



**Research & Vehicle Technology**  
**“Infotainment Systems Product Development”**

**Feature – BT Phone**

**HUD Infotainment Subsystem Part Specific  
Specification (SPSS)**

Version 1.2

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**FORD CONFIDENTIAL**



## Revision History

Date	Version	Notes	
July 31, 2014	1.0	Initial Release	
October 30, 2014	1.1	Updated Release	Updates for HUD Use Cases, removal of accept/reject calls
	BTP-CLD-REQ-031350/B-BT Phone Client (TcSE ROIN-149514-3)	rpaquet2 - Added new requirement because of D544 HMI change for SWC Send button.	
	STR-087310/B-Requirements (TcSE ROIN-150502)	rpaquet2 - Added new requirement for SWC Send button for D544 HMI.	
	BTP-SR-REQ-099766/A-SWC Send Button Interaction	rpaquet2 - New requirement for D544 HMI.	
	STR-168031/B-Interface Requirements	rpaquet2 - Removed request interfaces as HUD no longer sends requests to APIM. Also removed response signals as there is no longer requests sent.	
	BTP-IIR-REQ-092533/B-BT Phone Server Status Signals	rpaquet2 - removed signals for Text message.	
	BTP-UC-REQ-092540/B-Accept Incoming Call	rpaquet2 - Updated use case as HUD no longer can accept or reject calls directly.	
	BTP-UC-REQ-092542/B-Reject Incoming Call	rpaquet2 - Reworded use case as HUD can no longer accept or reject calls.	
	BTP-UC-REQ-092544/B-Accept Second Incoming Call	rpaquet2 - Updated use case since HUD can no longer accept or reject incoming calls directly.	
	BTP-UC-REQ-092545/B-Reject Second Incoming Call	rpaquet2 - Updated use case since HUD can no longer accept or reject incoming calls directly.	
	BTP-UC-REQ-092552/B-End Call	rpaquet2 - Updated use case since HUD can no longer end calls. Also changed name of Use case to just End Call.	
July 7, 2015	1.2	Updated Release	
	BTP-HMI-REQ-162466/A-Closing Caller ID Display	rpaquet2 - New requirement for HUD.	



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# 1 General Requirements

## Architectural Design

### 1.1 BTP-SR-REQ-030676/A-Caller Identification data during Call Waiting function (TcSE ROIN-202936-1)

If there is one call active, and the other call on hold, and one of the two calls is ended or dropped, by the BT Phone Server, the BT Phone Server shall re-send BTCallerIdentification\_St to the BT Phone Client to indicate the caller id for the remaining call. The Validity parameter shall be set to CLID Incoming Available (0x0).

### 1.2 BTP-SR-REQ-030677/A-Caller Identification data when one call ends during Conference Call function (TcSE ROIN-202938-1)

When BTPhoneSts.St changes from ConferenceCall (0xD) to Connected (0x3) [one of the two calls in the conference ends or is dropped], the BT Phone Server shall re-send the BTCallerIdentification\_St for remaining call. Validity shall be set to CLID Incoming Available (0x0).

### 1.3 BTP-HMI-REQ-030678/A-BTCallerIdentification.St - CallerID Name or Number is unknown (TcSE ROIN-280513-1)

If the BT Phone Client receives the BTCallerIdentification.St and the CallID Number or CallID Name parameter in this TP method is only populated with an end of string character (0x0) then the respective field shall indicate information is not available. See HMI documentation for exact text to be shown.

### 1.4 BTP-HMI-REQ-162466/A-Closing Caller ID Display

The BT Phone Client shall clear the Caller ID information once the BTPhoneSTs\_St signal transitions from an incoming call state to a connected state or call ended state. See diagrams for Incoming Call Accept/Reject, Call Waiting Call and End Call to see how the signal is used.

#### Incoming Call States:

0x06 Incoming Call  
0x0E Connected, Second Incoming Call

#### Connected States:

0x02 Dialing  
0x03 Connected  
0x09 Phone Busy  
0x0C BT Phone in Private  
0x0D Conference Call  
0x0F Connected, other call on hold  
0x10 Connected, call on hold

#### Call Ended or No Call Active States:

0x01 Idle, Existing Link to BT Phone  
0x0A VR session active in phone



## 2 Architectural Design

### Architectural Design

#### 2.1 BTP-CLD-REQ-031350/B-BT Phone Client (TcSE ROIN-149514-3)

Responsibility: The BT Phone Client is the interface of the BT Phone function. It acts with other system parts that control the BT Phone or need data from it.

