Wireless Universal Serial Bus Specification
Errata on Revision 1.0 as of July, 2005

Agere Systems

Hewlett-Packard

Intel

Microsoft

NEC

Philips

Samsung

July, 2005

Check the http://www.usb.org website for the latest errata.

Chapter 2

Errata Title: Miss-spelled word “Bindary” in section 2.2

Background: N/A

Change: p10, Section 2.2, last bulleted paragraph in Section 2.2 must read:

- Numbers without a base indicator are in decimal. Non-decimal numbers have a base indicator appended to the value. The base indicators used in this specification are: (H - Hexi-decimal and B - Binary). Note that some examples use a (0x) prefix base indicator for Hexi-decimal values.

Errata Title: Miss-spelled word “Revsion” in section 2.3

Background: N/A

Change: p10, Section 2.3, last reference must read:

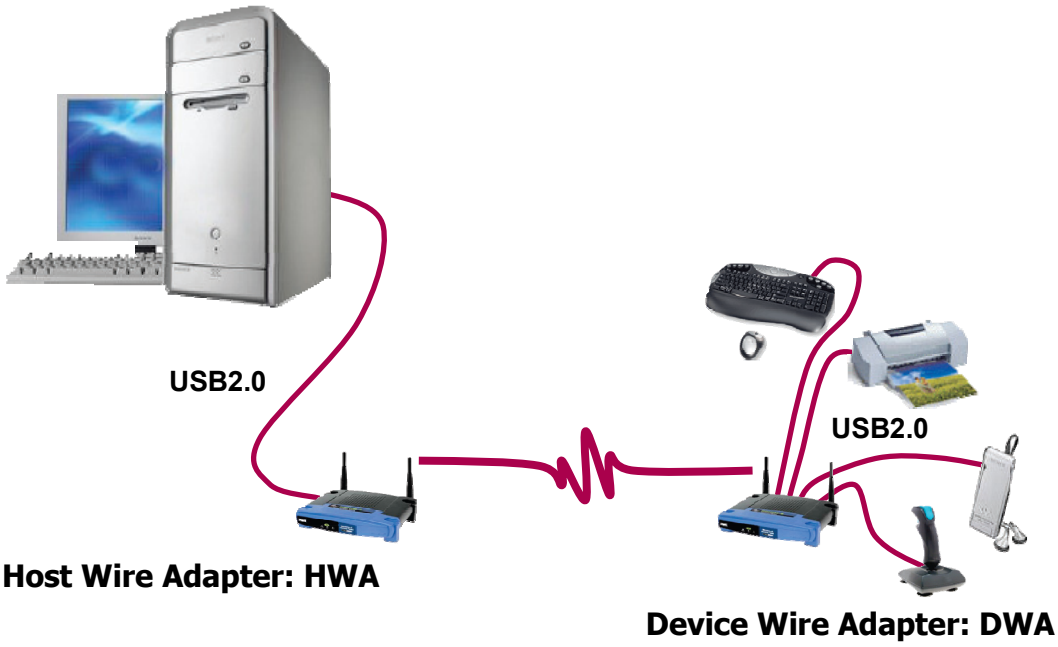
[7] *WiMedia MAC Convergence Architecture Specification* (Revision 1.0). 2005. WiMedia Alliance.

Chapter 3

Errata Title: The Host Wire Adapter in figure 3-3 should be tagged as a HWA, not a DWA.

Background: N/A

Change: p16, Figure 3-3 so it reads as follows:



Chapter 4

Errata Title: Incorrect cross-reference to packet size constraints for use of DATA_LOOPBACK_READ and DATA_LOOPBACK_WRITE.

Background: The reference is intended to direct the reader to the section(s) where scenarios where a larger than 512 byte data packet may be required with a DATA_LOOPBACK_READ or _WRITE request (where the nominal maximum packet payload for a control transfer is 512 bytes. The correct reference for this description is to Section 4.8.4.

Change: p48, Section 4.8.1, the last sentence in the 2nd paragraph must read:

These exceptions are described in detail in Section 4.8.4.

