

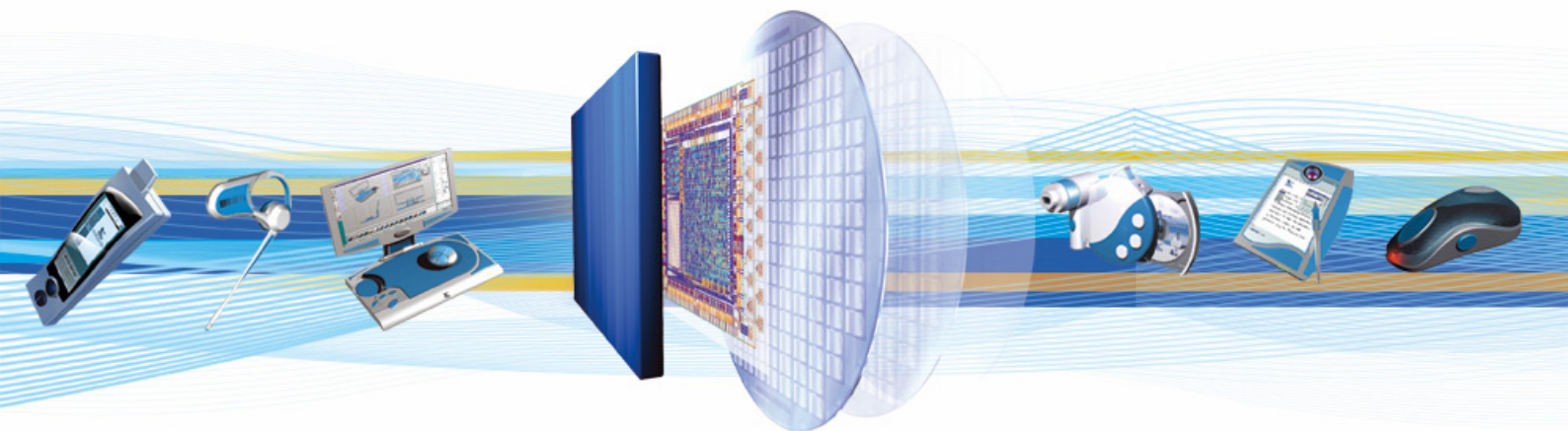


**BlueLab™**

BlueLab v3.6

Software Release Note

December 2006



**CSR**

Cambridge Science Park  
Milton Road  
Cambridge CB4 0WH  
United Kingdom

Registered in England 4187346

Tel: +44 (0)1223 692000

Fax: +44 (0)1223 692001

[www.csr.com](http://www.csr.com)

# Contents

<b>1</b>	<b>Introduction</b> .....	<b>3</b>
1.1	BlueLab3 .....	3
1.2	BlueLab v3.6.....	3
1.3	New Features in v3.6 Relative to v3.5 .....	4
1.4	Requirements .....	4
<b>2</b>	<b>CSR Chips</b> .....	<b>5</b>
<b>3</b>	<b>Release Functionality</b> .....	<b>6</b>
3.1	xIDE .....	6
3.2	Toolchain .....	6
3.3	Support Libraries .....	6
3.4	Application Libraries .....	6
3.5	Kalimba DSP Libraries .....	7
3.6	Example Applications .....	7
<b>4</b>	<b>Firmware</b> .....	<b>9</b>
<b>5</b>	<b>Major Changes in BlueLab3 Relative to BlueLab2</b> .....	<b>10</b>
5.1	Tool Changes .....	10
5.2	Library Changes .....	10
5.3	Application Changes .....	10
<b>6</b>	<b>Testing</b> .....	<b>11</b>
<b>7</b>	<b>Document References</b> .....	<b>12</b>
<b>Appendix A</b>	<b>Known Issues</b> .....	<b>13</b>
<b>Appendix B</b>	<b>Issues Resolved in BlueLab v3.6</b> .....	<b>17</b>
<b>Appendix C</b>	<b>Issues Resolved in BlueLab v3.5</b> .....	<b>24</b>
<b>Appendix D</b>	<b>Issues Resolved in BlueLab v3.4</b> .....	<b>31</b>
<b>Appendix E</b>	<b>Issues Resolved in BlueLab v3.3</b> .....	<b>38</b>
<b>Appendix F</b>	<b>Issues Resolved in BlueLab v3.2</b> .....	<b>45</b>
<b>Appendix G</b>	<b>Issues Resolved in BlueLab v3.1</b> .....	<b>56</b>
	<b>Terms and Definitions</b> .....	<b>58</b>
	<b>Document History</b> .....	<b>60</b>

