



Wireless Telephony Application Interface

IS95-specific Addendum

Version 08-Sep-2001

Wireless Application Protocol
WAP-228-WTAIIS95-20010908-a

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1. Scope

Wireless Application Protocol (WAP) is a result of continuous work to define an industry wide specification for developing applications that operate over wireless communication networks. The scope for the WAP Forum is to define a set of specifications to be used by service applications. The wireless market is growing very quickly, and reaching new customers and services. To enable operators and manufacturers to meet the challenges in advanced services, differentiation and fast/flexible service creation WAP defines a set of protocols in transport, session and application layers. For additional information on the WAP architecture, refer to "*Wireless Application Protocol Architecture Specification*" [WAPARCH].

This document is an addendum to the *Wireless Telephony Application Interface* (WTAI). While WTAI defines an API that is valid for all supported types of mobile networks, this document outlines functions that are specific to IS-95 networks.

2. References

2.1. Normative References

- [CREQ] WAP-221, "Specification of WAP Conformance Requirements". WAP Forum™, 25-Apr-2001 URL: <http://www.wapforum.org/>
- [FORMAT] WAP-188, "WAP General Formats Document", WAP Forum™, 10-Jul-2001 URL: <http://www.wapforum.org/>
- [IS95A] "Mobile Station - Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System", TIA/EIA-IS-95-A, May 1995.
- [IS637A] "Short Message Service for Spread Spectrum Systems", TIA/EIA Standards, TIA/EIA-637-A, September 1999.
- [RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997. URL: <http://www.ietf.org/rfc/rfc2119.txt>
- [WMLScript] WAP-193 "WMLScript Language Specification", WAP Forum™, 25-Oct-2000 URL: <http://www.wapforum.org/>
- [WTA] WAP-266, "Wireless Telephony Application Specification", WAP Forum™, 08-Sep-2001 URL: <http://www.wapforum.org/>
- [WTAI] WAP-268, "Wireless Telephony Application Interface Specification", WAP Forum™, 08-Sep-2001 URL: <http://www.wapforum.org/>

2.2. Informative References

- [WAPARCH] WAP-210, "WAP Architecture", WAP Forum™, 12-Jul-2001 URL: <http://www.wapforum.org/>

3. Terminology and Conventions

3.1. Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2. Definitions

WMLScript - a scripting language used to program the mobile device. WMLScript is an extended subset of the JavaScript™ scripting language.

3.3. Abbreviations

API	Application Programming Interface
IS-95	CDMA Mobile Station – Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System.
IS-637	Short Message Services for Wideband Spread Spectrum Cellular Systems.
RFC	Request For Comments
WAP	Wireless Application Protocol
WTA	Wireless Telephony Applications
WTAI	Wireless Telephony Applications Interface
WAP	Wireless Application Protocol

4. Introduction

The WAP WTAI features provide the means to create Telephony Applications, using a WTA user-agent with the appropriate WTAI function libraries. A typical example is to set-up a mobile originated call using the WTAI functions accessible from either a WML deck/card or WMLScript. The application model for WTA is described in [WTA].

The IS95 addendum extends the support of [WTAI] to IS95 technology devices by extending the network common Network Message models.

5. IS95

5.1. Network Message Model

5.1.1. Network Message State

IS-95 network text messages are called Short Message Service (SMS) messages. The WTA network message model in IS-95 for incoming messages is identical to Network Common WTAI Message model for incoming messages (See [WTAI]). For outgoing messages, the message model is illustrated in Figure 1 below. IS95 WTA implementations MUST support the Network Common WTAI - Network Message Model for incoming messages and the model illustrated in Figure 1 for outgoing messages.

