



モバイルコンピューティング推進コンソーシアム
Mobile Computing Promotion Consortium

MCPC-TR008

**Bluetooth Multi-Connection
Technical Reference**

Version 1.1 Japanese

2009年3月25日

**モバイルコンピューティング推進コンソーシアム
技術委員会**

Mobile Computing Promotion Consortium

History / 変更履歴

日付	Version	変更内容
2008年 9月11日	1.00	Base version initial release.
2008年12月23日	1.00 R01	SIG Feedback 反映
2009年 3月25日	1.1	Terms and AbbreviationsへのCT、TG追記 4.2.7、4.3.7追加 7章にAppendix C (Halt Streaming) 追加 1.2章、5章Appendix Aに英訳追記

ドキュメント発行者、および著作権者:

〒105-0011

東京都港区芝公園3-5-12 芝公園真田ビル

モバイルコンピューティング推進コンソーシアム (MCPC)

電話: 03-5401-1935

FAX: 03-5401-1937

E MAIL: office@mcpc-jp.org

WEB SITE: <http://www.mcpc-jp.org>

機密保持について:

MCPC会則、MCPC IP Policyを遵守

免責について:

本ドキュメントはモバイルコンピューティングに関する標準仕様、推奨仕様などを提供するもので、モバイルコンピューティング推進コンソーシアム(以下MCPCとする)は、本ドキュメントを使用した結果発生した損害、第三者の特許、またはその他の権利の侵害に対して、一切の責任を負わない。また、本ドキュメントはMCPC、または第三者が保持するいかなる権利のライセンスを許諾するものではない。

Contributors

Masashi Miura	DENSO CORPORATION
Akio Konishi	FUJITSU ELECTRONICS INC.,
Masahiko Nakashima	FUJITSU ELECTRONICS INC.,
Masashi Takada	Hitachi, Ltd.
Masamitsu Miyazaki	Hitachi, Ltd.
Naoki Shimizu	mitsubishi electric corporation
Riko Yagiu	mitsubishi electric corporation
Tomoyuki Suzuki	NISSAN MOTOR CO., LTD. for JAMA
Masahiko Seki	Sony Corporation
Mitsuyoshi Yasuda	Sony Ericsson Mobile Communications Japan
Hiroshi Matsuya	TOSHIBA CORPORATION
Makoto Yamashita	TOSHIBA CORPORATION
Shuichi Sakurai	TOSHIBA CORPORATION
Toshiya Tamura	TOSHIBA CORPORATION

MCPC Bluetooth Audio Sub Working Group Member Company (Alphabetical Order)

AISIN AW CO.,LTD.
ALPINE ELECTRONICS, INC
ALPS ELECTRIC CO., LTD.
CSR Ltd.
Clarion Co., Ltd.
DENSO CORPORATION
FUJITSU ELECTRONICS INC.,
FUJITSU LIMITED
FUJITSU TEN LIMITED
HARMAN / BECKER AUTOMOTIVE SYSTEMS
Hitachi, Ltd.
mitsubishi electric corporation
mitsumi electric co., ltd.
Murata Manufacturing Co., Ltd.
NEC Corporation
NISSAN MOTOR CO., LTD. for JAMA
NTT DoCoMo, Inc.
Renesas Technology Corp.
SEIKO EPSON CORPORATION
SHARP CORPORATION
SOFTBANK MOBILE Corp.
Sony Corporation
Sony Ericsson Mobile Communications Japan
TAIYO YUDEN CO., LTD.
TOSHIBA CORPORATION

Table of Contents

1. Introduction / 概要	8
1.1 Scope	8
1.2 System.....	9
1.3 Role Switch.....	10
2. Document Terminology	10
3. Basic Condition	11
3.1 Configuration and Roles	11
3.1.1 Audio Gateway with Gateway (AG_GW).....	11
3.1.1.1 Recommendation.....	11
3.1.1.2 Motivation	11
3.1.2 HandsFree with Data Terminal (HF_DT)	11
3.1.2.1 Recommendation.....	11
3.1.2.2 Motivation	11
3.1.3 Media Player (MP)	11
3.1.3.1 Recommendation.....	11
3.1.3.2 Motivation	11
3.1.4 Rendering Device (RD)	12
3.1.4.1 Recommendation.....	12
3.1.4.2 Motivation	12
3.1.5 Remote Controller (RC)	12
3.1.5.1 Recommendation.....	12
3.1.5.2 Motivation	12
3.1.6 Audio Gateway with Media Player and Gateway (AG_MP_GW)	12
3.1.6.1 Recommendation.....	12
3.1.6.2 Motivation	12
3.1.7 Handsfree with Rendering Device and Data Terminal (HF_RD_DT)	13
3.1.7.1 Recommendation.....	13
3.1.7.2 Motivation	13
3.2 Profile Architecture	13
4. SCENARIOS	15
4.1 Use Cases for HFP + DUN.....	15
4.1.1 HFP+DUN; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL	15
4.1.1.1 Pre-Conditions	15
4.1.1.2 User Action	15
4.1.1.3 Post Conditions.....	15
4.1.1.4 Recommendation.....	15
4.1.1.5 Message Sequence Charts.....	16
4.1.2 HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL	17
4.1.2.1 Pre-Conditions	17
4.1.2.2 User Action	17
4.1.2.3 Post Conditions.....	17
4.1.2.4 Recommendation.....	17
4.1.2.5 Message Sequence Charts.....	18
4.1.3 HFP+DUN;OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT- SWITCHED DATA MODE	19
4.1.3.1 Pre-Conditions	19

4.1.3.2 User Action	19
4.1.3.3 Post Conditions.....	19
4.1.3.4 Recommendation.....	19
4.1.3.5 Message Sequence Charts.....	20
4.2 Use Cases for HFP+A2DP/VDP+AVRCP+DUN WITH SAME DEVICE	21
4.2.1 HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.....	21
4.2.1.1 Pre-Conditions	21
4.2.1.2 User Action	21
4.2.1.3 Post Conditions.....	21
4.2.1.4 Recommendation.....	21
4.2.1.5 Message Sequence Charts.....	22
4.2.2 HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.	24
4.2.2.1 Pre-Conditions	24
4.2.2.2 User Action	24
4.2.2.3 Post Conditions.....	24
4.2.2.4 Recommendation.....	24
4.2.2.5 Message Sequence Charts.....	25
4.2.3 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL UNDER PACKET-SWITCHED DATA MODE	27
4.2.4 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE AND LISTENING TO MUSIC FROM A SAME DEVICE... ..	27
4.2.5 HFP+A2DP/VDP+AVRCP+DUN ; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE	28
4.2.5.1 Pre-Conditions	28
4.2.5.2 User Action	28
4.2.5.3 Post Conditions.....	28
4.2.5.4 Recommendation.....	28
4.2.5.5 Message Sequence Charts.....	29
4.2.6 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE	30
4.2.6.1 Pre-Conditions	30
4.2.6.2 User Action	30
4.2.6.3 Post Conditions.....	30
4.2.6.4 Recommendation.....	30
4.2.6.5 Message Sequence Charts.....	31
4.2.7 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE.....	32
4.2.7.1 Pre-Conditions	32
4.2.7.2 User Action	32
4.2.7.3 Post Conditions.....	32
4.2.7.4 Recommendation.....	32
4.2.7.5 Message Sequence Charts.....	33
4.3 Use Cases for HFP+A2DP/VDP+AVRCP+DUN WITH THE THIRD DEVICE	34
4.3.1 HFP+A2DP/VDP+AVRCP+DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC FROM THE THIRD DEVICE.....	34
4.3.2 HFP+A2DP/VDP+AVRCP+DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC FROM THE THIRD DEVICE.....	34
4.3.3 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE	34
4.3.4 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE AND LISTENING TO MUSIC FROM THE THIRD DEVICE	35

4.3.5 HFP-A2DP/VDP-AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE	35
4.3.6 HFP + A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE(IN CASE OF THE THIRD DEVICE)	35
4.3.7 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE (IN CASE OF THE THIRD DEVICE).....	36
4.3.7.1 Pre-Conditions	36
4.3.7.2 User Action	36
4.3.7.3 Post Conditions.....	36
4.3.7.4 Recommendation.....	36
4.3.7.5 Message Sequence Charts.....	37
5. Appendix A (Multi Connection use cases).....	38
6. Appendix B (実装上の注意事項)	40
7. Appendix C (HALT STREAMING Sub-scenarios)	41
8. LIST OF FIGURES	42
9. LIST OF TABLES	43

Terms and Abbreviations

A2DP	Advanced Audio Distribution Profile
AG	Audio Gateway (as in HFP)
AG_MP	Audio Gateway and Media Player
AG_MP_GW	Audio Gateway with Media Player and Gateway
AVDTP	Audio/Video Distribution Protocol
AVRCP	Audio Video Remote Control Profile
CSDM	Circuit Switched Data Mode (Data communication over Circuit switched bearer service)
CT	Controller (as in AVRCP)
DT	Data Terminal (as in DUN)
DUN	Dial-Up Networking Profile
GAVDP	Generic Audio/Video Distribution Profile
GW	Gateway (as in DUN)
HF	HandsFree (as in HFP)
HFP	HandsFree Profile
HF_RD	HandsFree and Rendering Device
HF_RD_DT	HandsFree with Rendering Device and Data Terminal
HQ ringing tone	Any audio using A2DP for ringing
MP	Media Player
NA	Not Applicable
PSDM	Packet-Switched data mode (Data communication over Packet switched bearer service)
RC	Remote Controller
RD	Rendering Device
SNK	Sink (as in A2DP/VDP)
SRC	Source (as in A2DP/VDP)
TG	Target (as in AVRCP)
UI	User Interface (Some possibility for the user to interact with the system. Can be just some buttons or a more complex UI may be e.g. a display with keyboard or touch screen.)
VDP	Video Distribution Profile

1. Introduction / 概要

1.1 Scope

このドキュメントは、Bluetooth SIG発行のSimultaneous Use of HFP, A2DP and AVRCP_WP [9]を元に作成され、どのようにしてA2DPとAVRCPが一緒に使用されなければならないか、また、プロファイルの中で定義された全ての機能の中で、高い相互接続性を達成するために、A2DPとAVRCPが、他のプロファイル(特にこのドキュメントではHFPとDUN)とどのようにして一緒に使用しなければならないかを記述する。本ドキュメントで定義されているシナリオおよびシーケンスは必須ではないが、推奨されるものである。

このドキュメントでは、各ユースケースに直接関係のあるプロファイルの動作に関してのみ記載する。動作記載の無いプロファイルの使用は可能だが、接続の有無や動作ステータスは各社の実装に依存するものとする。例えば、4.2.1のケースではAVRCPは動作に直接関係しないので記載していないが、両機がAVRCPをサポートしている場合は、接続されていることを前提とする。

[注意]

本ドキュメントは、その内容を強制するものではなく、Bluetooth[®]の権利を侵害するものではない。またその利用に関しては、利用者の責任において実施されるものとする。MCPCは本ドキュメントに関する法的侵害、市場性、またあるいは特定の目的に対する整合性を含むいかなる明示的、または暗示的保証をしない。

1.2 System

The following Figure 1.1 and Figure 1.2 shows example of system configuration defined by this technical reference. In this document, Third Device Scenario is defined as the connection type drawn in Figure 1.1 .also Same device Scenario is defined in Figure1.2.