## List of Tables

Table A.1:	Known Issues .....	14
Table A.2:	Known Issues (xIDE) .....	15
Table A.3:	Missing Features .....	16
Table A.4:	Known Issues in BlueSuite v1.23 Tools Shipped with BlueLab v3.6.....	16
Table B.1:	Issues Resolved in BlueLab v3.6 .....	22
Table B.2:	Summary of BlueSuite v1.23 Resolved Issues .....	23
Table C.1:	Issues Resolved in BlueLab v3.5.....	30
Table D.1:	Issues Resolved in BlueLab v3.4.....	37
Table E.1:	Issues Resolved in BlueLab v3.3.....	44
Table F.1:	Issues Resolved in BlueLab v3.2 .....	55
Table G.1:	Issues Resolved in BlueLab v3.1 .....	57

# 1 Introduction

This document describes **BlueLab™ v3.6**, the most recent release of BlueLab3, CSR's software development kit for producing embedded applications for CSR's Bluetooth® wireless technology chips. Some additional documentation is included with BlueLab; see the manual available inside xIDE, the integrated development environment for BlueLab and the accompanying PDFs.

## 1.1 BlueLab3

BlueLab3 has the same virtual machine (VM) architecture that has been successfully implemented in the vast majority of single-chip Bluetooth products, including around 80% of all headset designs. The VM isolates user code in a *sandbox* where it cannot interfere with the basic Bluetooth operation of the chip. This allows the use of pre-qualified low-level stack firmware, greatly simplifying Bluetooth qualification process and reducing time to market. The user does not need to qualify complex low-level firmware. CSR does this.

BlueLab v3.0 introduced true on-chip, real-time debugging for the first time on any Bluetooth chip. There is no need to stop the chip running to get debug data. It is possible to watch traffic in real-time while the chip runs. The development environment monitors and records messages between the VM application and the upper layers of the Bluetooth stack. The resulting record can be as useful as, but much easier to obtain than, an air trace when debugging complex problems such as interoperability between two Bluetooth devices.

These features make BlueLab3 by far the most flexible and functional set of tools available for any Bluetooth chip today.

The new tools introduced with BlueLab3 make it easier to take advantage of its much improved and expanded set of software libraries. These libraries improve performance and consistency for functions such as event handling. Crucially, they are designed from the ground up to support applications that use multiple simultaneous connections. This function is essential for cutting-edge Bluetooth products like wireless stereo headphones with call handling.

The library changes mean that applications written for BlueLab2 must be partially rewritten to run under BlueLab3. Rewriting the code need not be an arduous task because the new libraries automate many common functions. As a result BlueLab3 applications are considerably simpler than before. It is generally only necessary to write a user interface to sit above the highly functional libraries provided with the Software Development Kit (SDK).

The initial releases of BlueLab3 were focussed on wireless headphones with call handling (combined Headset/Hands-Free and Audiovisual profiles) because the ability to support multipoint connections is essential for these products.

## 1.2 BlueLab v3.6

BlueLab v3.6 consolidates the support for BlueCore5 introduced in BlueLab v3.5. It includes development quality firmware for BlueCore5-Multimedia, including all the features planned for the corresponding production firmware late in 2006.

BlueLab3 now supports more generations of BlueCore and has support for more profiles than BlueLab2, making it the preferred environment for the development of embedded applications on BlueCore.

### 1.3 New Features in v3.6 Relative to v3.5

In addition to the changes listed in Appendix B BlueLab v3.6 introduces the following new features:

- Application changes:
  - The `stereo_headset` reference application now supports eSCO and the DEV-PC 1645 development board.
  - PBAP example applications have been added.
- Tool enhancements:
  - VM library and object files are now much smaller, reducing both disk space and build times.
  - xIDE now loads VM debug symbols more quickly.
  - Significant improvements have been made to build times for large DSP applications.
- Kalimba DSP library changes:
  - Further improved support for Bluecore5-Multimedia as well as Bluecore3-Multimedia in the DSP libraries.
  - Additions to the flash library to be able to request the flash address of a file in the file-system given its VM file handle.
  - The message library now supports explicitly sending a long or short message. This frees up a little more program memory (PM) in applications that don't need to send long messages.

### 1.4 Requirements

This release of BlueLab runs on machines operating on Windows 2000 SP4 or later and Windows XP SP1 or later.

A minimum of 256MB memory (RAM) is required for satisfactory performance. However, CSR recommend running BlueLab on a machine with 512MB (RAM) or more

The development tools access BlueCore through the Serial Peripheral Interface (SPI); therefore, a board supporting this (such as Casira™ or other CSR development board) is also required.

## 2 CSR Chips

Applications produced with this development kit will run on CSR's **BlueCore3, BlueCore4** and **BlueCore5** chips, with a firmware build supporting Virtual Machine (VM) v7.5. Suitable production firmware for these chips is expected during late 2006 (from the 22.x branch and later.)

