.2: Service Record for the Audio Gateway

*. Indicating version 1.0

5.4 LINK MANAGER (LM) INTEROPERABILITY REQUIREMENTS

In addition to the requirements for the Link Manager as stated in the "Serial Port Profile" on page 171, this profile mandates support for SCO links, in both the HS and AG.

5.5 LINK CONTROL (LC) INTEROPERABILITY REQUIREMENTS

In the table below, changes to the support status as listed in the Serial Port Profile, Section 8, Table 8.1 on page 191 are listed.

	Capability	Support in AG	Support in HS
1.	Inquiry		X
2.	Inquiry scan	X	
3.	Paging		
4.	Page scan		
A	Type R0		
B	Type R1		
C	Type R2		
7.	Voice codec		
C	CVSD	M	M

Table 5.3: LC capabilities

5.5.1 Class of Device

A device which is active in the HS role shall, in the Class of Device field:

1. Set the bit ‘Audio’ in the Service Class field
2. Indicate ‘Audio’ as Major Device class
3. Indicate “Headset” as the Minor Device class

An inquiring AG may use this to filter the inquiry responses.

6 GENERIC ACCESS PROFILE

This section defines the support requirements for the capabilities as defined in Generic Access Profile.

6.1 MODES

The table shows the support status for Modes within this profile.

	Procedure	Support in HS	Support in AG
1	Discoverability modes		
	Non-discoverable mode	M	N/A
	Limited discoverable mode	O	N/A
	General discoverable mode	M	N/A
2	Connectability modes		
	Non-connectable mode	N/A	N/A
	Connectable mode	M	M
3	Pairing modes		
	Non-pairable mode	O	O
	Pairable mode	O	O

Table 6.1: Modes

6.2 SECURITY ASPECTS

No changes to the requirements as stated in the Generic Access Profile.

6.3 IDLE MODE PROCEDURES

The table shows the support status for Idle mode procedures within this profile.

	Procedure	Support in HS	Support in AG
1	General inquiry	N/A	M
2	Limited inquiry	N/A	O
3	Name discovery	N/A	O
4	Device discovery	N/A	O
5	Bonding	O(	O(

Table 6.2: Idle mode procedures

7 REFERENCES

[1] International Telecommunication Union, “ITU-T Recommendation V.250”

[2] ETS 300 916 (GSM 07.07) version 5.6.0

8 LIST OF FIGURES

9 LIST OF TABLES

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易迪拓培训(www.edatop.com)由数名来自于研发第一线的资深工程师发起成立，致力并专注于微波、射频、天线设计研发人才的培养；我们于 2006 年整合合并微波 EDA 网(www.mweda.com)，现已发展成为国内最大的微波射频和天线设计人才培养基地，成功推出多套微波射频以及天线设计经典培训课程和 ADS、HFSS 等专业软件使用培训课程，广受客户好评；并先后与人民邮电出版社、电子工业出版社合作出版了多本专业图书，帮助数万名工程师提升了专业技术能力。客户遍布中兴通讯、研通高频、埃威航电、国人通信等多家国内知名公司，以及台湾工业技术研究院、永业科技、全一电子等多家台湾地区企业。

易迪拓培训推荐课程列表： http://www.edatop.com/peixun/tuijian/

射频工程师养成培训课程套装

该套装精选了射频专业基础培训课程、射频仿真设计培训课程和射频电路测量培训课程三个类别共 30 门视频培训课程和 3 本图书教材；旨在引领学员全面学习一个射频工程师需要熟悉、理解和掌握的专业知识和研发设计能力。通过套装的学习，能够让学员完全达到和胜任一个合格的射频工程师的要求…

课程网址：http://www.edatop.com/peixun/rfe/110.html

手机天线设计培训视频课程

该套课程全面讲授了当前手机天线相关设计技术，内容涵盖了早期的外置螺旋手机天线设计，最常用的几种手机内置天线类型——如 monopole 天线、PIFA 天线、Loop 天线和 FICA 天线的设计，以及当前高端智能手机中较常用的金属边框和全金属外壳手机天线的设计；通过该套课程的学习，可以帮助您快速、全面、系统地学习、了解和掌握各种类型的手机天线设计，以及天线及其匹配电路的设计和调试...