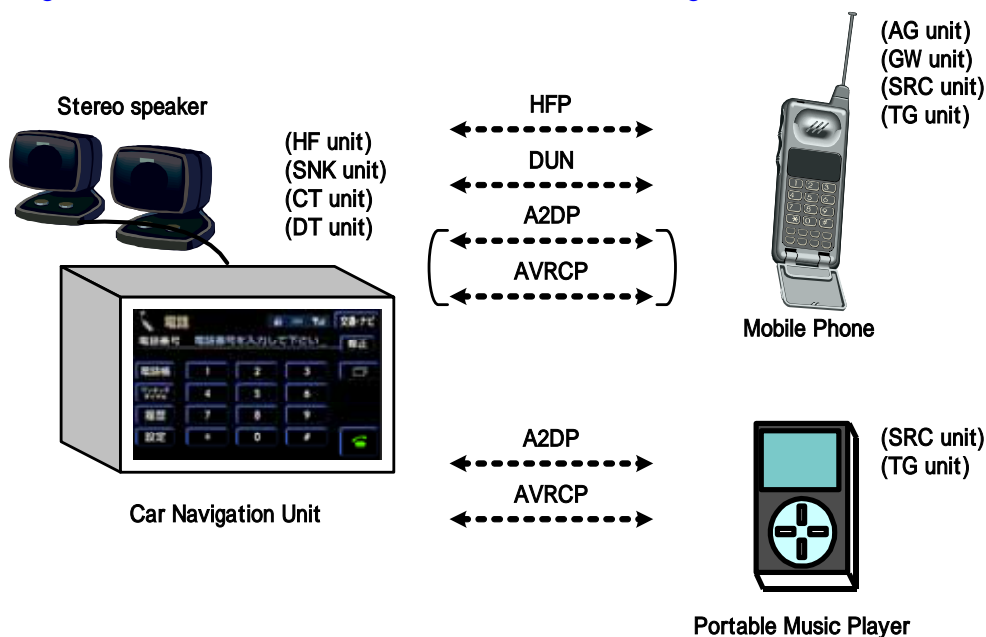


Figure 1.1 example system configuration Case 1 (Third Device Scenario)

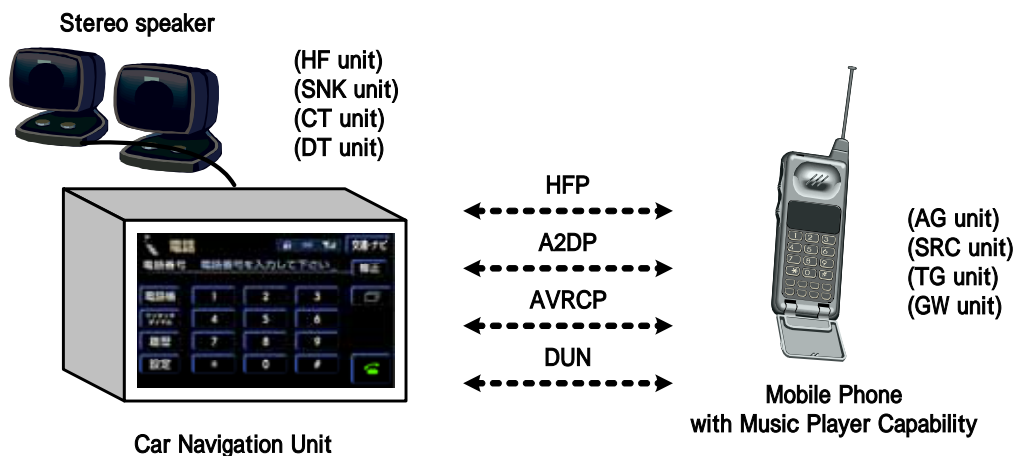


Figure 1.2 example system configuration Case 2 (Same Device Scenario)

1.3 Role Switch

頻繁なRole切り替えの回避や、マルチ接続時に通信帯域を有効に活用するため、現在の接続状態において、自機のRoleをMasterあるいはSlaveに固定すべきではなく、どちらで動作しても問題ない場合は、接続相手機器からのRoleスイッチ切り替え要求を受け入れることが望ましい。

2. Document Terminology

- ・することができる
してもよい
(may) 推奨または要求に自由な選択肢を示す。
- ・すべきである
(should) 必須ではないが強い推奨を示す。実施の際、必須ではないが考慮すべき。
- ・しなければならない
(shall) 必須要求を示す。接続性、仕様準拠のために必ず実施しなければならない。

3. Basic Condition

3.1 Configuration and Roles

3.1.1 Audio Gateway with Gateway (AG_GW)

HFPに規定されるAGと、DUNに規定されるGWの両方の機能を併せ持つ機器であり、公衆網にアクセス可能な機器。代表的なものは携帯電話。

3.1.1.1 Recommendation

AG_GWは以下のRoleに対応する。

- HFP AG
- DUN GW

3.1.1.2 Motivation

AG_GWはHFP AGとDUN GWの両方の機能に対応することにより、公衆網とHF/DTとの間で音声/データ通信を可能とする。音声/データ通信共に、同時使用できることが望ましい。同時使用できない場合には、各機能を切り替えて使用する。

3.1.2 HandsFree with Data Terminal (HF_DT)

HFPに規定されるHFと、DUNに規定されるDTの両方のRoleを併せ持つ機器。代表的なものは車載機。

3.1.2.1 Recommendation

HF_DTは以下のRoleに対応する。

- HFP HF
- DUN DT

3.1.2.2 Motivation

HF_DTはHFP HFとDUN DTの両方の機能に対応することにより、AG_GWとの間で音声/データ通信を可能とする。音声/データ通信は、同時に使用可能であること。

3.1.3 Media Player (MP)

メディアプレーヤーには、ポータブルメディアプレーヤー(MP3プレーヤー、ビデオプレーヤー、携帯電話)または据え置き型のメディアプレーヤー(ホームオーディオ/ビデオシステム、カーオーディオ/ビデオシステム)がある。

3.1.3.1 Recommendation

メディアプレーヤーは以下のRoleに対応する。

- A2DP SRCとVDP SRCの両方、またはどちらか一方
- AVRCP1.3 TG、category 1に対応し、少なくともPlay StatusとPLAY/PAUSE / STOP コマンドをサポートする
- A2DP SRCに対応している場合は、AVRCP CT、category 2に対応し、少なくともボリュームUP/DOWNコマンドをサポートする
- A2DP SRCに対応している場合は、AVRCP TG category2に対応し、少なくともボリュームUP/DOWNコマンドをサポートする。

3.1.3.2 Motivation

MPはSNKデバイスへオーディオ/ビデオのストリーミングを行うため、A2DP/VDP SRCのRoleをサポートする。また、RDまたはRCからのPLAY、STOPやその他のコマンドを受信するためにAVRCP TGのRoleをサポートする。なお、MPはRDに、ボリュームアップ/ダウンコマンドを送信するためにAVRCP CTもサポートする。

全てのRDがローカルボリュームコントロール機能を持っているとは限らず、またユーザーの近くに設置されていないスピーカーのようなRDをMPからボリュームコントロールするために、上記推奨の3番目の項目が重要である。MPがAVRCP TG category2になる理由は、RCがMPに接続してボリュームUP/DOWNコマンドを送信可能とするためである。

3.1.4 Rendering Device (RD)

RDには、ヘッドホン、スピーカ、カーオーディオ、オプションオーディオ機能付きビデオディスプレイなどのデバイスがある。

3.1.4.1 Recommendation

RDは、以下のRoleに対応する。

- A2DP SNKとVDP SNKの両方、またはどちらか一方
- A2DP SNKに対応する場合はAVRCP1.3 TG、Category 2 に対応し、少なくともVolume Up/Downコマンドをサポートする。
- AVRCP1.3 CT、Category 1 に対応し、少なくともPLAY/PAUSE/STOP、GetPlayStatus コマンドとEVENT_PLAYBACK_STATUS_CHANGED notificationをサポートする。

3.1.4.2 Motivation

RDはMPからオーディオを受信する為にA2DP SNKに対応し、MPとの間でPLAY、PAUSE、STOP、Forward、Backward、GetPlayStatus コマンドを送信する為にAVRCP CTに対応する。EVENT_PLAYBACK_STATUS_CHANGED notificationは、RDがMediaPlayerの再生状態を認識するために使用される。

さらにMPがAVRCPボリュームUP/Downコマンドを送ることにより、RDのボリュームを変えられるようにする為、RDはAVRCP TGに対応する。

ユーザ操作(例えばホームオーディオ・スピーカー)が出来無いRDは、AVRCP CTをサポートする必要はない。

3.1.5 Remote Controller (RC)

RCはリモートコントローラーの機能を持った機器であるが、他の機能を合わせ持った機器もある。

3.1.5.1 Recommendation

RCは以下の機能に対応する

- AVRCP1.3 CTのカテゴリー1に対応し、少なくともPLAY、PAUSE、STOP、GetPlayStatusコマンドとEVENT_PLAYBACK_STATUS_CHANGED notificationに対応する。
- AVRCP CT category2に対応し、ボリュームUP/DOWNコマンドをサポートする。

3.1.5.2 Motivation

RCは、ボリュームアップダウン、PLAY、STOP、PAUSEやその他のコマンドをMPに送信するために、AVRCPのCTに対応する。EVENT_PLAYBACK_STATUS_CHANGED notificationは、RCがMediaPlayerの再生状態を認識するために使用される。

3.1.6 Audio Gateway with Media Player and Gateway (AG_MP_GW)

MP(3.1.3参照)と、HFPに規定されるAGと、DUNに規定されるGWの機能を併せ持つ機器である。代表的なものは携帯電話。

3.1.6.1 Recommendation

3.1.1.1および3.1.3.1と同様である。

3.1.6.2 Motivation

3.1.1.2および3.1.3.2と同様である。

3.1.7 Handsfree with Rendering Device and Data Terminal (HF_RD_DT)

RD(3.1.4参照)と、HFPに規定されるHFと、DUNに規定されるDTの機能を併せ持つ機器。代表的なものは車載機。

3.1.7.1 Recommendation

3.1.2.1および3.1.4.1と同様である。

3.1.7.2 Motivation

3.1.2.2および3.1.4.2と同様である。

3.2 Profile Architecture

Bluetooth SIGのAudio/Videoに関するプロファイル・プロトコルとしては以下が規定されている。

・ストリーミング系プロファイル、プロトコル

Profile		Protocol
A2DP (Advanced Audio Distribution Profile)	GAVDP (Generic Audio/Video Distribution Profile)	AVDTP (Audio/Video Distribution Transport Protocol)
VDP (Video Distribution Profile)		

・コントロール系プロファイル、プロトコル

Profile	Protocol
AVRCP (Audio/Video Remote Control Profile)	AVCTP (Audio/Video Control Transport Protocol)

個々のプロファイルは規格書が個別に存在するが、ストリーミング系プロファイルとコントロール系プロファイルの組み合わせ動作については規格書中に明確な規定がない。

これらのプロファイルを実装しようとする場合は、まず、それぞれの規格書を参照する事が不可欠であり、それを理解した上で、本ガイドラインを参照する必要がある。

ストリーミング系の上位プロファイルでオーディオストリーミングに用いられるA2DPIは、GAVDPの上位に位置しAVDTPコマンドと共に用いられ、Bluetoothのリンク上でハイクオリティなステレオやモノラルの音声信号の伝播を実現する事を目的に策定されている。これらのプロファイル/プロトコルでは、音声信号伝播経路のセットアップ・確立・開放等の制御を目的とした機能を規定しており、AV機器のリモートコントロールを行う機能は含まれていない。よってストリーミング系プロファイルでは、AV機器の動作および状態変化を期待しているのではなく、あくまでBluetoothのリンク上での音声信号伝播経路の制御を目的としているという事を認識する必要がある。