##### 2.1.1 Requirements

###### 2.1.1.1 BTP-SR-REQ-031351/A-InitiateBtCall.Rq - Adequate Response (TcSE ROIN-150823-1)

Adequate response to a InitiateBtCall.Rq shall be given by CES (Command Execution Status) as referenced in "MM ISO 15765-2 Message Catalogue" specification.

###### 2.1.1.2 BTP-SR-REQ-031352/A-Caller Identification Information (TcSE ROIN-159119-2)

While two calls are connected during Call waiting or Join Calls functions, the BT Phone Client shall retain the Caller identification information for both calls. ~~It will not be re-sent by the BT Phone Server as operations in these functions are accessed by the user.~~

~~For example, for the use case of switching between connected calls, the BT Phone Client shall update the HMI with the Caller ID information of the active call as it switches from one call to another, without needing the BT Phone Server to provide the Caller ID information again.~~

###### 2.1.1.3 BTP-SR-REQ-031353/A-Incoming text message from Email Address (TcSE ROIN-169279-1)

Upon receiving the BtCallerIdentification.St signal with a Validity parameter encoding of "0x5: CLID Incoming SMS Not available", the BT Phone Client shall not allow an Initiate Call use case to occur.

###### 2.1.1.4 BTP-HMI-REQ-031354/A-Phone Mute Display Priority (TcSE ROIN-202902-1)

If PhMicrophoneMute.St = MicrophoneIsMuted (\$1) and BtPhoneSts.St = Connected (\$3), ConferenceCall (\$D), or ConnectedOtherCallOnHold (\$F), the mute shall take the display priority.

All other encodings for BtPhoneSts.St shall have display priority over the PhoneMicrophoneMute.St.

###### 2.1.1.5 BTP-SR-REQ-099766/A-SWC Send Button Interaction

The BT Phone Client shall display the incoming call menu when the Send button is received and the BT Phone Server is indicating that a phone call is active.

Phone Call is considered active when BtPhoneSts.St equals the following:

- 0x02 Dialing
- 0x03 Connected
- 0x09 Phone Busy
- 0x0C BT Phone in Private
- 0x0D Conference Call
- 0x0F Connected, other call on hold
- 0x10 Connected, call on hold

The BT Phone Client shall display the Recent Calls menu when the Send button is received and the BT Phone Server is indicating that a phone is connected but not in a call.

Phone is connected and not in a call when BtPhoneSts.St equals the following:

- 0x01 Idle, Existing Link to BT Phone
- 0x0A VR session active in phone



The BT Phone Client shall request the Phone Root list once the Send button is received and then request the All Calls list from the root list. The BT Phone Client shall parse the Root list in order to detect which item is the All Calls list. Please see List Browse Protocol feature for definition on how to request the lists.

## 2.2 Interface Requirements

### Interface Requirements

#### 2.2.1 BTP-IIR-REQ-092533/B-BT Phone Server Status Signals

Method	Notes	Parameters
<b>BTCallerIdentification.St()</b>	<p>Message Type: Status</p> <p>The CallerIdentification attribute carries the CLI number and the caller name (stored in the phone book). If no "CallerIdentification" is available, Validity is set to Not Available and the Caller Number and Caller Name string is not sent.</p> <p>The attribute also holds information about the index of the currently used phone.</p> <p>It is sent over the ISO 15765-2 protocol.</p>	<p>int <i>Phone Type</i>:</p> <p>0x0 No category 0x1 Home 0x2 Office 0x3 Mobile 0x4 Other 0x5 Unknown 0x6 Fax</p> <p>int <i>Validity</i> :</p> <p>0x0: CLID Incoming Available 0x1: CLID Second incoming call available 0x2: CLID Outgoing Call 0x3: CLID Incoming SMS available 0x4: CLID Incoming Not available 0x5: CLID Incoming SMS Not available</p> <p>int <i>Index of Phone</i> :</p> <p>3 bits, index 1-6 (1 = Cradle Phone if fitted); 0x0 = Reserved</p> <p>int <i>Caller number</i> :</p> <p>25 bytes chars</p> <p>int <i>Caller name</i> :</p> <p>18 bytes chars</p>