Errata Title: Table 4-4 does not have all the correct boxes shaded for required implementations.

Background: One purpose of table 4-4 is to illustrate all of the power control settings that are required to be implemented. The table as written is inconsistent and incorrect because it does not properly indicate all of the power settings that are required to be implemented by all WUSB devices.

Change: p52, Section 4.10.1, Table 4-4 should appear as follows:

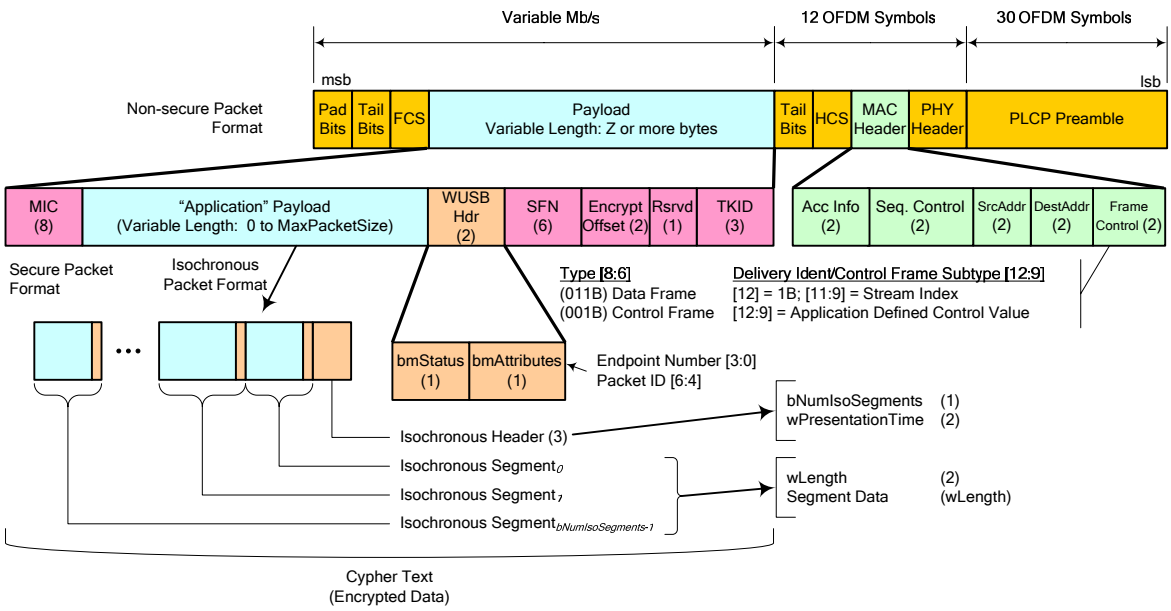
Power Control Setting	TFI Channel Power Level		FFI Channel Power Level	
	Nominal values	Accuracy requirement	Nominal values	Accuracy requirement
0	TFI_BASE	TFI_BASE	FFI_BASE	FFI_BASE
1	TFI_BASE – 2 dB	TFI_BASE – (1 to 3) dB	FFI_BASE – 2 dB	FFI_BASE – (1 to 3) dB
2	TFI_BASE – 4 dB	TFI_BASE – (3 to 5) dB	FFI_BASE – 4 dB	FFI_BASE – (3 to 5) dB
3	TFI_BASE – 6 dB	TFI_BASE – (4.8 to 7.2) dB	FFI_BASE – 6 dB	FFI_BASE – (4.8 to 7.2) dB
4	TFI_BASE – 8 dB	TFI_BASE – (6.4 to 9.6) dB	FFI_BASE – 8 dB	FFI_BASE – (6.4 to 9.6) dB
5	TFI_BASE – 10 dB	TFI_BASE – (8 to 12) dB	FFI_BASE – 10 dB	FFI_BASE – (8 to 12) dB
6	TFI_BASE – 12 dB	TFI_BASE – (9.6 to 14.4) dB	FFI_BASE – 12 dB	FFI_BASE – (9.6 to 14.4) dB
7	TFI_BASE _ 14 dB	TFI_BASE – (11.2 to 16.8) dB	FFI_BASE – 14 dB	FFI_BASE – (11.2 to 16.8) dB

Chapter 5

Errata Title: Figure 5-1 needs field names updated to match the WiMedia MAC specification.