コントロール系プロファイルのAVRCPはAVCTPと共に用いられ、その名の通り”AV機器のリモートコントロールを実現する”プロファイルである。このプロファイルを用いて、コマンド送信側機器はコマンド受信側機器に対し、伝送したコマンドの意図する動作・状態変化および情報交換を期待する。

基本的な考え方は各仕様書の1.1 Scopeに記載されている通りである。

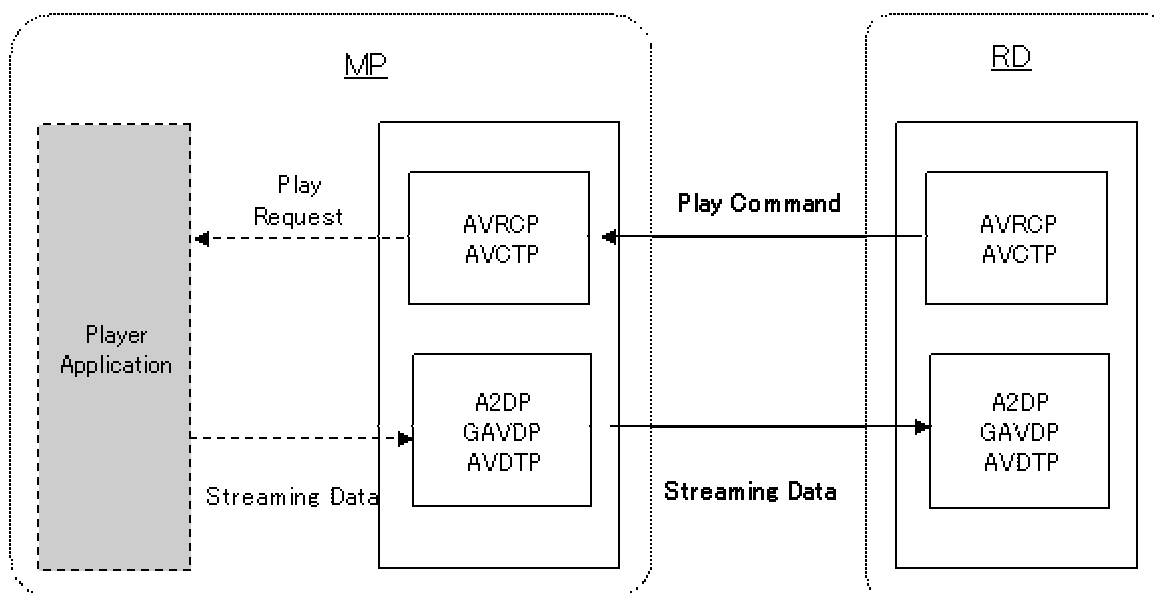


Figure 3.2 Example of command procedure

Figure3.2は、RDからのAVRCP Playコマンドを受信したMPが、ストリーミングデータを転送する場合の一例である。AVRCP Playコマンドを受信したMPがストリーミングデータ転送を開始するかどうかは、プロファイル仕様に規定が無くアプリケーションの実装依存であるため、全てのMPが上記一例に当てはまるとは限らない。これらの動作規定を補完するために本書が存在する

4. SCENARIOS

4.1 Use Cases for HFP + DUN

4.1.1 HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL

4.1.1.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	HF_DT	AG_GW
DUN connection established with	[HF_DT]	[AG_GW]
DUN (PACKET-SWITCHED DATA MODE) State	N/A	N/A

Table 4.1.1.1: Pre-conditions: HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL.

Note: [] means that the connection is optional.

4.1.1.2 User Action

User turns on DUN functionality on the HF_DT system.

4.1.1.3 Post Conditions

In the table below the Post Conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	HF_DT	AG_GW
DUN connection established with	HF_DT	AG_GW
DUN (PACKET-SWITCHED DATA MODE) State	Data Communication	Data Communication

Table 4.1.1.2: Post-Conditions: HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL.

4.1.1.4 Recommendation

The recommendation is to set SCO or eSCO Packet type to HV3 or EV3/2-EV3 as default.

If AG requests HV1 when SCO is established, it is recommended that HF requests HV3. However, if AG supports only HV1, HF shall accept HV1. In this case simultaneous use of HFP voice communication and DUN data communication is not possible.

4.1.1.5 Message Sequence Charts

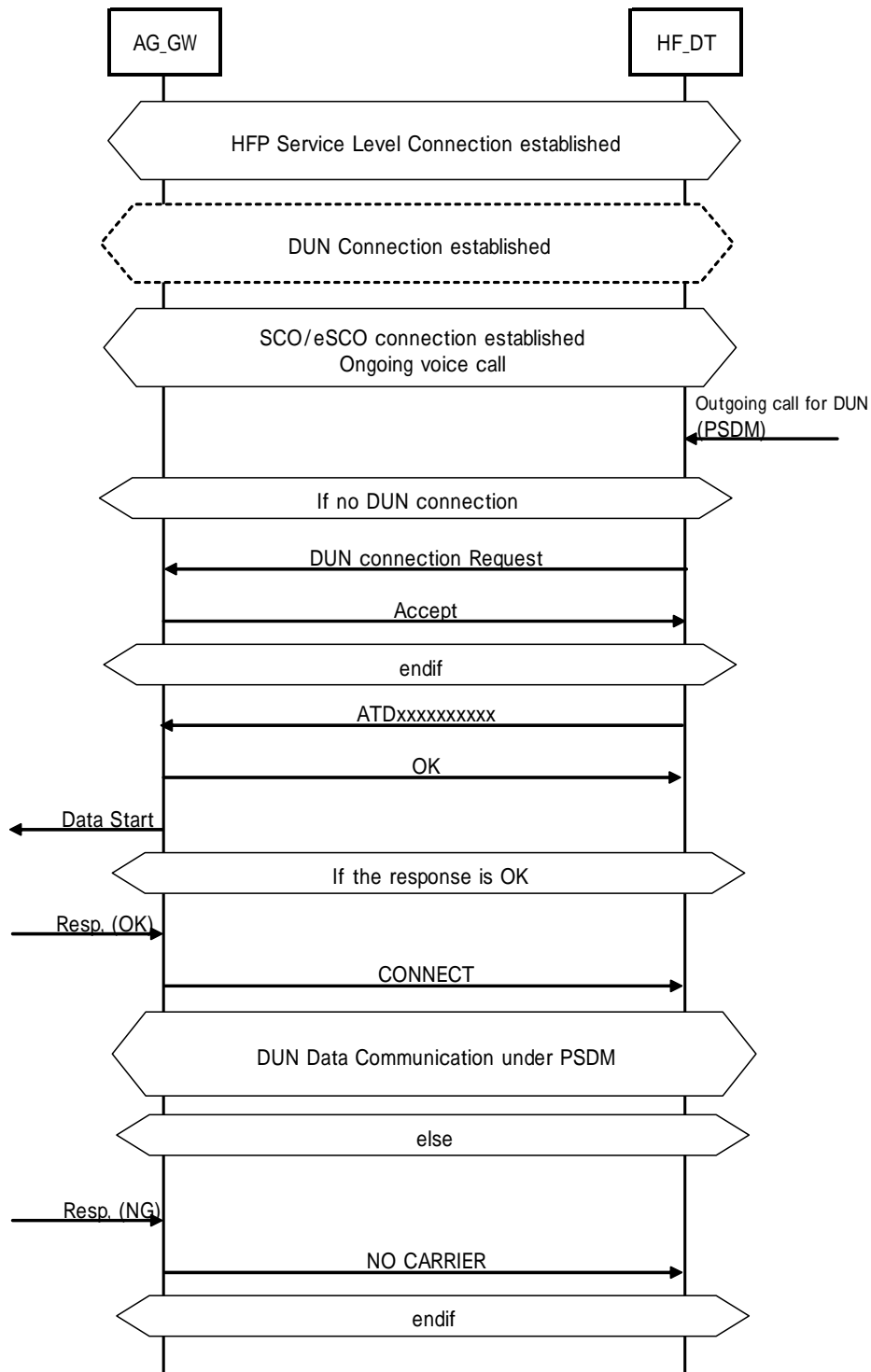


Figure 4.1.1.5 HFP+DUN; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL.

Note: Throughput of DUN might be goes down in this case.

4.1.2 HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL .

4.1.2.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	HF_DT	AG_GW
DUN connection established with	[HF_DT]	[AG_GW]
DUN (CIRCUIT-SWITCHED DATA MODE) State	N/A	N/A

Table 4.1.2.1: Pre-Conditions: HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP.

Note: [] means that the connection is optional.

4.1.2.2 User Action

User terminates the phone-call before user turns on DUN functionality on the HF_DT system.

4.1.2.3 Post Conditions

In the table below the Post Conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	-	-
DUN connection established with	HF_DT	AG_GW
DUN (CIRCUIT-SWITCHED DATA MODE) State	Data Communication	Data Communication

Table 4.1.2.3: Post-Conditions: HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP.

4.1.2.4 Recommendation

Under the Circuit-Switched data mode, it is impossible to use both HFP and DUN at the same time. Therefore voice call should be terminated to start DUN communication.