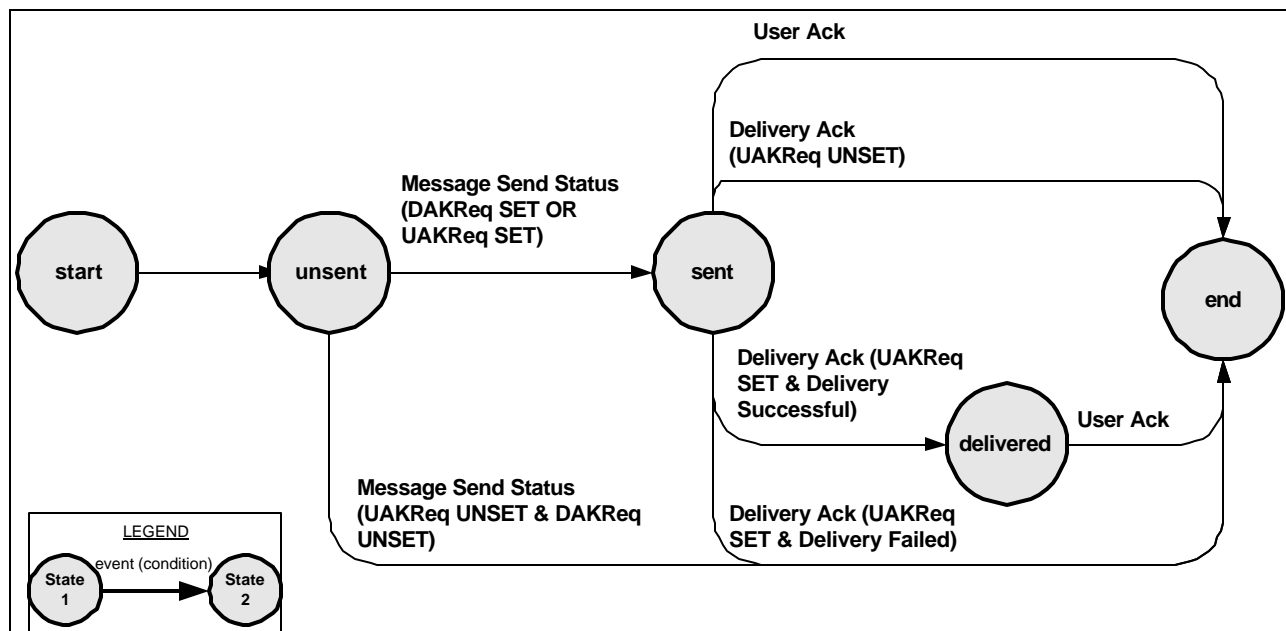


Figure 1. IS -95 Outgoing Message Model

5.1.2. SMS Acknowledgements

In addition to the 'normal' SMS messages defined in [WTAI], [IS637A] defines two special messages:

- the SMS Delivery Acknowledgement and
- the SMS User Acknowledgement

The SMS Delivery Acknowledgement message is originated by the Message Center (MC) in two circumstances:

- When the final destination of a submitted SMS message confirms receipt of the message.
- As a response to a cancellation request of an SMS message.

The SMS User Acknowledgement message is sent from the mobile station because of the end user responding to a previously received SMS message. If the "user_ack" field (see section 5.1.5.1) received in the incoming SMS message indicates that the user acknowledgement is requested, the service should indicate the request to the user. When the user acknowledges the message, the WMLScript function `WTAIS95.sendAck` should be invoked to send an SMS

User Acknowledgement message to the sender of the message. (See section 6.2.3 for details of `WTAIS95.sendAck` function)

Note: The SMS Delivery Acknowledgment and the SMS User Acknowledgment are generated only if requested by the sender of the original SMS message. If the original message is sent using the `WTAIS95.sendText` function (see section for more details), reply options **MUST** be set as defined in [IS637A] based on user input or service defaults. If the SMS message was sent using `WTANetText.send` function (see [WTAI]), reply options **MUST** be set based on pre-defined user settings. User settings/preferences are set in an implementation specific manner.

5.1.3. Network Message Type

A “Message Identifier” sub-parameter is included in the IS95 bearer data of every outgoing or incoming IS95 SMS message. The “Message Identifier” sub-parameter provides the type of the message via the `MESSAGE_TYPE` field and the message identification via the `MESSAGE_ID` field. WTA includes a “`msg_type`” field in every incoming or outgoing WTA network message to indicate to WTA network text services the type of the message (see section 5.1.5). WTA-IS95 **MUST** associate the value of the “`msg_type`” field with the value of the `MESSAGE_TYPE` field in the IS95 SMS message (see [IS637A]). The “`msg_type`” field value **MUST** be one of the following values (all numbers are shown in decimal):

01	Incoming SMS message
02	Outgoing SMS Message
03	<i>Reserved</i> ¹
04	SMS Delivery Acknowledgement message
05	SMS User Acknowledgement message

5.1.4. Network Message Identifier

A `MESSAGE_ID` field is included in every outgoing or incoming IS95 SMS message (see section 5.1.3 above). The value of the `MESSAGE_ID` field is generated by the end point issuing the SMS message as defined in [IS637A] and is used in the end to end acknowledgements generated by the MC or the recipient of the message. WTA-IS95 implementations **MUST** use the `MESSAGE_ID` field value to associate SMS Delivery Acknowledgments or SMS User Acknowledgments with the acknowledged SMS messages. The `MESSAGE_ID` **MUST** be used as described below