Background: The SrcID and DestID fields in the MAC header portion of figure 5-1 need to be changed to match the WiMedia MAC specification.

Change: p87, Section 5.1, Figure 5-1 must look like:



Errata Title: W_{DNTS}CTA slot times need to account for an additional MIFS time for proper operation.

Background: The Wireless USB 1.0 specification describes the duration of DNTS time slots in terms of the time needed to transmit a maximum sized notification message, plus a 1 usec guard time (to account for clock drift). The WiMedia PHY requires at least a MIFS time between packets and the DNTS message slot time boundaries do not guarantee a MIFS when messages are transmitted in adjacent slots.

Change: p98, Section 5.2.1.3, second paragraph must read as follows:

> Device Notification Time Slots are logically structured as a window of uniform sized message slots. Message slots in a DNTS are large enough for a device to transmit a maximum sized device notification, plus a mimimun inter-frame space (MIFS), plus a guard-band to allow for local device clock drift. The W_{DNTS}CTA describing a DNTS instance includes the number of message slots in the instance.

Change: p116, Section 5.6, Table 5-11, entry for $\mathbf{t_{NOTIFICATIONSLOT}}$ must read as follows:

Duration of time slot for a maximum sized notification message.	$\mathbf{t_{NOTIFICATIONSLOT}}$	N/A	26	µs

Errata Title: Cross-reference to transmit power section is incorrect.

Background: In section 5.2.1.2 the paragraph describing the bmTXAttributes.Transmit Power field references the Bit Rate Adjustments section, not the Transmit Power Adjustments section.

Change: p98, Section 5.2.1.2, the third paragraph from the top of the page must read:

The *bmTXAttributes.Transmit Power* field is used to specify the transmit power level the device must use to transmit all of the data packets during the associated data phase protocol time slot. In general, a value of zero (0) selects the highest power setting and a value of seven (7) selects the lowest. Refer to Section 4.10.1 for details.

Errata Title: Definition of $\mathbf{t_{BUSTURNINTERSLOTTIME}}$ is inconsistently defined in Table 5-11.

Background: The bus turn inter-slot time definition needs to include a SIFS time (which allows the host to turn its radion around (transmit to receive, or visa-versa)), plus a calculated guard time (to account for device clock drift). Table 5-11 is inconsistent in the MAC/PHY Equivalent field for $\mathbf{t_{BUSTURNINTERSLOTTIME}}$ because it lists only the SIFS time.

Change: p116, Section 5.6, Table 5-11, entry for $\mathbf{t_{BUSTURNINTERSLOTTIME}}$ must read as follows:

Minimum Inter-slot time (bus turn)	$\mathbf{t_{BUSTURNINTERSLOTTIME}}$	SIFS + $t_{GUARDTIME}$	$t_{BUSTURNTIME} + t_{GUARDTIME}$	µs

Errata Title: Field name reference of "More Data" bit in MAC head is incorrect with respect to the MAC specification.

Background: N/A

Change: p118, Section 5.6, table note [5] below Table 5-13 must read as follows:

[5] The MAC Layer requires data packets transmitted during a Private reservation to have the *More Frames* bit set to a one (1B).

Chapter 7

Errata Title: Use of the New Connection and Previous Device Address fields in the DN_Connect notification is ambiguous.

Background: page 187, the first paragraph below the Table 7-56, "When the bmAttributes.New Connection field is set to a one, then the bmAttributes.Previous Device Address field must be set to 00H. Otherwise, bmAttributes.Previous Device Address is set to the last address explicitly assigned to the device by this host." I'm not sure if this is correct because I think the device sets the Previous Device Address to a zero and the New Connection bit to a zero when it makes a connection to a host that it has a connection context for, as described in the first sentence in Section 7.6.1.1.