Applications can also be built for BlueCore2, but this release of BlueLab does not include firmware for BlueCore2. The last planned production firmware release supporting BlueCore2 was 21f, which supports VM v7.5 under the restrictions outlined in the 21f release note.

**Notes:**

The firmware builds supplied with this release all require minimum 6Mbit devices. See Table A.1.

## 3 Release Functionality

### 3.1 xIDE

This release of BlueLab includes CSR's integrated development environment, xIDE, supporting development and debugging of both VM applications (in C) and Kalimba DSP code (in assembler).

### 3.2 Toolchain

BlueLab includes a set of development tools for VM applications:

- Compiler based on GCC v3.3.3 and targeting the BlueCore VM
- Supporting assembler, librarian and linker
- Libraries providing access to BlueCore specific features
- Libraries providing implementations of selected standard ANSI functions

BlueLab also includes development tools for Kalimba DSP applications written in assembler:

- Assembler, with linking ability
- Tools for embedding Kalimba DSP applications and data in BlueCore's read-only file system
- Libraries providing commonly required services
- Matlab tools to aid debugging of Kalimba DSP applications and libraries

Additional tools (from BlueSuite™) are provided for downloading applications and updating the Persistent Store.

### 3.3 Support Libraries

In addition to the standard libraries, BlueLab includes libraries specific to BlueCore and Bluetooth:

- Battery library sampling voltage level
- Message library for splitting applications into communicating tasks
- Panic library for detecting errors and terminating the application
- Service and region libraries for searching SDP records
- MD5 library to support authentication in PBAP (Phonebook Access Profile)

### 3.4 Application Libraries

The following libraries build on BlueStack to simplify the production of Bluetooth applications:

- Connection library
  - Can create RFCOMM, L2CAP and SCO connections
  - Manages security settings and link policy
- AV profile libraries supporting applications using the Bluetooth AV profiles
- HFP library supporting applications using the headset and hands-free profiles
- SPP library supporting applications using both roles of the serial port profile
- GOEP library supporting the client and server role of the generic object exchange profile underlying OBEX
- FTPC and FTPS libraries implementing the client and server side of the file transfer profile using GOEP
- OPPC and OPPS libraries implementing the client and server side of the object push profile
- AGHFP library supporting the audio gateway profile

- HID library supporting the human interface device profile
- DUN library supporting the dial up networking profile
- PBAP library supporting the phonebook access profile

### 3.5 Kalimba DSP Libraries

- Core library – basic low-level routines:
  - Timers
  - Messages (now includes long message support)
  - Interrupts
  - Connection buffers
  - cbuffer operators (`cbops`) library: handles copying of data from a source buffer to a destination buffer with optional processing of the data in a simple *linked list of operators-type* way
  - Profiling
  - Flash access (functions to aid reading of flash memory from the DSP), also running code from flash on Bluecore5-Multimedia
  - PS key reading from the DSP
- Audio compression CODEC libraries
  - sbc library: mandatory CODEC SBC (Sub-band Coding), both encoder and decoder, for the Bluetooth AV profiles.
  - mp3 library: an mp3 decoder supporting the lower sample rate extensions of MPEG2/2.5
- codec library: handles streaming audio over Bluetooth using the selected audio compression CODEC (sbc, mp3 etc)
- Math library: optimised `fft`, `ifft`, `sin`, and `sqrt` functions
- sco\_process library: eases the creation of applications that handle the processing of SCO audio streams

### 3.6 Example Applications

The following example applications are supplied.

**Note:**

These are for demonstration purposes only and are intended as the starting point for customers' development effort.

**On multimedia variants of BlueCore**

- `stereo_headset` application implementing both a headset and a stereo AV sink, including an evaluation implementation of cVc (Clear Voice Capture) echo cancellation and noise reduction software.

**Note:**

The `stereo_headset` application can be configured for use with DEV-PC1645, DEV-PC1508 and DEV-PC1442 development boards.

- `a2dp_source_dongle` implements an AV source, taking audio from one of:
  - internal stereo CODECs
  - an external Wolfson CODEC
  - USB, enumerating as USB speakers

### Targeting BlueCore3-Audio Flash and BlueCore4-Audio Flash

- `headset` application implementing a mono headset.

#### Note:

It is also possible to use this application on older BlueCore variants, but modifications will be required to remove calls to support the charger and other features which are specific to these versions of BlueCore.