- If an SMS Delivery Acknowledgment or an SMS User Acknowledgment is requested in an outgoing message, WTA-IS95 implementations **MUST** associate the value of the “`msgHandle`” assigned to the outgoing WTA network message (see [WTAI]) with the value of the `MESSAGE_ID` field in the sent IS95 SMS message. When the SMS Delivery Acknowledgment or the SMS User Acknowledgment message is received (see section 5.1.2), WTA-IS95 implementations **MUST** associate the `MESSAGE_ID` field that is included in the Acknowledgment message with the “`origMsgHandle`” field (See sections 5.1.5.2 and 5.1.5.3). A WTA service uses the value of the “`origMsgHandle`” field in the received acknowledgement to determine and retrieve information about the acknowledged SMS message.
- If an SMS User Acknowledgment is requested in an incoming message, WTA-IS95 implementations **MUST** associate the value of the `MESSAGE_ID` field (together with other SMS Teleservice parameters such as the Originating Address, Originating Sub-address and the MC Time Stamp in order to ensure a unique message identification) with the “`msgHandle`” of the incoming WTA network message (see [WTAI]). When the `WMLScript`

¹ Message type value “03” is assigned in [IS637A] to a “Cancellation” message. In the current WTAIS95 model, the Cancellation request is not treated as a message (there is no `MessageSendStatus` event associated with a cancellation request sent to the MC and no information on cancellation requests is returned when `WTANetText.list` function is invoked). For this reason, a `msg_type` of value “03” is not used.

function `WTAIS95.sendAck` is invoked to send a User Acknowledgment message, the `msgHandle` parameter value MUST be used to retrieve the `MESSAGE_ID` of the SMS message to be acknowledged.

The way the `MESSAGE_ID` (and possibly other SMS Teleservice parameters) is associated with the `msgHandle` or `origMsgHandle` is implementation specific.

5.1.5. Network Message Information

The WTA user agent provides access to specific information about each network message. Each information field has name and a value. A field value may be retrieved using its name. All the information fields defined in [WTAI] for network messages are available in IS-95 network messages. However, depending on the type of the network message, extra information may be available to the service as described below.

5.1.5.1. SMS Message

The SMS message MUST contain all the fields defined in [WTAI] for network messages. In addition, the following fields MUST be available for each incoming and outgoing SMS message:

`msg_type` integer indicating whether this message is an incoming SMS message or an outgoing SMS message. See section 5.1.3 above for the values of this field.

The SMS message MAY include the following fields as well:

`priority` integer indicating the priority level of this message. The following values apply (All values are shown in decimal):

0	Normal
1	Interactive
2	Urgent
3	Emergency

`delivery_ack` boolean indicating whether the SMS Delivery Acknowledgement is requested or not requested for this message. This field is set to `true` if the SMS User Acknowledgment is requested. Otherwise, it is set to `false`.

`user_ack` boolean indicating whether the SMS User Acknowledgement is requested or not requested for this message. This field is set to `true` if the SMS User Acknowledgment is requested. Otherwise, it is to `false`.

`callback_num` string containing the phone number to be dialed in a reply to this SMS message. An empty string indicates that the callback number is not set

5.1.5.2. SMS Delivery Acknowledgement

All the fields defined in [WTAI] for network messages MUST be included in the SMS Delivery Acknowledgmentmessage.

In addition to the fields defined in [WTAI], The SMS Delivery acknowledgement MUST include the following fields:

`msg_type` integer value indicating that this message is an SMS Delivery Acknowledgement message (see section 5.1.3 above).

`origMsgHandle` handle identifying the message that has been acknowledged. The value of this field is the same as the value of the `msgHandle` of the SMS message being acknowledged.

The `text` field in the SMS acknowledgement contains text added by the MC as described below:

`text` string containing the body of the SMS Delivery acknowledgement message. The body of the message will be one of the following:

- An empty string indicating that the recipients of the SMS message has confirmed the reception of the message.

- An error message, in case the delivery is unsuccessful or an error is reported.
- Text indicating that the SMS message has been cancelled successfully or it has already been delivered in the case where this SMS Delivery Acknowledgement is a response to a cancellation request.

5.1.5.3. SMS User Acknowledgement

In addition to the fields defined in [WTAI] for network messages, The SMS User Acknowledgement MUST include the following fields:

“msg_type” integer indicating that this message is an SMS User Acknowledgement Message. (See section 5.1.3 above).