Change: p187, Section 7.6.1, replace the paragraph diretly below table 7-56 with the following:

To make a New Connect request, the device must set the *bmAttributes.New Connection* field to a one (1B) and the *bmAttributes.Previous Device Address* field must be set to a 00H. To make a Connect request, the device must set the *bmAttributes.Previous Device Address* field to a 00H and the *bmAttributes.New Connection* field to a zero (0B). To make a Reconnect request, the device must set the *bmAttributes.Previous Device Address* field to the last address explicitly assigned to the device by this host and the *bmAttributes.New Connection* field must be set to a zero (0B).

Errata Title: Use limitation of Set Connection Context request is inaccurate.

Background: page 158, section 7.3.2.5.4 Set Connection Context, states: "This request is only valid for devices in the Authenticated device state". This is not completely accurate due to the way device states are actually defined. The real requirement is that a 4-way handshake must be completed (successfully) before this request can be used. Deletion of the offending sentence is an adequate remedy because the usage restrictions are clearly called out in the subsequent portion of the section.

Change: p158, Section 7.3.2.5.4, first paragraph (under request format table), delete the 2nd sentence. The result must as follows.

This command is used to modify the current device connection values for CHID, CDID, and CK. A Connection Context must always be protected during delivery.

Chapter 8

Errata Title: Unsecured Control Transfer

Background: page 213, Table 8-10. There is currently no way to inform the HWA to perform an unsecured control transfer to the device after setting a valid encryption and key for the device.

Change: p213, Table 8-10, entry for bmAttributes must be changed as follows:

13	*bmAttribute*	1	Bitmap	**Bit**	**Description**
				0	Control Transfer direction
					Value **Meaning**
					0 Control transfer write
					1 Control transfer read
				1	Unsecured Control Transfer.
					Value **Meaning**
					0 Regular Control transfer
					1 Unsecured Control transfer
					This field is only valid for HWAs.
				7:2	Reserved, must be zero

Errata Title: Set ISO EP Attributes – clarification of when it can be sent to a DWA

Background: N/A

Change: p231, Section 8.4.4.3, add the following text before the last paragraph:

If the RPipe that is currently configured for this endpoint in not in the Idle state, the Device Wire Adapter's response to this request is undefined.

Errata Title: HWA RPipe Descriptor – Burst Size

Background: page 241, Table 8-49. There is currently no way to inform the HWA of the burst size in the RPipe descriptor. This is required so that the HWA can determine the maximum burst size supported by the endpoint when performing transactions to that endpoint. In addition the field name for field at offset 11 has been modified to better reflect the value it represents.

Change: p241, Table 8-49, entry for offset 10 and 11 must read as follows:

10	*bMaxBurst*	1	Number	Maximum data burst size. Valid values are 1 through 16
11	*bDeviceInfoIndex*	1	Number	This field specifies the device index where the device information buffer is present.

Errata Title: Set Device Key – Clarification

Background: page 248, Section 8.5.3.8. The HWA must be able to detect that a device key is being set and not a group key. This errata addresses this issue.

Change: p248, Section 8.5.3.8. The first paragraph after the table must read as follows:

When the HWA receives this command, it uses the key data in the accompanying key descriptor to update its copy of the key to be used when sending/receiving data from this device. Host Wire Adapters are only required to support one key per device. The upper byte of *wValue* (Descriptor Type) specifies the type of descriptor being set and the lower byte specifes the Key Index. Bits 4 and 5 of the Key Index field must be set to zero to inform the HWA that a device key is being set.

Errata Title: Set Group Key – clarification

Background: N/A

Change: p249, Section 8.5.3.9. The first paragraph after the table must read as follows:

When the HWA receives this command, it uses the key data in the accompanying key descriptor to update its copy of the Group key to be used when sending data to the WUSB cluster.The upper byte of wValue (Descriptor Type) specifies the type of descriptor being set and the lower byte specifes the Key Index. Bits 4 and 5 of the Key Index field must be set to two.