### Targeting BlueCore variants running HID or unified versions of Firmware

- `hid_mouse`
- `hid_keyboard`
- `hid_dongle`

#### On all variants of BlueCore:

- `spp_dev_a` and `spp_dev_b` implementing role A, or role B, of the serial port profile
- `ftp_server`
- `obex_server`
- `opp_server`
- `pbap_client`
- `pbap_server`

Example applications are also provided demonstrating:

- routing of SCO data through the Kalimba DSP: `sco_dsp` and `sco_master` applications
- use of the SBC encoder and decoder libraries: `test_sbclloopback` application
- use of the mp3 decoder library: `test_mp3decoder` application
- sending long messages between the Kalimba DSP and VM: `kalimba_long_message_example` application
- accessing flash memory from the Kalimba DSP: `kalimba_flash_access_example` application
- generating of test tones: `test_tonegen` application
- use of the FTPC, GOEP and OPPC libraries: `ftpc`, `goep`, and `oppc` applications



## 4 Firmware

CSR’s policy is to distribute, with BlueLab, a selection of firmware builds whose sole purpose is the development of applications. Before going into production the developer must obtain from CSR Bluetooth-qualified production firmware (which they can use in place of the development firmware supplied with BlueLab). This is a mandatory part of the qualification process.

This release of BlueLab v3.6 includes development firmware for use with BlueCore3-Audio/Flash, BlueCore3-Multimedia, BlueCore4-External, BlueCore4-Audio/Flash and BlueCore5-Multimedia. See Table A.1:

Firmware name	Hardware	Flash Size	Space in filesystem	HID	RFCOMM	DFU
unified_kalimba	BC3-multimedia	8Mbit	148Kw	Yes	Yes	Yes
enhanced_kalimba <sup>(1)</sup>	BC3-multimedia	8Mbit	144Kw	Yes	Yes	Yes
unified_coyote	BC4-external	8Mbit	148Kw	Yes	Yes	Yes
compact_paddywack	BC3-audio flash	6Mbit	128Kw	No	Yes	No
hid_paddywack	BC3-audio flash	6Mbit	140Kw	Yes	No	No
compact_jumpinjack	BC4-audio flash	6Mbit	116Kw	No	Yes	No
hid_jumpinjack	BC4-audio flash	6Mbit	128Kw	Yes	No	No
unified_elvis	BC5-multimedia	8Mbit 16Mbit 32Mbit	156Kw (+1024Kw) (+3072Kw)	Yes	Yes	Yes
<sup>(1)</sup> This enhanced firmware has partial support for EDR but cannot be qualified to the v2.0 + EDR Bluetooth Specification.						

**Table A.1: Development Firmware Included with BlueLab v3.6**

**Notes:**

The hardware type is detected automatically by xIDE, unless explicitly set for the project.

Choose between compact, unified, hid and enhanced firmware by using the project properties within xIDE.

BlueLab applications are limited to, at most, 64Kw of code space and 24Kw of constants; they must also fit in the read-only file system along with other files used by the application, such as any DSP code used by multimedia applications.

Available space in the filesystem may decrease between development firmware provided with BlueLab and the corresponding production firmware.

Customers using early revision-A samples of BlueCore5-Multimedia should upgrade to revision-B. The firmware supplied with BlueLab 3.6 does not work on rev-A parts. If automatic hardware detection is used with rev-A parts, BlueLab reports that it cannot find suitable firmware.

See also the notes in section 2.

## 5 Major Changes in BlueLab3 Relative to BlueLab2

BlueLab3 builds on many years of experience with BlueLab1 and BlueLab2. Many components have been redesigned and replaced to make it easier and faster to build the sort of applications CSR's customers are now working on.

### 5.1 Tool Changes

The most visible change in BlueLab3 is the addition of xIDE, a complete integrated development environment. xIDE allows projects to be created, code to be edited, VM applications to be compiled, and Kalimba DSP code to be assembled within a single environment.

xIDE replaces the Java-based appdebug from BlueLab2. It also replaces the Matlab-based kaldbg which was provided as part of BlueLab v2.85 and later. The requirement to install Cygwin and Java has also been eliminated.

xIDE supports on-chip debug of applications over BlueCore's SPI debug interface, making it possible to debug applications which take control of the USB or UART interface on BlueCore. Such applications include serial-cable replacement and USB dongles.

The Matlab-based kalasm from BlueLab2.85 and later has also been replaced by a new version, kalasm2.

A new C compiler based on gcc3.3.3 has replaced the gcc 2.95 compiler used in BlueLab2 and typically yields a 10% improvement in code density.

### 5.2 Library Changes

The most significant change in BlueLab3 is the introduction of the new connection library which supports any combination of RFCOMM, L2CAP and SCO connections (and, soon, TCP and UDP) serving multiple profiles. For example, a single application implementing both AV and HF profiles is now possible. (The single connection and single profile limitations imposed by the `cm_rfcomm` library in BlueLab2 no longer apply.)

The lower level libraries have been completely rewritten to support the new connection library. Notification of asynchronous events, either from the firmware or from lower-level libraries, is now uniformly handled by the delivery of messages. Tasks are now dynamically created and combine message handlers with local state. The scheduler library in BlueLab2 has been replaced by a simplified message loop, cutting latency on message delivery by a factor of five.