4.1.2.5 Message Sequence Charts

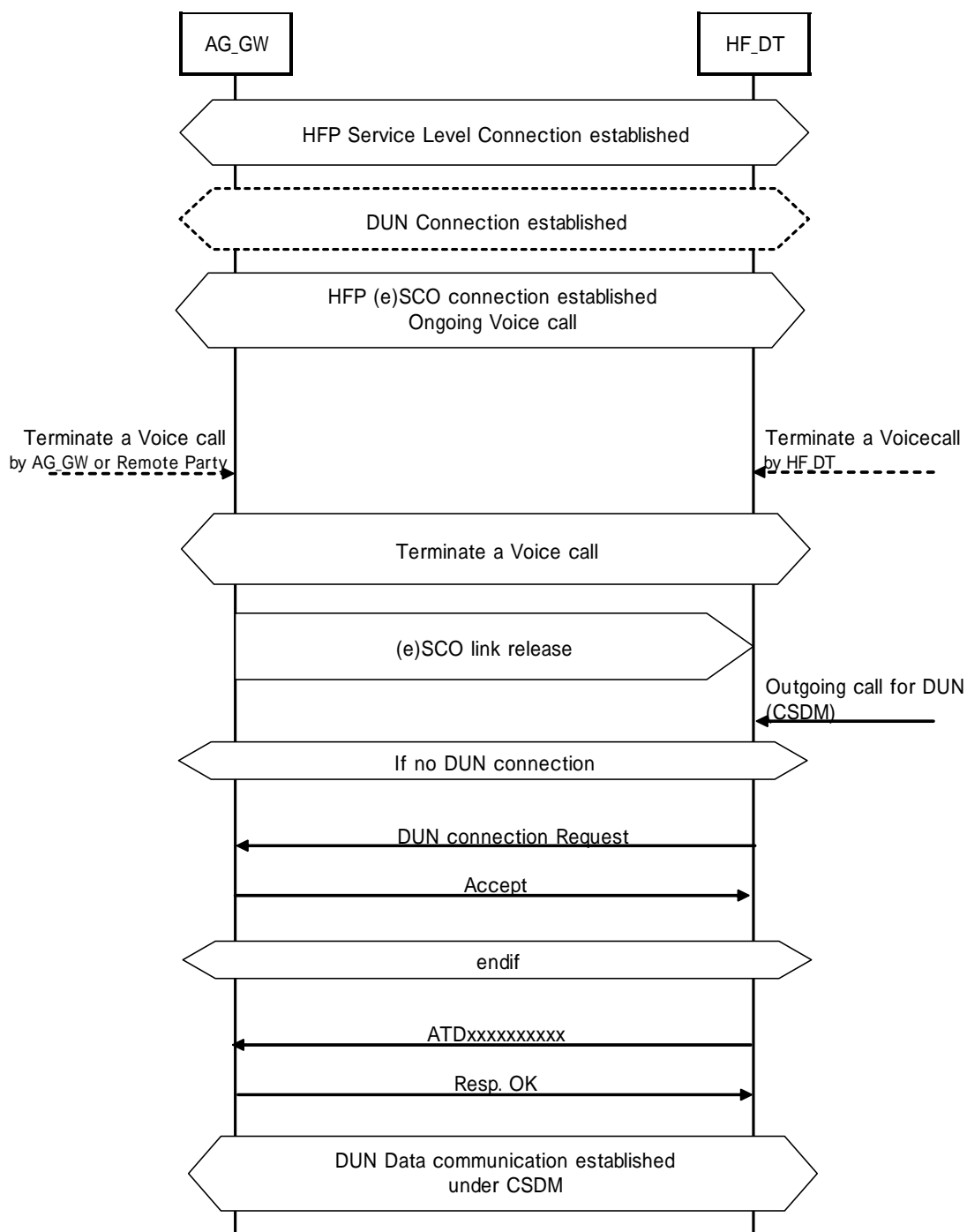


Figure 4.1.2.5 HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP

Information : Under CIRCUIT-SWITCHED DATA MODE, dashed lines should be handled by Application layer of HF_DT / AG_GW.

4.1.3 HFP+DUN;OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.1.3.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	-	-
DUN connection established with	HF_DT	AG_GW
DUN(CIRCUIT-SWITCHED DATA MODE) State	Data communication	Data communication

Table 4.1.3.1: Pre-Conditions: HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.1.3.2 User Action

User initiates a voice call during DUN data communication under CIRCUIT-SWITCHED DATA MODE.

4.1.3.3 Post Conditions

In the table below the Post Conditions for this scenario are listed.

Device	AG_GW	HF_DT
Paired with	HF_DT	AG_GW
HFP service level connection established with	HF_DT	AG_GW
HFP SCO Connection established with	HF_DT	AG_GW
DUN connection established with	HF_DT	AG_GW
DUN(CIRCUIT-SWITCHED DATA MODE) State	N/A	N/A

Table 4.1.3.3:Post-Conditions: HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.1.3.4 Recommendation

Under the CIRCUIT-SWITCHED DATA MODE, it is impossible to make a phone call at the same time.

It is recommended to provide a way of terminating an ongoing data connection on HF_DT (by menu, button and so on) in case user wants to make a outgoing voice call.

HF_DT should not initiate outgoing call while DUN data communication is under CIRCUIT-SWITCHED DATA MODE because the application layer of HF_DT knows that DUN is under CIRCUIT-SWITCHED DATA MODE.

4.1.3.5 Message Sequence Charts

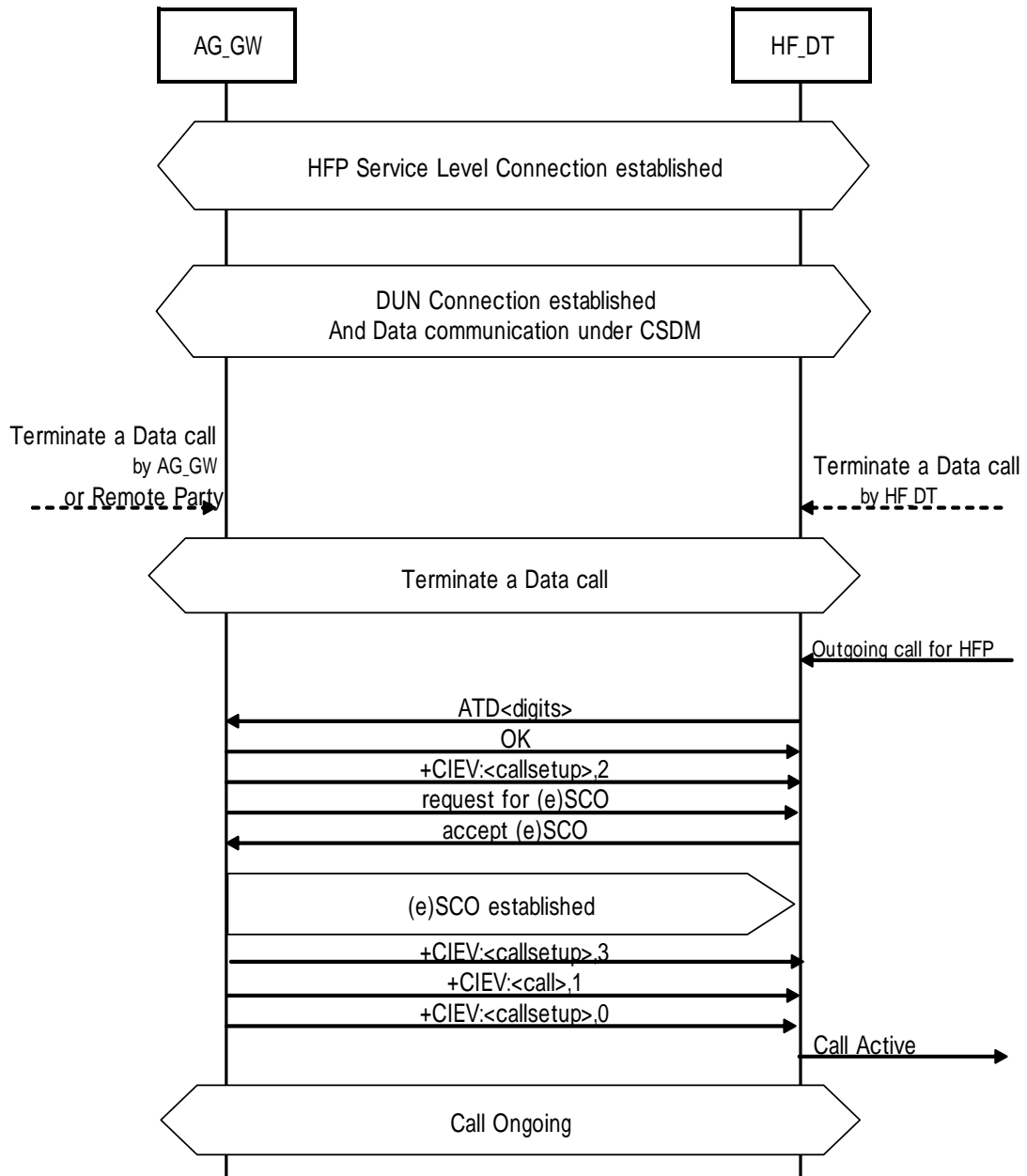


Figure 4.1.3.5. HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE (User initiates a voice call on HF_DT)

4.2 Use Cases for HFP+A2DP/VDP+AVRCP+DUN WITH SAME DEVICE

4.2.1 HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

4.2.1.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
HFP service level connection established with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State	STREAMING	STREAMING
DUN connection established with	[HF_RD_DT]	[AG_MP_GW]
DUN (PACKET-SWITCHED DATA MODE) State	N/A	N/A

Table 4.2.1.1: Pre-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

Note: [] means that the connection is optional.

4.2.1.2 User Action

User turns on DUN functionality on HF_RD_DT system.

4.2.1.3 Post Conditions

In the table below the Post conditions for this scenario are listed.

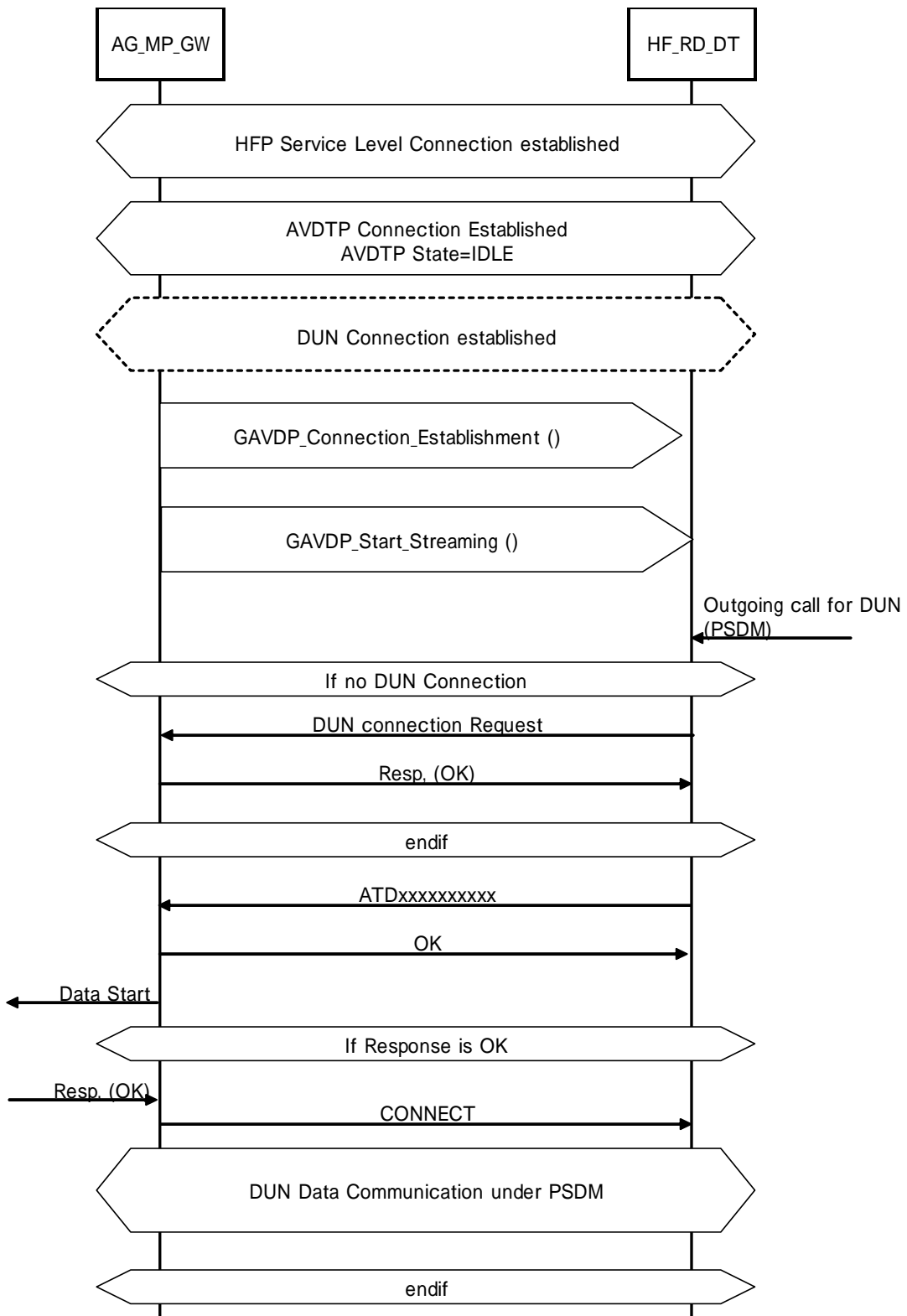
Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
HFP service level connection established with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State	STREAMING	STREAMING
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (PACKET-SWITCHED DATA MODE) State	Data communication	Data communication

Table 4.2.1.3: Post-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC

4.2.1.4 Recommendation

The recommendation is to support V.2.0 + EDR or later version for this scenario on both AG_MP_GW and HF_RD_DT system to keep enough band width.