Errata Title: Source Address of the device sending a notification missing in Device Notification information sent to host from an HWA

Background: page 251, Table 8-56. Host software has no way of identifying the source of the device notification when it recevices a DN Received Notification from an HWA.

Change: p251, Table 8-56 must be replaced with the following table:

Offset	Field	Size	Value	Description
0	*bLength*	1	Number	Length of this block of data
1	*bNotifyType*	1	95H	NOTIFY_TYPE_DN_RECEIVED
2	*bSourceDeviceAddr*	1	Number	The address of the device that sent this device notification
3	*bmAttributes*	1	Bitmap	**Bit** **Description** 6:0 Reserved 7 This bit is set if this notification was received as a secure frame.
4	*NotificationSpecific*	Variable	Raw Data	The device notification received. The HWA is responsible for decrypting the notification if it was a secure frame. See Section 7.6 for the various notifications that an HWA may receive.

Errata Title: Device Address Management RCEB – incorrect direction bit setting

Background: page 261, Table 8-73. The specification incorrectly states that the baAddr field contains the returned address information when the direction bit in the RCCB is set to a one.

Change: p261, Table 8-73, must be replaced with the following table:

Offset	Field	Size	Value	Description
0	*bEventType*	1	0	GENERAL Event Type
1	*wEvent*	2	17	Result of DEV_ADDR Command
3	*bEventContext*	1	Number	This should match the *bCommandContext* in the RCCB.
4	*baAddr*	8	Byte array	This field contains the returned address information if the *Set* bit in the associated RCCB is set to zero, otherwise it will be ignored.
12	*bResultCode*	1	Number	Indicates the completion status of the command. See Table 8-69 for a list of result codes.

Errata Title: Get IE– change to reflect updated Wimedia MAC specification

Background: N/A

Change: p261, Section 8.6.2.3. The second paragraph must read as follows:

If the device is not beaconing then it must return the IEs that have been set by the host by a previous Set IE command. If the host has not set any IEs then the device must return the local device MAC Capabilities IE and PHY Capabilities IE.

Errata Title: Set DRP IE – Explict DRP IE handling

Background: The current specification states that the device must replace all DRP IEs that it is currently sending when it recives the next Set DRP IE. This does not allow host software to correctly handle explicit DRP negotiations. To fix this issue, the device must not replace the the current DRP IEs in its beacon if it receives a Set DRP IE with the bExplicit flag set.

Change: p265, Section 8.6.2.7. The first paragraph after the table must read as follows:

The *IEData* field in this command is the DRP IE data to be added to the beacon if the *bExplicit* flag is not set. The length of the *IEData* field is specified by *wIELength*. The device must replace the DRP IEs that it is currently sending with the DRP IEs specified in this command if the *bExplicit* flag is not set. If *wIELength* is set to zero, then the device will remove any existing DRP IEs from its beacon.

Errata Title: Host Settable IEs – change to reflect updated WiMedia MAC specification

Background: N/A

Change: p267, Table 8-85 must be replaced with the following table:

IE Name	Notes
BP Switch IE	Used by Wireless USB
MAC Capabilities IE	
PHY Capabilities IE	
Identification IE	
PCA Availability IE	
Application-specific Probe IE	
Master Key Identifier (MKID) IE	
Application Specific IE (ASIE)	
Relinquish Request IE	
Multicast Address Binding IE	

Errata Title: Beacon Size Notification– missing “Change”

Background: N/A

Change: p273, Section 8.6.3.3. “Beacon Size Notification" must be replaced with "Beacon Size Change Notification"

Errata Title: DRP Availability Change– incorrect spelling

Background: N/A

Change: p258, Table 8-68 and p275, Table 8-104. “DRP_AVAILABITY_CHANGE" must be replaced with "DRP_AVAILABILITY_CHANGE"

Errata Title: Start Beaconing – Usage of BPST Offset field

Background: The BPST Offset usage as specified in the specification is incorrect.