The upper level libraries, which correspond to Bluetooth profiles, have also been completely rewritten as tasks which use the new connection library. This makes it possible to combine multiple profiles in a single application. For example an application can now open multiple SPP connections simply by creating multiple instances of the SPP profile.

### 5.3 Application Changes

BlueLab2 and BlueLab3 applications look significantly different. In general a BlueLab3 application is much simpler than the corresponding BlueLab2 application, especially when multiple connections or profiles are being used. A typical BlueLab3 application simply arbitrates between the user-interface logic and the profile instances it creates.

However, the extensive changes to the libraries make it impractical for the same code to work with both BlueLab2 and BlueLab3. An existing BlueLab2 application will have to be partly rewritten to work with BlueLab3.

## 6 Testing

BlueLab v3.6 has been in use within CSR throughout its development. Furthermore, explicit testing has covered:

- Installation (and de-installation) on all supported platforms
- Component testing of the `connection` library and profile libraries
- Tools shared with the BlueSuite 1.23 release including PSTool and BlueFlash
- Testing of BlueStack, the firmware layers above HCI including RFCOMM and L2CAP

Appendix A lists known issues. CSR welcomes reports of any additional issues through official support channels.

## 7 Document References

Document:	Reference, Date:
Specification of the Bluetooth System	Core Specification v2.0 + EDR 4 November 2004
Headset Profile	Headset Profile Part K:6, v1.1, 22 February 2001
Hands-free Profile	Hands-free Profile, v1.0, 29 April 2003
<i>BlueSuite v1.23 Software Release Note</i>	CSR reference CS-110443-RN
<i>a guide to BlueLab Command Line Tools</i>	CSR reference CS-101506-UG

## Appendix A Known Issues

This section lists currently known issues for BlueLab v3.6. The Severity column gives a subjective assessment (Cosmetic, Minor, Major) of how severely each issue may affect the use of BlueLab v3.6.

The following items are known problems with the functionality of components which are new to BlueLab3.

ID	Severity	Description
B-2844	Minor	It is not currently possible to build a BlueLab library from within xIDE; this must be done using the shortcut placed in the Start Menu, or Makefiles from the command line.
B-3740	Minor	If an error occurs while building the BlueLab libraries from the start menu, the window is closed losing the error messages. (Invoking the same command from the command-line is an effective workaround.)
B-4221	Minor	BlueLab3 is missing library routines necessary to handle long long types.
B-4222	Minor	gcc3 -O2 and -O3 optimisation levels are known to generate incorrect code.
B-4264	Cosmetic	Installing exactly the same version of BlueLab twice, then attempting to uninstall can leave orphaned shortcuts on the system.
B-4314	Minor	The <code>a2dp_source_dongle</code> application can sometimes take longer than the mandated 100ms to respond to an AVRCP transaction when streaming audio.
B-4315	Major	The <code>a2dp</code> library only supports one active stream endpoint.
B-4408	Minor	The <code>connection</code> library does not currently handle TCP or UDP connections.
B-5017	Minor	The L2CAP handler does not currently handle configuration messages which use the <code>more_data</code> flag; this is minor since all L2CAP configurations fit into a single MTU.
B-5608	Major	Stream connections using a file as their source are terminated when the source file is empty not when the last of the data has been read from the connection. This makes it impossible for the Kalimba DSP to read the last few hundred bytes of data from a file.
B-6228	Minor	Security in the connection library is currently configured globally or by service. Per device settings are not yet supported.
B-7051	Minor	In certain functions, the debug information output by gcc is incomplete, leading to function arguments sometimes not being available in the variables widget in xIDE until some way through the function.
B-7645	Major	The <code>a2dp_source_dongle</code> application does not enter DFU mode.
B-8354	Minor	The <code>a2dp</code> library is coupled to the multimedia versions of BlueCore; it currently assumes that it should check for DSP CODECs in the filesystem and load them onto the DSP as required.
B-8564	Minor	xIDE strips path components from source files when generating makefiles, which means that all project files must be in the same directory.
B-8714	Minor	Sometimes bitfield values can be displayed incorrectly in xIDE.
B-8861	Minor	xIDE should provide a way of merging the application and firmware without requiring the appropriate hardware to be connected over SPI and then flashing it.
B-8888	Minor	If extra indicator reporting is enabled in the <code>hfp</code> library, the initial values of the extra indicators are not sent to the client.
B-9877	Minor	If the VM project is not before any Kalimba projects in a workspace, the Kalimba debugger may not operate.
B-10894	Minor	The connection library does not directly support <code>DM_HCI_READ_REMOTE_VERSION_COMPLETE</code> .
B-11093	Minor	The message <code>CL_SM_ENCRYPTION_CHANGE_IND</code> is unhandled which causes a Panic in the debug build of the <code>gavdp</code> library.
B-11271	Minor	The Kalimba in BlueCore3 does not allow the last instruction in a <code>DoLoop</code> to be a function call, as this is only supported in BlueCore5. However, no warning is given when the target device is BlueCore3.