**BTPhoneSts.St()**

Message Type: Status

The Attribute BTPhoneSts shall reflect the current state of the Phone.

int *Status* :

0x00: Invalid

0x01: Idle, Existing link to BT Phone

0x02: Dialing

0x03: Connected

0x04: Cradle Phone not ready

0x05: Number Unobtainable

0x06: Incoming Call

0x07: No link to Phone

0x08: Initialising BT connection

0x09: Phone busy

0x0A: VR Session active in phone

0x0B: Device Not supported (only Cradle phone)

0x0C: BT phone in Private

0x0D: Conference Call

0x0E: Connected, Second Incoming Call

0x0F: Connected, other call on hold

0x10: Connected, Call on hold



### 3 Functional Definition

Architectural Design

#### 3.1 BTP-FUN-REQ-092534/A-Incoming Call

##### 3.1.1 Use Cases

Use Cases

##### 3.1.1.1 BTP-UC-REQ-092539/A-Incoming Call

<b>Actors</b>	User
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Not in call No Incoming Text
<b>Scenario Description</b>	Incoming call
<b>Post-conditions</b>	HUD HMI displays incoming call information
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

##### 3.1.1.2 BTP-UC-REQ-092540/B-Accept Incoming Call

<b>Actors</b>	System
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Not in call No Incoming Text Incoming Call Notification active
<b>Scenario Description</b>	System indicates phone call accepted.
<b>Post-conditions</b>	Call Active HMI clears incoming call display
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

##### 3.1.1.3 BTP-UC-REQ-092541/A-Ignore Incoming Call

<b>Actors</b>	Driver
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Not in call





	No Incoming Text Incoming Call Notification active
<b>Scenario Description</b>	User ignores incoming call and phone call indication ends.
<b>Post-conditions</b>	HMI clears incoming call display.
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

#### 3.1.1.4 BTP-UC-REQ-092542/B-Reject Incoming Call

<b>Actors</b>	System
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Not in call No Incoming Text Incoming Call Notification active
<b>Scenario Description</b>	System indicates phone call rejected.
<b>Post-conditions</b>	HMI clears incoming call display
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

#### 3.1.1.5 BTP-UC-REQ-092547/A-Incoming Call with Warning in HUD

<b>Actors</b>	Driver
<b>Pre-conditions</b>	HUD image selected "on" Ongoing FCW
<b>Scenario Description</b>	Incoming phone call indication.
<b>Post-conditions</b>	No phone call indication during FCW. Display phone call information if FCW ends while incoming call indication still active.
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, Phone interface

### 3.1.2 Sequence Diagrams

#### 3.1.2.1 BTP-SD-REQ-030699/A-Incoming Call - Accept Call (TcSE ROIN-118785-3)

##### Scenarios

###### Normal Usage

The user receives an incoming call, and chooses to accept it. HMI displays {Caller ID, Name, Call duration}