Change: p270, Section 8.6.2.12. The first paragraph after the table must read as follows:

The *bChannelNumber* field value is the physical layer channel on which beaconing will begin. The device must join the beacon group that is identified by *wBPSTOffset.* Host software must set the value in the *BPST Offset* field to the STC value which corresponds to the beacon period start time of the beacon group that it wants the device to join.

Appendix A

Errata Title: A.1 test vector is missing a byte

Background: N/A

Change: p.277, Section A.1, Host Nonce should have a '1E' as the 2nd to last byte. The table must be replaced with the following:

Inputs	
Host Address	9876
Device Address	00BE
TKID	019876
Host Nonce	10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
Device Nonce	20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
CK	F0 E1 D2 C3 B4 A5 96 87 78 69 5B 4B 3C 2D 1E 0F
Results	
KCK	4B 79 A3 CF E5 53 23 9D D7 C1 6D 1C 2D AB 6D 3F
PTK	C8 70 62 82 B6 7C E9 06 7B C5 25 69 F2 36 61 2D

Errata Title: MIC values for A.3 are incorrect

Background: N/A

Change: p278, Section A.3, the table must be replaced with the following:

Inputs	
Host Address	9876
Device Address	FFFF
TKID	019876
KEY	C8 70 62 82 B6 7C E9 06 7B C5 25 69 F2 36 61 2D
SFC	001122334455
Packet	40 1C FF FF 76 98 00 00 00 80 (MAC Header) 00 01 01 23 00 00 00 0F 0E 0D (MMC Header) 0A 80 (WCTA IE header) 80 10 00 0C (WdntsCTA) 00 00 01 FF (end of list) 14 82 49 00 (Host Info IE) A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF
EO	28 (l(m)= 0, l(a) = 36)
Results	
MAC HDR	48 1C FF FF 76 98 00 00 00 80
Security Hdr	76 98 01 00 28 00 55 44 33 22 11 00
Payload	00 01 01 23 00 00 00 0F 0E 0D 0A 80 80 1000 0C 00 00 01 FF 14 82 49 00 A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF
MIC	F8 9A 72 B0 33 C0 9D 55

Errata Title: MIC values for A.4 are incorrect

Background: N/A

Change: p279, Section A.4, the table must be replaced with the following:

Inputs		
Host Address	9876	
Device Address	0002	
TKID	019876	
KEY	C8 70 62 82 B6 7C E9 06 7B C5 25 69 F2 36 61 2D	
SFC	001122334456	
Packet	C0 12 76 98 02 00 00 00 23 C1	(MAC Header)
	81 00	(WUSB Header)
	30 31 32 33 34 35 36 37	(data)
	38 39 3A 3B 3C 3D 3E 3F	
	40 41 42 43 44 45 46 47	
	48 49 4A 4B 4C 4D 4E 4F	
EO	02	(l(m)= 20, l(a) = 10)
Results		
MAC HDR	C8 12 76 98 02 00 00 00 23 C1	
Security Hdr	76 98 01 00 02 00 56 44 33 22 11 00	
Payload	81 00 41 3A 31 85 C9 85 1B F5 46 E7	
	C5 93 03 11 85 76 47 ED 9D 95 15 A6	
	99 CF 47 79 CE C8 6E B0 AD 1D	
MIC	FD F4 53 64 E2 45 91 F4	

Appendix B

Errata Title: Incorrect field value for wMaxPacketSize in endpoint descriptor (pg 292)

Background: N/A

Change: p.292, Section B.2, the last endpoint descriptor on the page must have a wMaxPacketSize field that reads as follows:

wMaxPacketSize	40H

Errata Title: Incorrect field value for bMaxPacketSize0 in Device_Qualifier descriptor (pg 286)

Background: N/A

Change: p.286, Section B.2, the last device_qualifier descriptor on the page must have a bMaxPacketSize0 field that reads as follows:

bMaxPacketSize0	40H

Errata Title: Incorrect field value for bMaxPacketSize0 in Device_Qualifier descriptor (pg 285)

Background: N/A

Change: p.285, Section B.2, the first device descriptors after the start of section B.2 must have a bMaxPacketSize0 field that reads as follows:

bMaxPacketSize0	40H