4.2.1.5 Message Sequence Charts



(Continued)

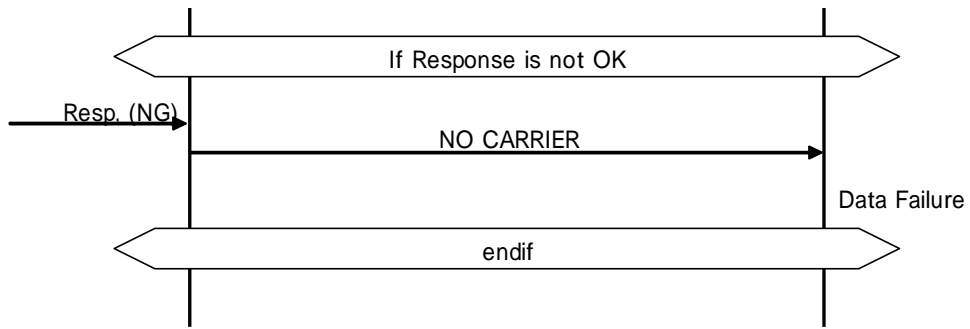


Figure 4.2.1.5. HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC

4.2.2 HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

4.2.2.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
HFP service level connection established with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State	STREAMING	STREAMING
DUN connection established with	[HF_RD_DT]	[AG_MP_GW]
DUN(CIRCUIT-SWITCHED DATA MODE) State	N/A	N/A

Table 4.2.2.1: Pre-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

Note: [] means that the connection is optional.

4.2.2.2 User Action

User turns on DUN functionality on HF_RD_DT system.

4.2.2.3 Post Conditions

In the table below the Post conditions for this scenario are listed.

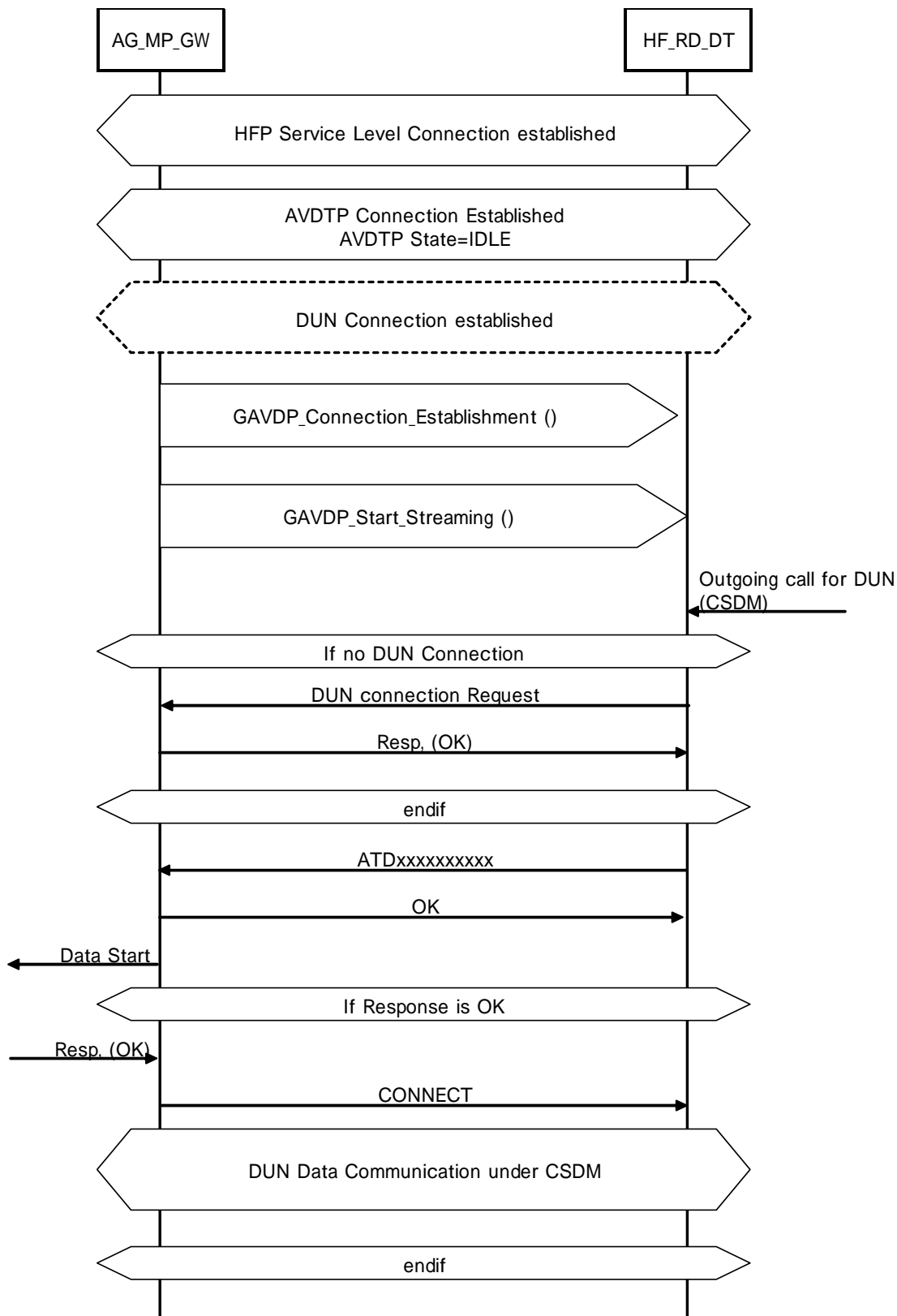
Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
HFP service level connection established with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State	STREAMING	STREAMING
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN(CIRCUIT-SWITCHED DATA MODE) State	Data communication	Data communication

Table 4.2.2.3: Post-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

4.2.2.4 Recommendation

The recommendation is to support V.2.0 + EDR or later version for this scenario on both AG_MP_GW and HF_RD_DT system, at least.

4.2.2.5 Message Sequence Charts



(Continued)

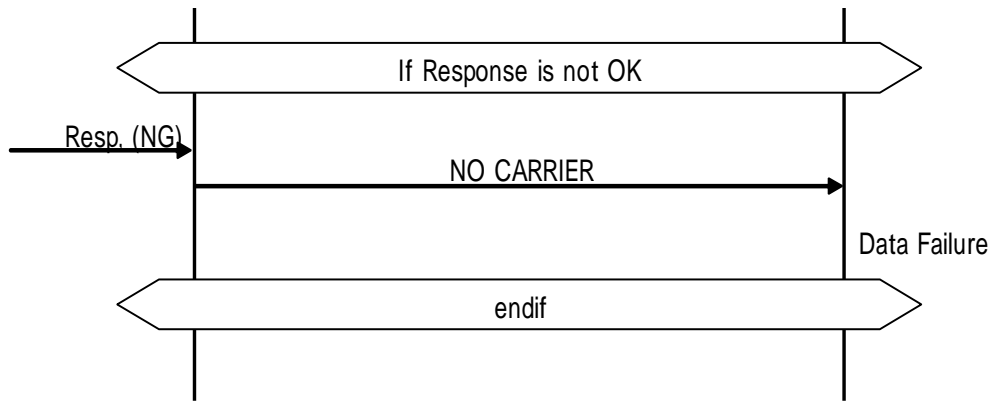


Figure 4.2.2.5. HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

4.2.3 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL UNDER PACKET-SWITCHED DATA MODE

Refer to 4.13 Answer an Incoming Call of HFP1.5.

Note: DUN Packet-Switched Data 通信中かつSameDeviceとのA2DP Idle状態で着信しても、DUN、A2DPには影響を与えず、DUN/A2DP両ProfileのStateに変化はない。
また通話とデータ通信が同時使用できない網の場合、着信中または通話中はデータ通信はSuspendされるが、DUNのConnectionは維持される。
従って、HFP動作はHFP 1.5 Specの4.13 Answer an Incoming Callが参照される。

4.2.4 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE AND LISTENING TO MUSIC FROM A SAME DEVICE

Refer to “ 6.2.5 HFP+A2DP/VDP+AVRCP INCOMING CALL WHEN LISTENING TO MUSIC FROM THE SAME DEVICE, NO HQ RING SIGNAL“ in the document of “SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES” published by Bluetooth SIG.

Note: DUN Packet-Switched Data 通信中かつSameDeviceとのA2DP Streaming中に着信しても、DUNには影響を与えず、DUNのStateに変化はなく動作は継続される。
また通話とデータ通信が同時使用できない網の場合、着信中または通話中はデータ通信はSuspendされるが、DUNのConnectionは維持される。従ってHFPの着信により影響を受けるのはA2DPであり、Steamingを中断、再開する手順はWhite Paperが参照される。

4.2.5 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE

4.2.5.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State	IDLE	IDLE
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (PACKET-SWITCHED DATA MODE) State	Data communication	Data communication
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	-	-

Table 4.2.5.1: Pre-Conditions:HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE.

4.2.5.2 User Action

User initiates a voice call or selects “Outgoing call” on HF_RD_DT while DUN No Data/Data communication is ongoing under PACKET-SWITCHED DATA MODE. And starting phone call.

4.2.5.3 Post Conditions

In the table below the post-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State during call	IDLE	IDLE
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (PACKET-SWITCHED DATA MODE) State	Data communication	Data communication
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	HF_RD_DT	AG_MP_GW

Table 4.2.5.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE.

4.2.5.4 Recommendation

The recommendation is to set SCO or eSCO Packet type to HV3 or EV3/2-EV3 as default.

If AG requests HV1 when SCO is established, it is recommended that HF requests HV3. However, if AG supports only HV1, HF shall accept HV1 and recognize that multi-connection is not available in this case.