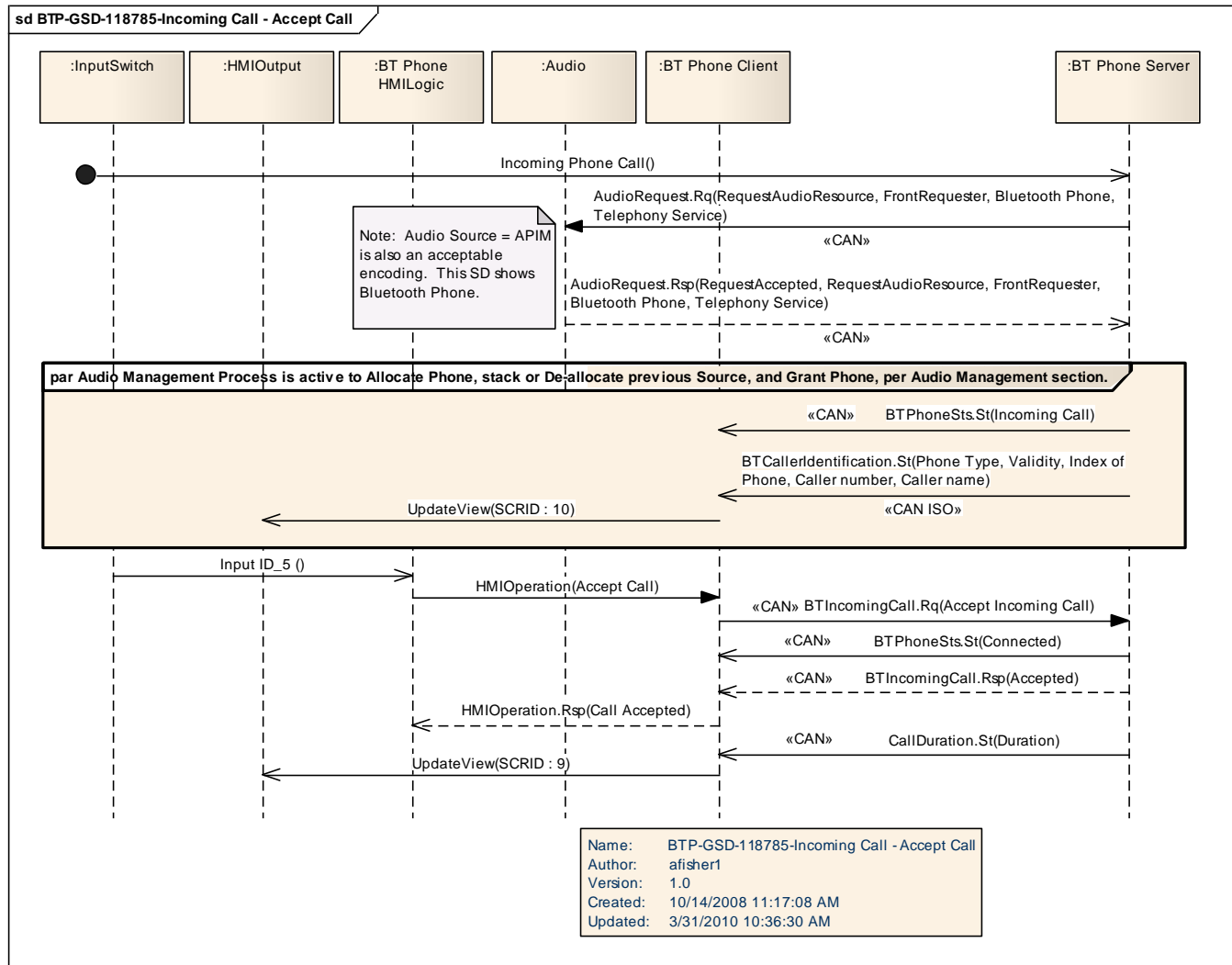
##### Constraints

###### Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

**Post-condition**

The user <accepts the incoming call> from the HMI interface.

**Sequence Diagram****3.1.1.2.2 BTP-SD-REQ-030700/A-Incoming Call - Reject Call (TcSE ROIN-149690-3)****Scenarios****Normal Usage**

The user receives an incoming call, and chooses to reject it. HMI returns to previous screen.