“origMsgHandle” handle identifying the SMS message the end recipient acknowledged. The value of this field is the same as the value of the *“msgHandle”* of the SMS message being acknowledged.

6. Network Specific WTAI – IS95

In addition to the WTA functionality defined in [WTAI], IS-95 networks also supports the functions & events specified in this chapter. An IS95 WTA implementation MUST support the Network Common WTAI – Network Message model specified in [WTAI].

6.1. Events

WTAI specifies the names of the WTA events that map to the IS-95 mobile network, native events. These mobile network events convey the state of services in the mobile network. They may be handled by the active context or can be used to start the WTA User-agent with a new context. An IS95 WTA implementation MUST support the Network Specific WTAI – IS95 events specified in this chapter.

6.1.1. wtaev-Is95/da

Event Name: DeliveryAck
Event ID: wtaev-is95/da
Parameters: *msgHandle*
Description: Indicates the client has received a SMS Delivery Acknowledgement message.
 The *msgHandle* parameter contains the message handle for the received SMS Delivery Acknowledgement message as defined in [WTAI].

6.1.2. wtaev-Is95/ua

Event Name: UserAck
Event ID: wtaev-is95/ua
Parameters: *msgHandle*
Description: Indicates the client has received a SMS User Acknowledgement message.
 The *msgHandle* parameter contains the message handle for the received SMS User Acknowledgement message as defined in [WTAI].

6.2. WMLScript Functions

The functions defined in this chapter follows the same function definition format as the one used in [WTAI]. Technical terms used in this chapter, e.g. events and error codes, are also explained in [WTAI]. An IS95 WTA implementation MUST support the Network Specific WTAI – IS95 WTAIS95.sendText and WTAIS95.sendAck. An IS95 WTA implementation MAY support the Network Specific WTAI – IS95 WTAIS95.cancelText function.

Name: WTAIS95
Library ID: 521
Description: This library contains functions that are unique to IS-95 implementations of WTA.

6.2.1. WTAIS95.sendText

Function: *sendText(address, text, priority, delivery_ack, user_ack, callback_num)*
Function ID: 0
Description: Sends an SMS message. This function is non-blocking. Subsequent WTA events signal the message transmission progress.

The *address* parameter specifies the destination of the message and must be a phone-number as defined in [FORMAT]. It becomes the "address" field of the network message.

The *text* parameter specifies the text to send. It becomes the "text" field of the network message.

The *priority* parameter indicates the priority level of the message. One of the following values must be used (All numbers are shown in decimal):

0	Normal
1	Interactive
2	Urgent
3	Emergency

The *delivery_ack* parameter indicates if Delivery Acknowledgement message is requested for this message (if value is true) or not (if value is false). It becomes the "delivery_ack" field of the network message.

The *user_ack* parameter indicates if the User Acknowledgement message is requested for this message (if value is true) or not (if value is false). It becomes the "user_ack" field of the network message.

The *callback_num* parameter indicates the number to be dialed in reply to this SMS message. It must be either a phone-number, as defined in [FORMAT], or an empty string. It becomes the "callback_num" field of the network message.

This function returns the message handle if successful, returns an *error-code* under certain conditions, or returns *invalid* if the function fails. (See [WTAI] for a description of the message handle.)

Permission Types: BLANKET, CONTEXT, SINGLE (see [WTA]).

Parameters:

address = string (phone-number)

text = string (message body)

priority = integer (priority level from 0 to 3)

delivery_ack = boolean (true = Delivery Ack requested, false = Delivery Ack not requested)

user_ack = boolean (true = User Ack requested, false = User Ack not requested)

callback_num = string

Return value: handle or *invalid* (failure indication) or *error-code* (must be one of the following decimal values:

- 100 = *text* parameter is too long
- 1 = unspecified error)

Associated Events: A *MessageSendStatus* event occurs when the message enters the "sent" state (if *delivery_ack* or the *user_ack* flag is set to true) or when the message enters the "end" state (if the "delivery_ack" and the "user_ack" are both set to false). See section 5.1.1 for information on message states.

A *DeliveryAck* event or a *UserAck* event occurs when the mobile station receives a User Ack or Delivery Ack message as a response to this message

Exceptions: If the *address* parameter does not contain a phone-number as defined in [FORMAT], this function returns *invalid*.

If the *text* parameter contains an unacceptable character, this function returns *invalid*.

If the *priority* parameter does not reference a supported value, this function returns *invalid*.

If the *user_ack* or the *delivery_ack* parameters contain an invalid value, this function returns *invalid*.