ID	Severity	Description
B-11616	High	The experimental <code>StreamEnableSniffSubrating</code> call present in BlueLab3.3 is not supported in the firmware supplied with BlueLab3.4 or later. Applications calling this trap will not run with the supplied firmware.
B-12630	Minor	The <code>CodecSetInput/OutputGain</code> functions on BlueCore5-Multimedia produce the same gain settings as on BlueCore3 and BlueCore5. The finer control described in the BlueCore5-Multimedia databook is only currently available using the <code>CodecSetRaw</code> functions.
B-13391	Minor	The firmware for BlueCore5-Multimedia supplied with BlueLab 3.5 and BlueLab 3.6 does not include PAN support (other builds may include it, but B-4408 makes it inaccessible.)
B-14511	Major	If using the BlueTunes development board (DEV-PC_1508) the audio amplifier must be explicitly enabled by the application. The <code>test_tonegen</code> example (and other audio applications) need to be updated otherwise the application will run but audio will not be heard. The following lines should be added to the application in order to enable the audio amplifier.  <pre>#define AUDIO_AMP_LINE (1&lt;&lt;4) PioSetDir(AUDIO_AMP_LINE, AUDIO_AMP_LINE); PioSet(AUDIO_AMP_LINE, AUDIO_AMP_LINE);</pre>
B-14655	Low	If PSTool loses contact with the chip when performing a key dump, PSTool may crash.
B-17059	Minor	BlueLab v3.6 does not include firmware for early revisions of BlueCore5-Multimedia. If such chips are detected, xIDE now reports that suitable firmware cannot be found.
B-17075	Minor	BlueLab no longer includes firmware for BlueCore2 parts. The last production firmware for these parts comes from the 21 branch and is only partly compatible with BlueLab v3.6.
B-17158	Minor	A SCO loop through cannot be performed by directly connecting a <code>ScoSource</code> to a <code>ScoSink</code> . It is however, possible to connect the <code>ScoSource</code> and <code>ScoSink</code> to the DSP and have it copy data between them.
B-17938	Minor	The <code>StreamEnableSniffSubrating</code> function is not supported in current firmware and will be removed in a future version of BlueLab.
B-18765	Minor	The default configuration for the <code>stereo_headset</code> reference application supplied with this release is intended to run on a BlueCore5-Multimedia DEV-1645 development board. The configuration needs changing before the application will work on other boards.
B-18766	Minor	Firmware limitations prevent a VM application from registering large USB descriptors. Behaviour becomes erratic for descriptors larger than approximately 256 bytes.
B-18848 (formerly SEP-16)	Minor	The remote control functionality of the <code>a2dp_source_dongle</code> does not work with MacOS X. This is because MacOS does not natively support the required HID events. It is possible, however, to write a MacOS driver to implement this functionality.
B-19036	Minor	<code>Buttonparse</code> does not include PIO 0 if it is defined as a <code>pio_raw</code> event.
B-19303	Low	The <code>stereo_headset</code> application supplied with BlueLab v3.6 no longer has a configuration supporting the 1307 development board.

**Table A.1: Known Issues**

The following items are known problems with xIDE.

ID	Severity	Description
M-391	Cosmetic	After an application panic, it's still possible to click step and run in xIDE but they return error messages.
M-406	Minor	Stepping over <code>MessageLoop</code> causes xIDE to stop responding until a message is received.
M-452	Minor	xIDE has excessive PC CPU usage while polling a running VM application.