**Constraints****Pre-condition**

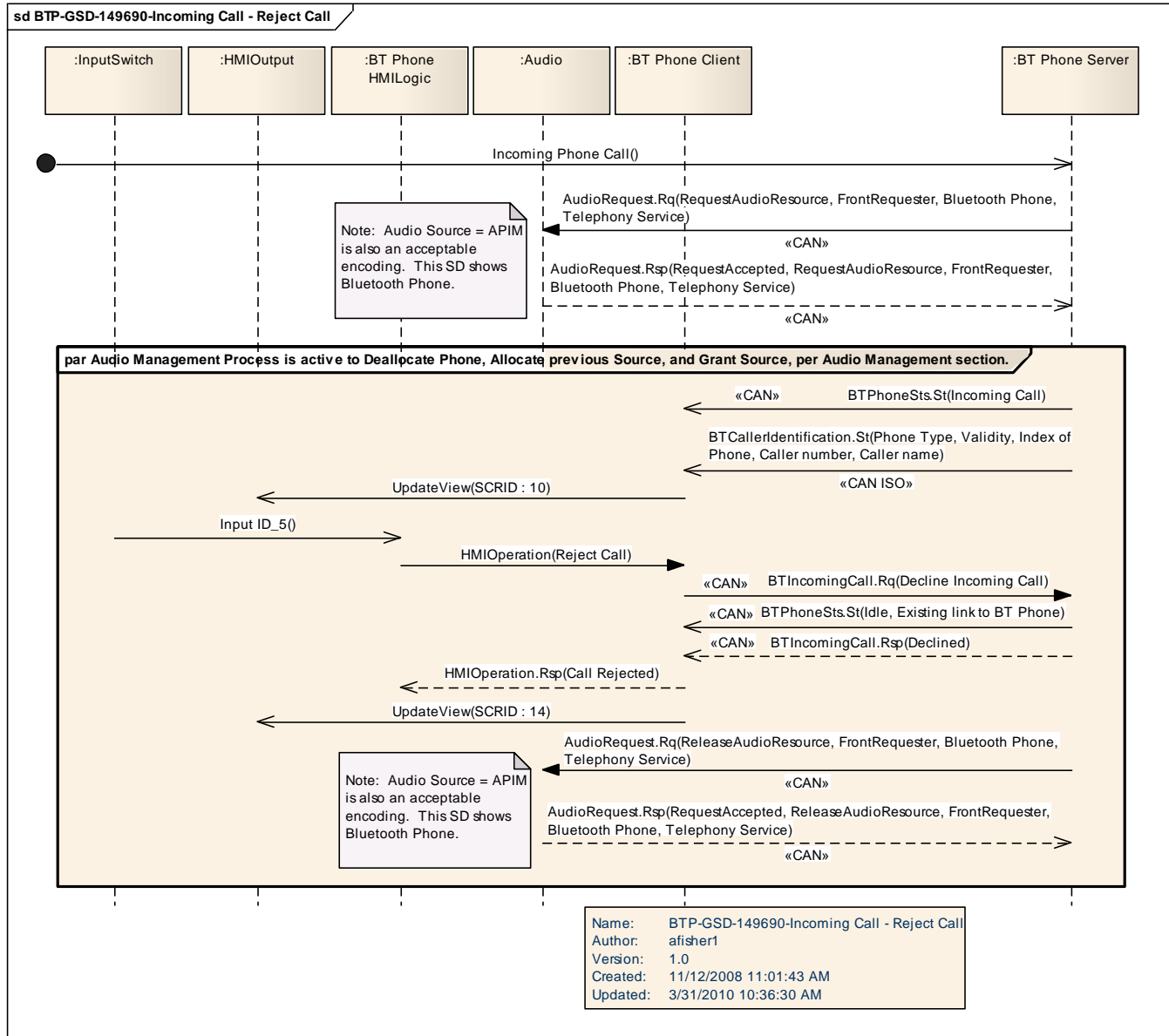
A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

**Post-condition**

HMI indicates {previous screen prior to incoming call}



## Sequence Diagram



## 3.2 BTP-FUN-REQ-092536/A-Call Waiting Call

## 3.2.1 Use Cases

## Use Cases

## 3.2.1.1 BTP-UC-REQ-092543/A-Second Incoming Call

Actors	Driver
Pre-conditions	HUD image selected "on" No warning messages in HUD – including FCW Call active
Scenario Description	User already in a call and receives incoming phone call.



<b>Post-conditions</b>	HUD displays incoming call information
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

### 3.2.1.2 BTP-UC-REQ-092544/B-Accept Second Incoming Call

<b>Actors</b>	System
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Phone call active
<b>Scenario Description</b>	System indicates second incoming phone call is accepted.
<b>Post-conditions</b>	HMI clears incoming call display
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

### 3.2.1.3 BTP-UC-REQ-092545/B-Reject Second Incoming Call

<b>Actors</b>	System
<b>Pre-conditions</b>	HUD image selected "on" No warning messages in HUD – including FCW Phone call active
<b>Scenario Description</b>	System indicates second incoming call is rejected.
<b>Post-conditions</b>	HMI clears incoming call display
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, SWC, Phone interface

## 3.2.2 Sequence Diagrams

### 3.2.2.1 BTP-SD-REQ-030715/A-Call Waiting Call (TcSE ROIN-149471-2)

#### Scenarios

##### Normal Usage

The user is currently in an active call. HMI indicates {Calling waiting call, caller id, and accept/reject}. User selects <Accept / Reject> via HMI.