If the *callback_num* parameter does not contain either a phone-number, as defined in [FORMAT], or an empty string this function returns *invalid*.

Example:

```
var handle = WTAIS95.sendText ("4164975540", "Hello!", 0,true,
false,"4162180140");
```

6.2.2. WTAIS95.cancelText

Function: `cancelText (msgHandle)`

Function ID: 1

Description: Cancels the delivery of a pending SMS message in the MC.

The *msgHandle* parameter identifies the SMS message to be cancelled.

This function returns an empty string if successful or *invalid* if it fails.

Permission Types: BLANKET, CONTEXT, SINGLE (see [WTAI]).

Parameters: *msgHandle* = handle

Return value: empty string (successful) or *invalid* (failure indication) or error-code (-1 = unspecified error).

Associated Events: A DeliveryAck (wtaev-is95/da) occurs when the mobile station receives a Delivery Acknowledgement message that was sent by the MC in response to the cancellation request.

Exceptions: If the *msgHandle* parameter does not refer to a network message for which information is available, this function returns *invalid*.

Example:

```
var result = WTAIS95.cancelText(msgHandle);
```

6.2.3. WTAIS95.sendAck

Function: `sendAck (msgHandle)`

Function ID: 2

Description: Sends an SMS User Acknowledgement message in response to an incoming SMS message. See section 5.1.2 for description of the SMS User Acknowledgement message.

The *msgHandle* parameter identifies the SMS message to be acknowledged.

This function returns an empty string if successful or *invalid* if it fails.

Permission Types: BLANKET, CONTEXT, SINGLE (see [WTA]).

Parameters: *msgHandle* = handle

Return value: empty string (successful), *invalid* (failure indication) or error-code (-1 = unspecified error)

Associated Events: A MessageSendStatus event occurs when the acknowledgement message enters the "sent" state.

Exception: If the *msgHandle* parameter does not refer to a network message for which information is available or, for which a User Acknowledgement was required, this function returns *invalid*.

If the Acknowledgement can not be sent e.g. because the outgoing message buffer is full, this function returns `invalid`.

Example: `var result = WTAIS95.sendAck (msgHandle);`

Appendix A. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [CREQ].

A 1 Client features

A 1.1 IS95 Network Message Model

Item	Function	Reference	Status	Requirement
WTAIIS95-NMM-C-001	IS95 Network Message Model	5.1	M	WTAI-NMM-C-001

A 1.2 WTA Events

Item	Function	Reference	Status	Requirement
WTAIIS95-E-C-001	SMS Delivery Acknowledgement (wtaev-is95/da)	6.1.1	M	
WTAIIS95-E-C-002	SMS User Acknowledgement (wtaev-is95/ua)	6.1.2	M	

A 1.3 WMLScript Functions

Item	Function	Reference	Status	Requirement
WTAIIS95-S-C-001	WTAIS95.sendText	6.2.1	M	WTAI-CTE-C-001
WTAIIS95-S-C-002	WTAIS95.cancelText	6.2.2	O	
WTAIIS95-S-C-003	WTAIS95.sendAck	6.2.3	M	WTAI-CTE-C-001

A 1.4 WMLScript Bytecode Interpreter Capabilities

Item	Function	Reference	Status	Requirement
WTAIIS95-INT-C-001	Supports IS-95 Network WTA library identifier	6.2	M	WMLS:MCF
WTAIIS95-INT-C-002	Supports IS-95 Network WTAI function identifiers	6.2	M	WMLS:MCF

A 2 Server features

A 2.1 WMLScript Encoder Capabilities

Item	Function	Reference	Status	Requirement
WTAIIS95-ENC-S-001	Supports IS-95 Network WTA library identifier	6.2	M	WMLS:MSF
WTAIIS95-ENC-S-002	Supports IS-95 Network WTA function identifiers	6.2	M	WMLS:MSF

Appendix B. WMLScript Function Libraries (Informative)

In the table below, the WMLScript Function Libraries Calls valid for IS-95 networks are summarized. The arguments have been left out in order to increase readability. The values in the column named "Lib/Func ID" denote the *Library* and *Function IDs*.

<i>Lib/Func ID</i>	<i>WMLScript call</i>	<i>Description</i>
521.0	WTAIS95.sendText	Send an SMS message
521.1	WTAIS95.cancelText	Cancel SMS Delivery
521.2	WTAIS95.sendAck	Send a User Acknowledgement message

Table 1 , WMLScript Functions

Appendix C. Change History (Informative)

Type of Change	Date	Section	Description
Class 0	08-Sep-2001		The initial version of this document.