课程网址： http://www.edatop.com/peixun/antenna/133.html

WiFi 和蓝牙天线设计培训课程

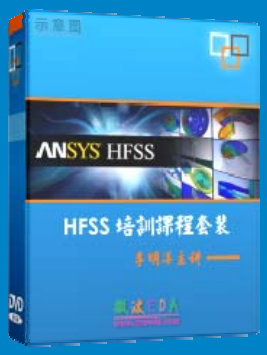
该套课程是李明洋老师应邀给惠普 (HP)公司工程师讲授的 3 天员工内训课程录像，课程内容是李明洋老师十多年工作经验积累和总结，主要讲解了 WiFi 天线设计、HFSS 天线设计软件的使用，匹配电路设计调试、矢量网络分析仪的使用操作、WiFi 射频电路和 PCB Layout 知识，以及 EMC 问题的分析解决思路等内容。对于正在从事射频设计和天线设计领域工作的您，绝对值得拥有和学习！…

课程网址：http://www.edatop.com/peixun/antenna/134.html

CST 学习培训课程套装

该培训套装由易迪拓培训联合微波 EDA 网共同推出，是最全面、系统、专业的 CST 微波工作室培训课程套装，所有课程都由经验丰富的专家授课，视频教学，可以帮助您从零开始，全面系统地学习 CST 微波工作的各项功能及其在微波射频、天线设计等领域的设计应用。且购买该套装，还可超值赠送 3 个月免费学习答疑…

课程网址：http://www.edatop.com/peixun/cst/24.html

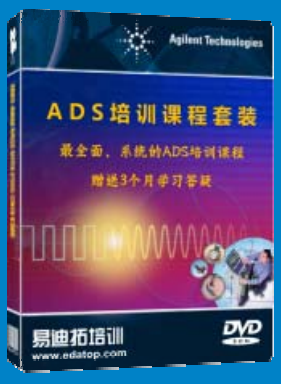


HFSS 学习培训课程套装

该套课程套装包含了本站全部 HFSS 培训课程，是迄今国内最全面、最专业的 HFSS 培训教程套装，可以帮助您从零开始，全面深入学习 HFSS 的各项功能和在多个方面的工程应用。购买套装，更可超值赠送 3 个月免费学习答疑，随时解答您学习过程中遇到的棘手问题，让您的 HFSS 学习更加轻松顺畅…

课程网址：http://www.edatop.com/peixun/hfss/11.html

ADS 学习培训课程套装



该套装是迄今国内最全面、最权威的 ADS 培训教程，共包含 10 门 ADS 学习培训课程。课程是由具有多年 ADS 使用经验的微波射频与通信系统设计领域资深专家讲解，并多结合设计实例，由浅入深、详细而又全面地讲解了 ADS 在微波射频电路设计、通信系统设计和电磁仿真设计方面的内容。能让您在最短的时间内学会使用 ADS，迅速提升个人技术能力，把 ADS 真正应用到实际研发工作中去，成为 ADS 设计专家...

课程网址： http://www.edatop.com/peixun/ads/13.html

我们的课程优势：

※ 成立于 2004 年，10 多年丰富的行业经验，

※ 一直致力并专注于微波射频和天线设计工程师的培养，更了解该行业对人才的要求

※ 经验丰富的一线资深工程师讲授，结合实际工程案例，直观、实用、易学

联系我们：

※ 易迪拓培训官网：http://www.edatop.com

※ 微波 EDA 网：http://www.mweda.com

※ 官方淘宝店：http://shop36920890.taobao.com