#### Constraints

##### Pre-condition

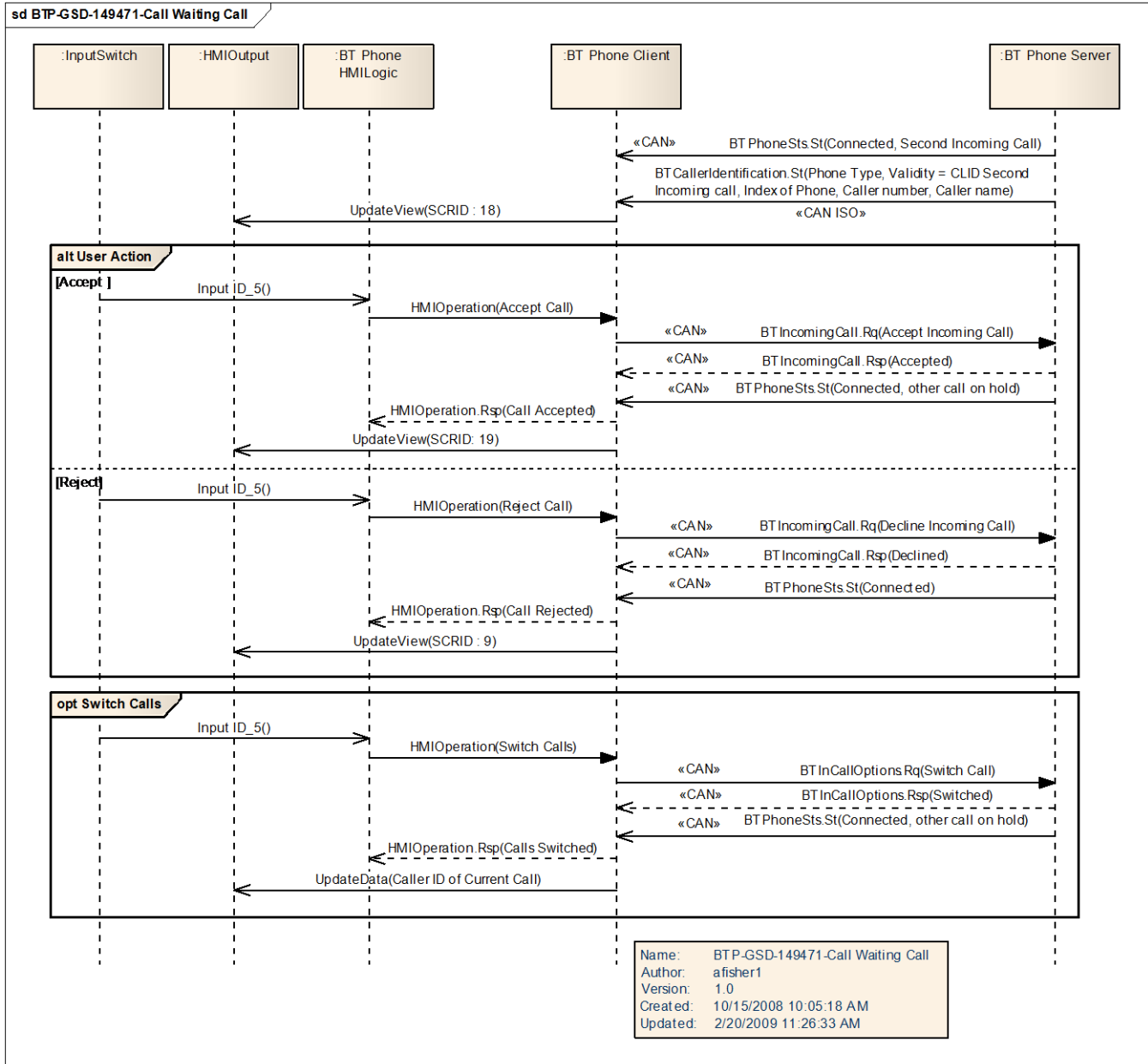
A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call. Another incoming call is received.

##### Post-condition

The user accepts or rejects second call, and continues in phone call. If second call is accepted, the first call is placed on hold.



## Sequence Diagram



## 3.3 BTP-FUN-REQ-092537/A-End Call

## 3.3.1 Use Cases

## Use Cases

## 3.3.1.1 BTP-UC-REQ-092552/B-End Call

Actors	System
Pre-conditions	HUD image selected "on" No warning messages in HUD – including FCW Call Active
Scenario	System indicates call ended.



<b>Description</b>	
<b>Post-conditions</b>	HMI clears call display
<b>List of Exception Use Cases</b>	
<b>Interfaces</b>	G-HMI, Phone interface

### 3.3.2 Sequence Diagrams

#### 3.3.2.1 BTP-SD-REQ-030705/A-End Call (TcSE ROIN-149457-3)

##### Scenarios

###### Normal Usage

The user selects <End Call> via the HMI.