ID	Severity	Description
M-467	Minor	Stopping xIDE while firmware is being downloaded leaves a stray BlueFlashCmd.exe process running.
M-563	Minor	If auto-indent is enabled then xIDE can incorrectly indent lines when Undo is used.
M-582	Cosmetic	xIDE sometimes starts with a window partially off the screen; a workaround is to right-click on xIDE in the task bar and select Move, bringing the window back on screen using the cursor keys.
M-607	Minor	If local and global variables have the same name, then xIDE only displays one of them while debugging a VM application.
M-704	Minor	The Stop-Build button produces strange results if pressed during start-up of a Kalimba project.
M-745	Minor	Using F4 in xIDE to go to the next error does not restart from the top of the list of errors after rebuilding the application.
M-754	Minor	Single stepping through single instruction do loops performs three instructions on each step.
M-769	Minor	If xIDE is closed while it's switching to debug mode, it crashes with a memory error.
M-772	Minor	Batch build builds the active configuration several times, rather than building all the different configurations.
M-815	Minor	Pressing F4 in xIDE to go to the next error can be confused by errors which actually occur in included files.
M-837	Major	If VM memory or register widgets are opened after a panic, they display all zeros. To work around this problem, click show next statement on the debug menu after opening the widgets.
M-842	Minor	Search and replace can take several minutes to complete for a few thousand replacements.
M-872	Minor	Running or stepping from a kalimba break instruction at the end of do...loop block may not work as expected.
M-873	Minor	Writing a kalimba register does not affect the value of the register where it is used as a data or program address in the current instruction.
M-917	Minor	When the debug tabs in xIDE become full and start discarding old content, the scroll bars are automatically set to the top. This makes it difficult to see the most recent output.
M-959	Minor	Pressing [F4] in xIDE does not take you to the next error after building a DSP project.
M-974	Major	Removing a project from a workspace while debugging crashes xIDE
M-975	Major	Two KalimbaLoads in quick succession causes BlueLab debugger to stop working. Setting a VM breakpoint on the second KalimbaLoad will stop the problem occurring.
M-995	Minor	xIDE is unable to debug applications with the Panic Action project property set to Panic entire chip if they panic shortly after the chip boots. It gives the error Failed to send or process command.
M-1001	Fatal	xIDE crashes while attempting to decode the DM_HCI_WRITE_STORED_LINK_KEY primitive sent by the application.
M-1004	Minor	If the size of a Kalimba variable is changed and the application rebuild then re-run whilst watching the variable in xIDE, the window becomes stale, showing the correct size but the wrong number of elements. Removing the variable and restoring it to the window overcomes this problem.
M-1006	Medium	When debugging DSP code on BlueCore5-Multimedia, xIDE will issue warnings when it needs more than the four supported hardware breakpoints, but then runs the DSP application anyway rather than aborting.
M-1071	Minor	The BlueStack tab in xIDE does not fully decode all primitives. Some, including RFC_EX_ESTABLISH_IND and DM_SYNC_CONNECT_CFM, are reported in raw form.

Table A.2: Known Issues (xIDE)

The following items correspond to features which were present in BlueLab2 but are not available in BlueLab v3.6.

ID	Severity	Description
B-3575	Minor	DacGetBlock/Level and AdcSetBlock/Level are missing from BlueLab3.

**Table A.3: Missing Features**

Table A.4 summaries the known issues associated with the BlueSuite tools shipped with BlueLab v3.6. See the *BlueSuite v1.23 Software Release Note* for know workarounds to these issues.

ID	Severity	Description
B-401	Medium	PSTool lacks the means to manipulate PS keys directly in flash, without having to send messages to the firmware.
B-704	Low	The buttons in PSTool advertise keyboard shortcuts (i.e, one of the letters is underlined) but these do not work correctly.
B-841	Medium	At present, Boot mode support within PSTool is handled by Edit Raw.
B-2558	Low	Currently, Broadcast mode will transmit image contents greater than 4Mb even if all the devices have 4Mb flash. This causes problems with Hoisted images, since the contents are amenable to truncation, but partially filled sectors cause errors.
B-2971	Low	If a PS Key (that exists on a connected device) is clicked on, the editable field for that key appears. If the user then chooses to reconnect to another device where the same key does not exist the <b>Entry not present</b> button appears without removing the editable field. However, the unwanted editable field is higher in the Z order making it difficult to press the button to add the entry.
B-3799	Low	The BlueFlash message indicating an image is too big is often generated erroneously.
B-4226	Low	.psr files dumped from PSTool or PSCli have information about how each key is stored which is lost when merged with PSTool or PSCli.
B-4319	Low	The firmware version is truncated when displayed in PSTool
B-5504	Medium	BlueFlash offers to erase VM applications, but erases the 32Kw legacy sector rather than the filesystem which is where BlueLab3 applications are stored.
B-6171	Major	The RAM test within BlueFlash occasionally gives a false negative.
B-11645	Minor	OR and AND operators are not supported in .psr files.
B-12733	Low	The TX PA atten setting for BlueCore5 is missing from the PSTool entry for PSKEY_LC_ENHANCED_POWER_TABLE key.
B-14911	Low	In PSTool if connected to a device over USB, clicking <b>Reconnect</b> does not allow selection of the same device.

**Table A.4: Known Issues in BlueSuite v1.23 Tools Shipped with BlueLab v3.6**



## Appendix B Issues Resolved in BlueLab v3.6

The following issues have been fixed in BlueLab v3.6.