4.2.5.5 Message Sequence Charts

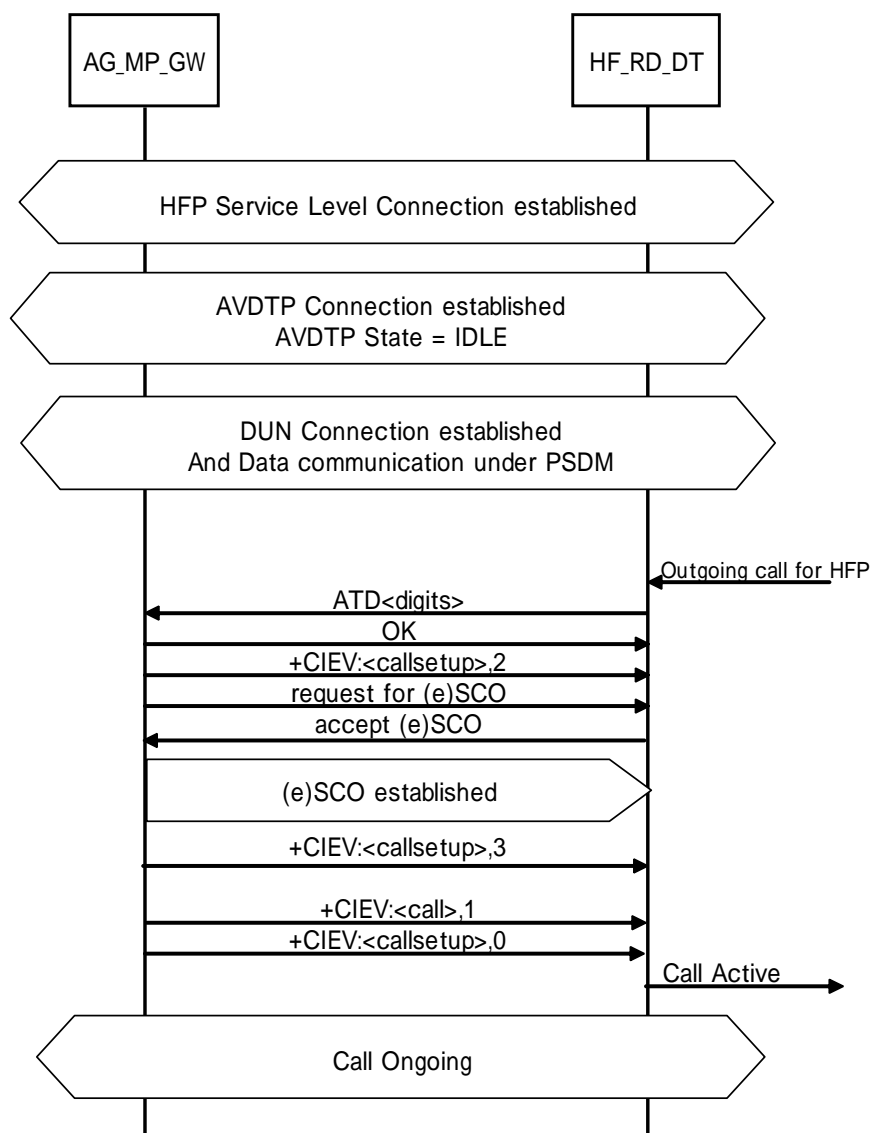


Figure 4.2.5.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE. (User initiates a voice call on HF_RD_DT)

Note: 本ガイドラインはパケットデータ通信中の発呼が可能な携帯網での実装をもとに作成したものである。網側の仕様によりパケットデータ通信中の発呼が不可能で、ATDに対してErrorが返ってくる場合のHFデバイス側での処理は実装依存である。

4.2.6 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.2.6.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State during call	IDLE	IDLE
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (CIRCUIT-SWITCHED DATA MODE) State	Data communication	Data communication
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	-	-

Table 4.2.6.1: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.2.6.2 User Action

User initiates or selects "Outgoing call" on HF_RD_DT while DUN Data communication is ONGOING under CIRCUIT-SWITCHED DATA MODE.

4.2.6.3 Post Conditions

In the table below the post-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State during call	IDLE	IDLE
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (CIRCUIT-SWITCHED DATA MODE) State	N/A(Terminated)	N/A(Terminated)
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	HF_RD_DT	AG_MP_GW

Table 4.2.6.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE.

4.2.6.4 Recommendation

Under the Circuit-Switched data mode, it is impossible to make a phone call at the same time.

It is recommended to provide a way of terminating an ongoing data connection on HF_RD_DT (by menu, button and so on) in case user wants to make a outgoing voice call.

HF_RD_DT should not initiate outgoing call while DUN data communication is under Circuit-Switched data mode because the application layer of HF_RD_DT knows that DUN is under Circuit-Switched data mode.

4.2.6.5 Message Sequence Charts

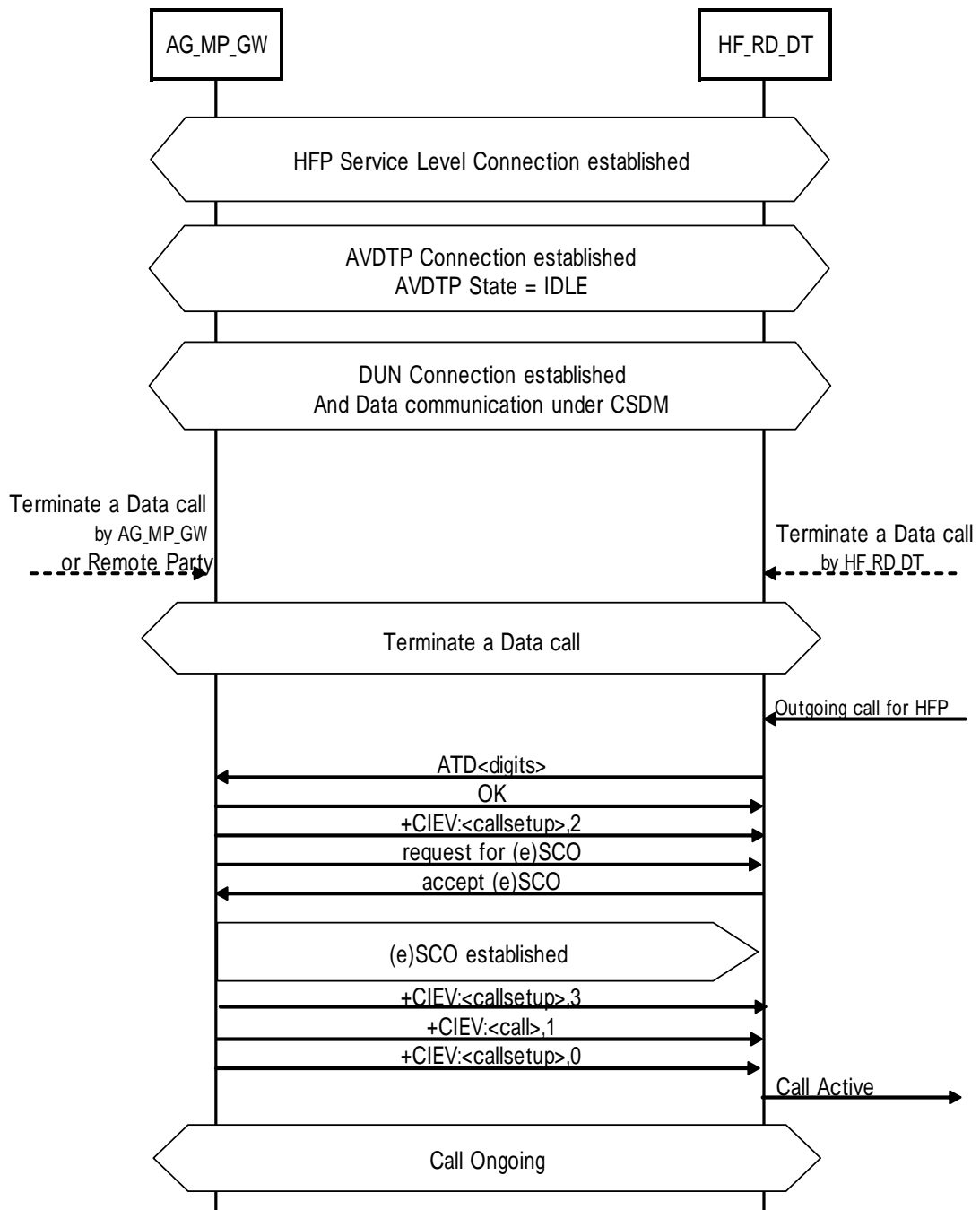


Figure 4.2.6.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE. (HF_RD_DT initiated)

4.2.7 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.2.7.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State during call	Streaming	Streaming
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (CIRCUIT-SWITCHED DATA MODE) State	Data communication	Data communication
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	-	-

Table 4.2.7.1: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

4.2.7.2 User Action

User initiates a voice call or selects "Outgoing call" on HF_RD_DT while DUN Data communication is ongoing under Circuit-Switched data mode.

4.2.7.3 Post Conditions

In the table below the post-conditions for this scenario are listed.

Device	AG_MP_GW	HF_RD_DT
Paired with	HF_RD_DT	AG_MP_GW
AVDTP Signaling channel established with	HF_RD_DT	AG_MP_GW
AVDTP State during call	IDLE	IDLE
DUN connection established with	HF_RD_DT	AG_MP_GW
DUN (CIRCUIT-SWITCHED DATA MODE) State	N/A(Terminated)	N/A(Terminated)
HFP service level connection established with	HF_RD_DT	AG_MP_GW
HFP SCO connection established with	HF_RD_DT	AG_MP_GW

Table 4.2.7.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE.

4.2.7.4 Recommendation

Under the Circuit-Switched data mode, it is impossible to make a phone call at the same time.

It is recommended to provide a way of terminating an ongoing data connection on HF_RD_DT (by menu, button and so on) in case user wants to make a outgoing voice call..

HF_RD_DT should not initiate outgoing call while DUN data communication is under Circuit-Switched data mode because the application layer of HF_RD_DT knows that DUN is under Circuit-Switched data mode.

The procedure of stop streaming at Outgoing call is same as 6.2.8 of SIG WP[9].