##### Constraints

###### Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call.

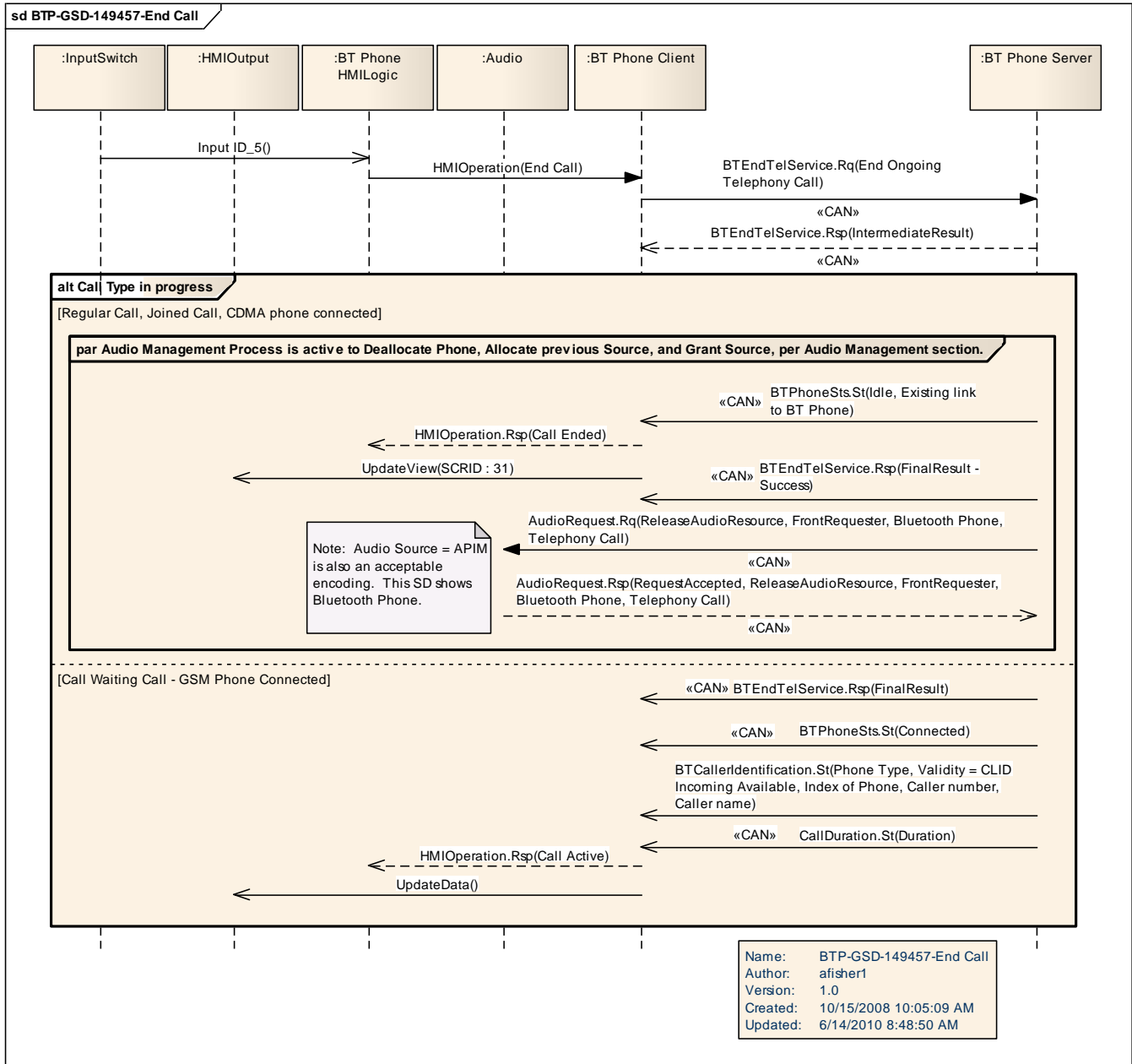
###### Post-condition

If active call is a regular one party call, a joined call, or a CDMA call waiting call, the active call is ended.

If active call is a call waiting call with a GSM phone connected, the current active call is ended, and the second call currently on hold is made the active call.



## Sequence Diagram





## 4 Appendix: Reference Documents

Reference #	Document Title