4.2.7.5 Message Sequence Charts

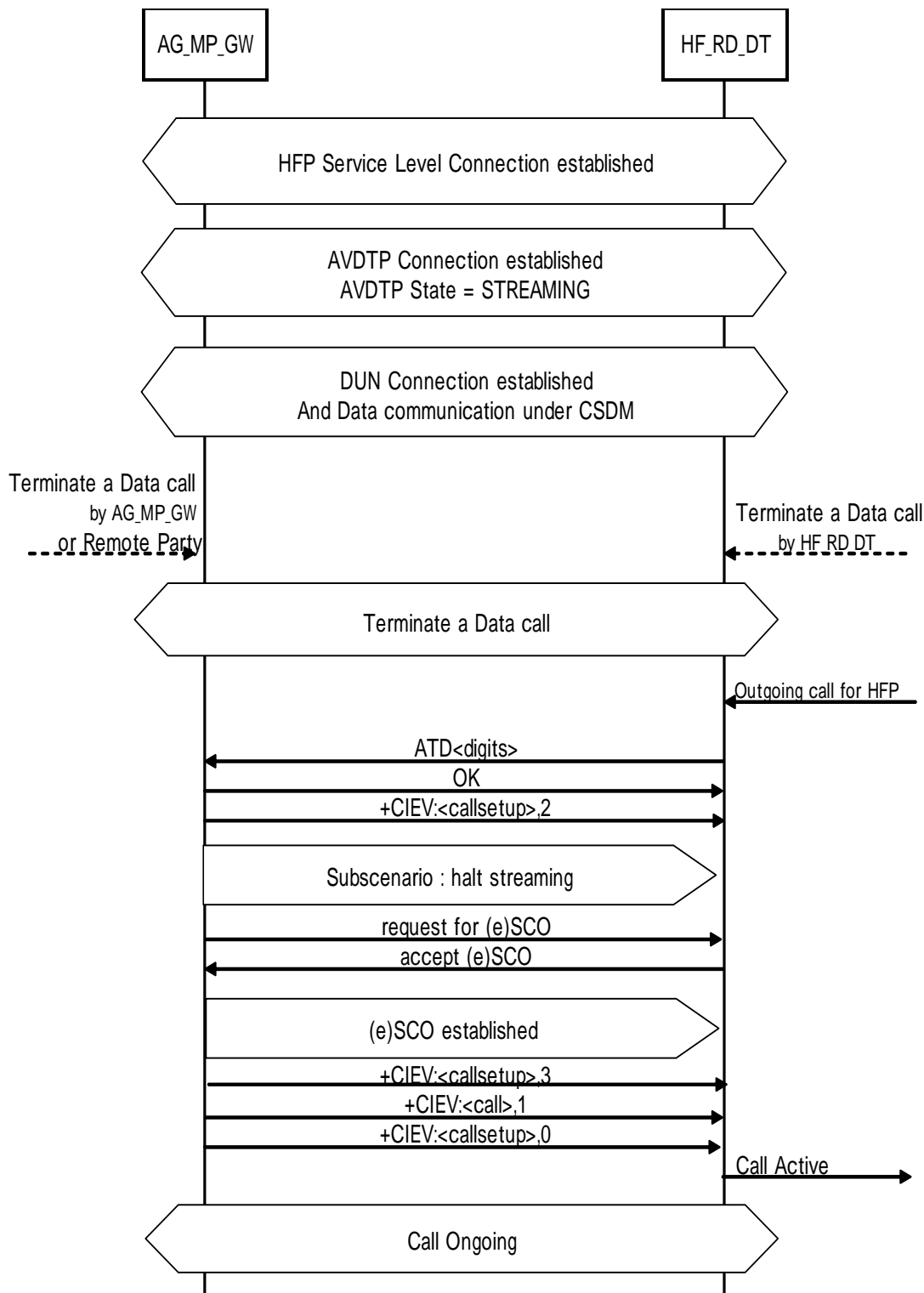


Figure 4.2.7.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE. (HF_RD_DT initiated)

4.3 Use Cases for HFP+A2DP/VDP+AVRCP+DUN WITH THE THIRD DEVICE

4.3.1 HFP+A2DP/VDP+AVRCP+DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC FROM THE THIRD DEVICE.

In case the cellular network does not support concurrent voice and data communication, data communication is suspended when outgoing/incoming voice calls are to be carried out.

Refer to 4.2.1

Note: ストリーミング元がThird DeviceでもSame DeviceでもDUN通信中はストリーミングが継続されるため、DUNで使用するシーケンスは同一になる。

4.3.2 HFP+A2DP/VDP+AVRCP+DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC FROM THE THIRD DEVICE.

Refer to 4.2.2

Note: ストリーミング元がThird DeviceでもSame DeviceでもDUN通信中はストリーミングが継続されるため、DUNで使用するシーケンスは、同一になる。

4.3.3 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE

Refer to 4.13 Answer an Incoming Call of HFP1.5 [1].

Note: DUN Packet-Switched Data 通信中かつThird DeviceとのA2DP Idle状態で着信しても、DUN, A2DPには影響を与えず、DUN/A2DP両ProfileのStateに変化はない。
また通話とデータ通信が同時使用できない網の場合、着信中または通話中はデータ通信はSuspendされるが、DUNのConnectionは維持される。
従って、HFP動作はHFP 1.5 [1] Specの4.13 Answer an Incoming Callが参照される。

4.3.4 HFP+A2DP/VDP+AVRCP+DUN; INCOMING CALL WITHOUT HQ RING TONE UNDER PACKET-SWITCHED DATA MODE AND LISTENING TO MUSIC FROM THE THIRD DEVICE

Refer to “ 6.2.6 HFP+A2DP/VDP+AVRCP INCOMING CALL WHEN LISTENING TO MUSIC FROM A THIRD DEVICE, NO HQ RING SIGNAL[9]” in the document of “SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES” published by Bluetooth SIG

Note: DUN Packet-Switched Data 通信中かつThird DeviceとのA2DP Streaming中に着信しても、DUNには影響を与えず、DUNのStateに変化はなく動作は継続される。
また通話とデータ通信が同時使用できない網の場合、着信中または通話中はデータ通信はSuspendされるが、DUNのConnectionは維持される。従ってHFPの着信により影響を受けるのはA2DPであり、Steamingを中断、再開する手順はWhite Paper[9]が参照される。

4.3.5 HFP-A2DP/VDP-AVRCP+DUN; OUTGOING CALL UNDER PACKET-SWITCHED DATA MODE

Refer to 4.2.5

4.3.6 HFP + A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE(IN CASE OF THE THIRD DEVICE)

Refer to 4.2.6

4.3.7 HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE (IN CASE OF THE THIRD DEVICE)

4.3.7.1 Pre-Conditions

In the table below the pre-conditions for this scenario are listed.

DEVICE	AG_GW	HF_RD_DT	MP
Paired with	HF_RD_DT	AG_GW, MP	HF_RD_DT
AVDTP Signaling channel established with	-	MP	HF_RD_DT
AVDTP State during call	N/A	Streaming	Streaming
AVCTP Signaling channel established with	-	MP	HF_RD_DT
DUN connection established with	HF_RD_DT	AG_GW	-
DUN (CIRCUIT-SWITCHED DATA MODE) State	Data communication	Data communication	N/A
HFP service level connection established with	HF_RD_DT	AG_GW	-
HFP SCO connection established with	-	-	-

Table 4.3.7.1: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE (IN CASE OF THE THIRD DEVICE)

4.3.7.2 User Action

User initiates a voice call or selects “Outgoing call” on HF_RD_DT while DUN Data communication is ongoing under Circuit-Switched data mode.

4.3.7.3 Post Conditions

In the table below the post-conditions for this scenario are listed.

Device	AG_GW	HF_RD_DT	MP
Paired with	HF_RD_DT	AG_GW	HF_RD_DT
AVDTP Signaling channel established with	-	MP	HF_RD_DT
AVDTP State during call	N/A	IDLE	IDLE
AVCTP Signaling channel established with	-	MP	HF_RD_DT
DUN connection established with	HF_RD_DT	AG_GW	-
DUN (CIRCUIT-SWITCHED DATA MODE) State	N/A(Terminated)	N/A(Terminated)	N/A
HFP service level connection established with	HF_RD_DT	AG_GW	-
HFP SCO connection established with	HF_RD_DT	AG_GW	-

Table 4.3.7.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE. (IN CASE OF THE THIRD DEVICE)

4.3.7.4 Recommendation

Under the Circuit-Switched data mode, it is impossible to make a phone call at the same time.

It is recommended to provide a way of terminating an ongoing data connection on HF_RD_DT (by menu, button and so on) in case user wants to make a outgoing voice call..

HF_RD_DT should not initiate outgoing call while DUN data communication is under Circuit-Switched data mode because the application layer of HF_RD_DT knows that DUN is under Circuit-Switched data mode.

The procedure of stop streaming at Outgoing call is same as 6.2.7 of SIG WP[9].

4.3.7.5 Message Sequence Charts

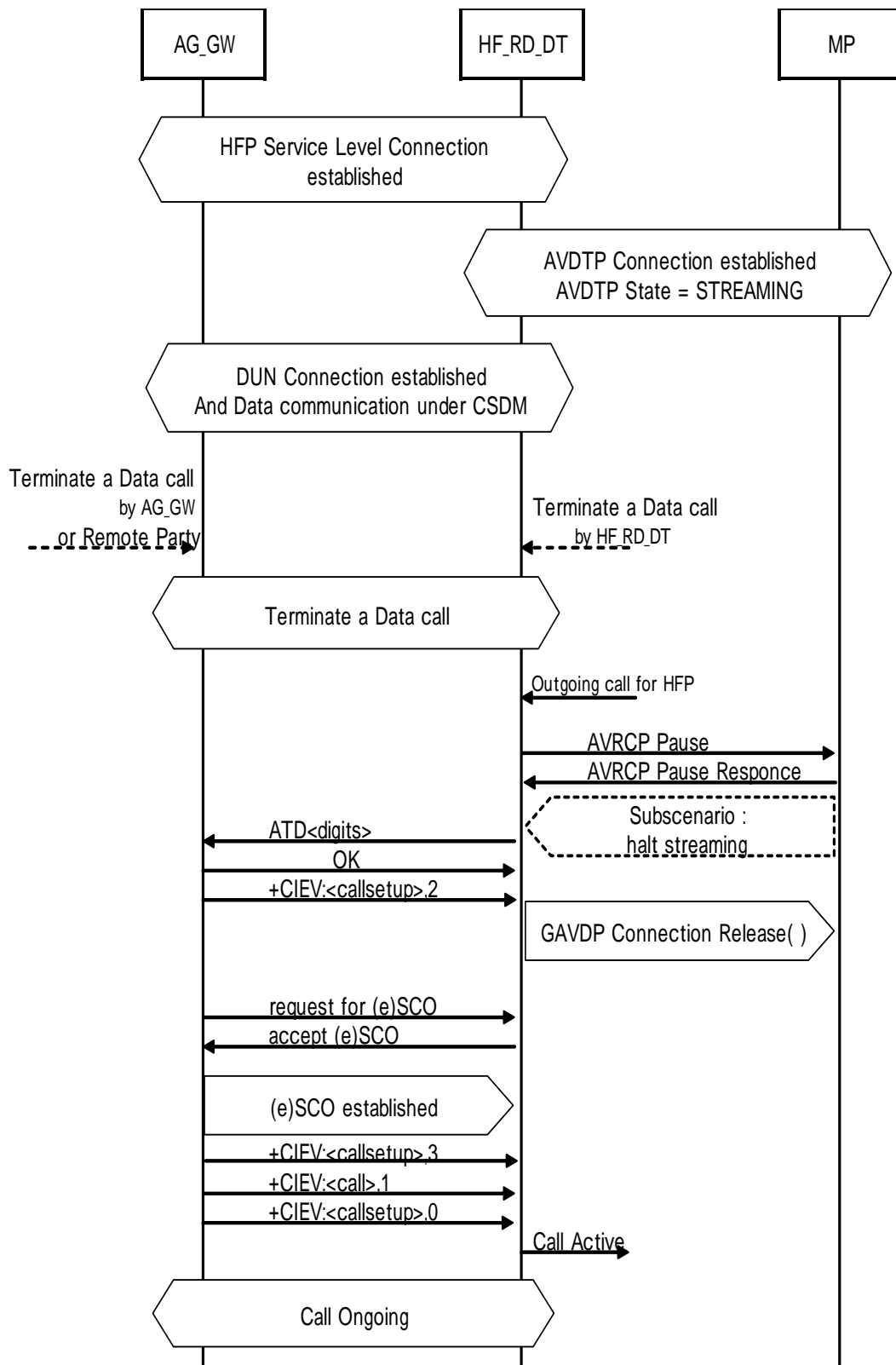


Figure 4.3.7.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE IN CASE OF THE THIRD DEVICE. (HF_RD_DT initiated)

5. Appendix A (Multi Connection use cases)

Multi connection use cases discussed in this document are described in the following tables.

(1) Combination of Two Applications

				Pre-condition							
				HFP		DUN			A2DP		
				SLC	OnGoing	PSDM		CSDM	Streaming	IDLE	
						no DATA	DATA				
Event	Same Device Scenario	HFP	Incoming			*1		*3	*4 (covered by WP)	*1	
			Outgoing					4.1.3			
		DUN	PSDM	*1	4.1.1				Same as 4.2.1		
			CSDM		4.1.2				Same as 4.2.2		
		A2DP	IDLE	*2							
			Streaming								
	Third Device Scenario	HFP	Incoming						*5 (covered by WP)	*1	
			Outgoing								
		DUN	PSDM						Same as 4.3.1		
			CSDM						Same as 4.3.2		
A2DP		IDLE	*1	*2							
		Streaming									

(2) Combination of Three Applications

(2-1) in case DUN event occurred

			Pre-condition			
			HFP=SLC		HFP=Ongoing	
			A2DP= Streaming	A2DP= IDLE	A2DP= Streaming	A2DP= IDLE
DUN Event	Same device Scenario	PSDM	4.2.1	Same as 4.2.1	*2	Same as 4.1.1
		CSDM	4.2.2	Same as 4.2.2		Same as 4.1.2
	Third device Scenario	PSDM	4.3.1	Same as 4.3.1		Same as 4.1.1
		CSDM	4.3.2	Same as 4.3.2		Same as 4.1.2

(2-2) in case A2DP event occurred

			Pre-condition			
			HFP=SLC		HFP=Ongoing	
			DUN= no DATA	DUN= DATA	DUN= no DATA	DUN= DATA
A2DP Event	Same device Scenario	IDLE	*1		*2	
		Streaming				
	Third device Scenario	IDLE				
		Streaming				

(2-3) in case HFP event occurred

			Pre-condition					
			A2DP=IDLE			A2DP=Streaming		
			DUN=PSDM		DUN= CSDM	DUN=PSDM		DUN= CSDM
DUN= no DATA	DUN= DATA	DUN= no DATA	DUN= DATA					
HFP Event	Same device Scenario	Incoming	4.2.3(No HQ Ring)		*3	4.2.4(No HQ Ring)		*3
		Outgoing	4.2.5		4.2.6	*6 (covered by WP)		4.2.7
	Third device Scenario	Incoming	4.3.3(No HQ Ring)		*3	4.3.4(No HQ Ring)		*3
		Outgoing	4.3.5		4.3.6	*7 (covered by WP)		4.3.7

*1 This case should not care because there isn't technical affection. Since the Pre-condition does not affect behavior of event, the message sequence charts when each profile (HFP, DUN, A2DP) is operated independently are applied in this case. Then behavior shall be referred to sequences for each profile.

*2 This case should not be cared because this combination of application is unusual.

*3 This case should not be cared because incoming call isn't available during CSDM data communication.

*4 This case is covered by SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES [9], 6.2.8 HFP+A2DP/VDP+AVRCP INCOMING CALL WHEN LISTENING TO MUSIC TO THE SAME DEVICE, NO HQ RING SIGNAL

*5 This case is covered by SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES [9], 6.2.9 HFP+A2DP/VDP+AVRCP INCOMING CALL WHEN LISTENING TO MUSIC FROM A THIRD DEVICE, NO HQ RING SIGNAL

*6 Even if a call is received or triggered during A2DP streaming with a concurrent DUN session in No Data or PSDM state, the DUN session is not affected. The sequence described in 6.2.8 of the SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES [9] therefore applies.

*7 Even if a call is received or triggered during A2DP streaming with a concurrent DUN session in No Data or PSDM state, the DUN session is not affected. The sequence described in 6.2.7 of the SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES [9] therefore applies.

6. Appendix B (実装上の注意事項)

この章はBluetooth無線通信の相互接続性を確保する上で、実装上注意すべき点をまとめたものである。

B-1 AVRCP パススルーコマンドに関する注意

AVRCPにおいては、ボタンを押した後2秒以内に離されなければ、2秒以内ごとにPASS THROUGHのプレスコマンドを送らなければならない。これはAVRCP Specification[5]が参照するAV/C Panel Subunit Specification[8]に従うものである。

AVRCPにおいては、PASS THROUGHのプレスコマンドが送られた後もボタンが押し続けられているならば、更なるプレスコマンドを前のプレスコマンドの2秒以内に送らなければならない。これはボタンが離されるまで繰り返される必要がある。

7. Appendix C (HALT STREAMING Sub-scenarios)

In the following message sequence chart some procedures of the GAVDP specification are used. For the specific content of the procedures, please see the GAVDP specification.

Note: The INT and ACP roles in MSC of sub-scenarios are not to be confused with the corresponding roles in the underlying L2CAP layer.

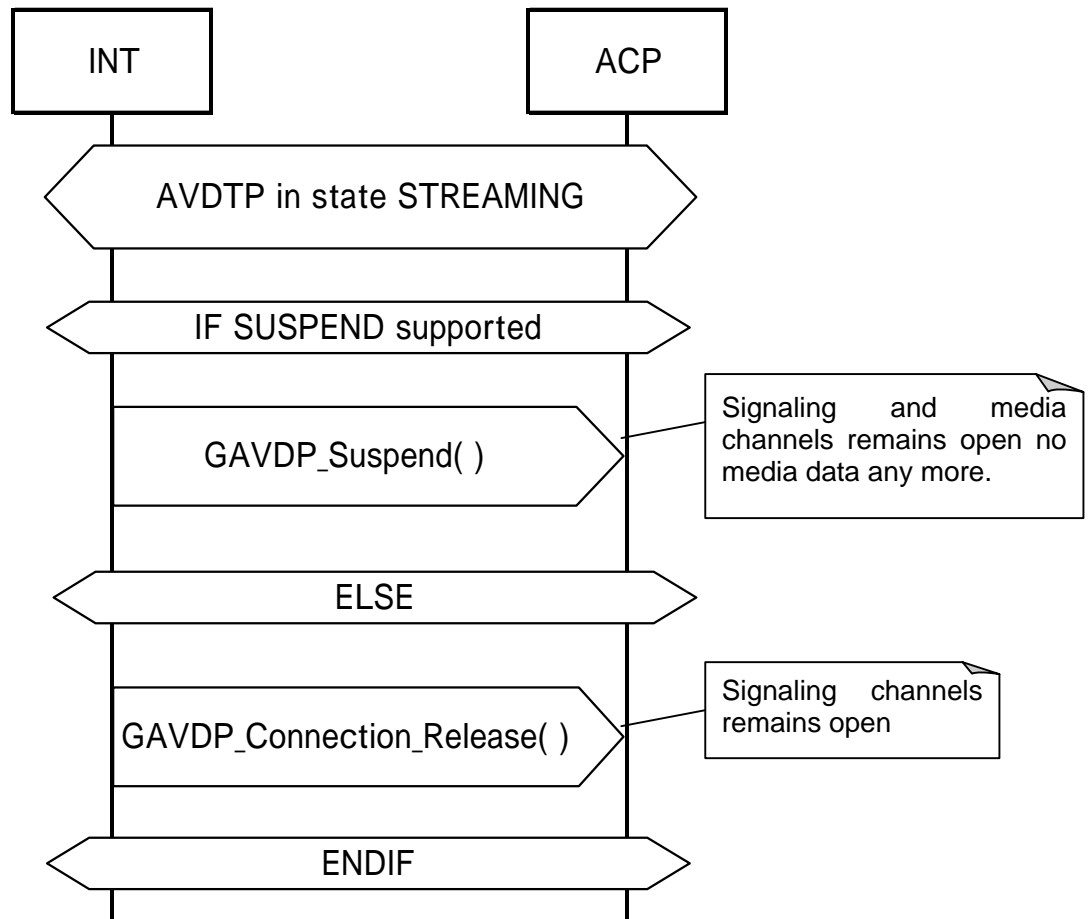


Figure 7.1: Sub-scenario halt streaming

Even if ACP supports SUSPEND, it shall be prepared that GAVDP_Connection_Release is used since AVDTP_SUSPEND is not a mandatory command.

8. LIST OF FIGURES

[Figure 1.2.1 example system configuration Case 1](#)

[Figure 1.2.2. example system configuration Case 2](#)

[Figure 3.2 Example of command procedure](#)

[Figure: 4.1.1.5. HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL](#)

[Figure: 4.1.2.5. HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP](#)

[Figure: 4.1.3.5. HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE](#)

[Figure: 4.2.1.5. HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC](#)

[Figure: 4.2.2.5. HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.](#)

[Figure 4.2.5.5. HFP+A2DP/VDP+AVRCP+DUN ; OUTGOING CALL WITH NO DATA/DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE.](#)

[Figure 4.2.6.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE.](#)

[Figure 4.3.7.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE. \(HF_RD_DT initiated\)](#)

[Figure 4.3.7.5. HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE IN CASE OF THE THIRD DEVICE. \(HF_RD_DT initiated\)](#)

[Figure 7.1: Sub-scenario halt streaming](#)

9. LIST OF TABLES

Table 4.1.1.1: Pre-conditions: HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL.

Table 4.1.1.3: Post-Conditions: HFP+DUN ; STARTING DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE DURING ONGOING CALL.

Table 4.1.2.1: Pre-Conditions: HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP.

Table 4.1.2.3: Post-Conditions: HFP+DUN; STARTING DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE WHILE ONGOING CALL HFP.

Table 4.1.3.1: Pre-Conditions: HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

Table 4.1.3.3: Post-Conditions: HFP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

Table 4.2.1.1: Pre-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

Table 4.2.1.3: Post-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER PACKET-SWITCHED DATA MODE WHILE LISTENING TO MUSIC

Table 4.2.2.1: Pre-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

Table 4.2.2.3: Post-Conditions: HFP + A2DP/VDP + AVRCP + DUN; DATA COMMUNICATION STARTING UNDER CIRCUIT-SWITCHED DATA MODE WHILE LISTENING TO MUSIC.

Table 4.2.5.1: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN ; OUTGOING CALL WITH NO DATA/DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE.

Table 4.2.5.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN ; OUTGOING CALL WITH NO DATA/DATA COMMUNICATION UNDER PACKET-SWITCHED DATA MODE.

Table 4.2.6.1: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

Table 4.2.6.3: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE.

Table 4.3.7.51: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

Table 4.3.7.53: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE

Table 4.3.7.51: Pre-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE (IN CASE OF THE THIRD DEVICE)

Table 4.3.7.53: Post-Conditions: HFP+A2DP/VDP+AVRCP+DUN; OUTGOING CALL WHILE LISTENING TO MUSIC AND DATA COMMUNICATION UNDER CIRCUIT-SWITCHED DATA MODE. (IN CASE OF THE THIRD DEVICE)

References

- [1] HFP specification 1.5 or later from www.bluetooth.org
- [2] AVDTP specification 1.0 or later from www.bluetooth.org
- [3] A2DP specification 1.0 or later from www.bluetooth.org
- [4] AVCTP specification 1.0 or later from www.bluetooth.org
- [5] AVRCP specification 1.0 or later from www.bluetooth.org
- [6] VDP specification 1.0 or later from www.bluetooth.org
- [7] GAVDP specification 1.0 or later from www.bluetooth.org
- [8] DUN specification 1.0 or later from www.bluetooth.org
- [9] SIMULTANEOUS USE OF HFP, A2DP, AND AVRCP PROFILES from www.bluetooth.org

MCPC TR-008 ver.1.1 Japanese
Bluetooth Multi-Connection Technical Reference

平成21年03月25日

発行元: モバイルコンピューティング推進コンソーシアム(MCPC)
〒105-0011 東京都港区芝公園3-5-12 芝公園真田ビル

本書の一部または全部を無断で複写(コピー)することは著作権及び
出版者の権利侵害となります。
本書からの転載は原則禁止です。他の書籍等に転載する場合はモバイル
コンピューティング推進コンソーシアム(MCPC)の許可を必ず得てください。