ID	Severity	Description
B-4924	Minor	Support for S/PDIF input and output (audio only) has been added to the firmware. This is typically accessed using <code>PcmRateAndRoute()</code> from the VM. <b>Note:</b> Not all versions of BlueCore support S/PDIF.
B-5662	Minor	It is now possible to run two instances of gcc at once. For example, building from two instances of xIDE at the same time.
B-5951	Minor	The xIDE Project Properties dialogue box now allows the specification of a custom firmware path.
B-8026	Minor	It is now possible to add custom capabilities to a stream endpoint using the function <code>A2dpAddSep()</code> . The custom capabilities passed into the function are now copied directly into the internal message sent by the library.
B-8979	Minor	Occasionally an AVRCP connection attempt from one device to another would fail when running multiple iterations of connects then disconnects. This has been fixed.
B-9727	Major	DFUWizard is included in the BlueLab v3.6 release.
B-10807	Minor	The VM no longer panics under heavy message load when running under the debugger. Messages are dropped and <i>messages lost</i> is shown in the messages tab.
B-11377	Minor	The <code>stereo_headset</code> application now sends an AVRCP Pause when it suspends the A2DP source due to SCO interruption, and sends an AVRCP Play when the source is started again.
B-11597	Minor	To allow <b>FFWD/REW</b> to continue while a button is held down, AVRCP now resends <b>FFWD/REW</b> every second until the button is released.
B-11662	Minor	The BlueStack tab in xIDE now displays the <code>iac_lap</code> field of the <code>DM_HCI_WRITE_CURRENT_IAC</code> primitive correctly.
B-11781	Major	The <code>stereo_headset</code> application now passes interoperability tests with the Nokia 8800.
B-12015	Medium	After sending AVRCP <i>stop</i> the <code>stereo_headset</code> application now sends AVRCP <i>play next</i> and not a <i>pause</i> when the <b>play/pause</b> button is next pressed,. This ensures it does not take two presses of the <b>play/pause</b> button to resume play.
B-12083	Minor	<code>Piolib</code> is now able to coexist with files generated by <code>buttonparse</code> .
B-12261	Minor	The <code>stereo_headset</code> application now sends <code>A2DP_Suspend</code> when the pause key is pressed and no AVRCP connection exists..
B-12832	Minor	Two new traps, <code>MessageChargerTask</code> and <code>ChargerDebounce</code> , have been added for BlueCore variants with the required hardware. <code>MessageChargerTask</code> allows the application to register a task to receive charger messages. <code>ChargerDebounce</code> allows the application to register interest in charger events. Events will result in <code>MESSAGE_CHARGER_CHANGED</code> messages being delivered to the task registered with <code>MessageChargerTask</code> .
B-12859	Minor	If <code>dfubuild</code> is given a <code>.psr</code> file that contains duplicated keys, it now reports the problem with a message that clearly informs this is the case.
B-12917	Major	A2DP streaming is now always restarted after the stereo headset has connected to an AG.
B-13179	Minor	When initiating a connection the <code>gavdp</code> library now correctly sets the local MTU to the L2CAP default.
B-13358	Minor	A complete flash erase of a BlueCore3-Multimedia chip using BlueFlash only erased the first half of flash. This has been corrected so the flash is fully erased.
B-13591	Major	Significant performance improvements have been made to <code>kalasm2</code> .

ID	Severity	Description
B-14263	Minor	The <code>stereo_headset</code> application now plays a min/max beep when the volume is changed from AG and the volume reaches its limits.
B-14270	Major	Previously, writing to memory at location zero did not work. That is, code such as the following assembled incorrectly: <pre> M[0] = R0; // Assembled as M[R0] = NULL + NULL; M[0] = R0 + R1; // Assembled as M[R0] = R1 + NULL; </pre> This has now been fixed.
B-14369	Minor	The <code>a2dp_source_dongle</code> now checks for mono audio configuration when using analogue audio inputs.
B-14478	Minor	Application project files have been reviewed and updated for consistency.
B-14578	Minor	As the number of BlueCore chips with Kalimba DSPs increases the number of variations in the code has increased. To reflect this code references family level defines and chip specific defines e.g. <code>BlueCore5</code> and <code>BlueCore5-Multimedia</code> have been added to the DSP makefiles..
B-14595	Minor	Each variant of the Kalimba DSP is now described by a family level define (to determine available instructions, etc.) and chip define (to determine RAM sizes, etc.). The DSP applications and library code have been updated to use these defines.
B-14670	Minor	<code>Kalprofiler</code> could get caught in an infinite loop trying to process the linked list of profile structures. This has been fixed.
B-14720	Minor	Some profiler structures in the timer routines in the core DSP library were not initialised correctly. They are now initialised correctly.
B-14845	Minor	The DC remove, mix and sidetone mix operators used the wrong parameter offset for their reset functions. This has been fixed.
B-15126	Minor	The file formats for object files, libraries and debug symbols have been changed to reduce disk usage, improve compile and link times, and reduce startup time for the debugger.
B-15160	Major	The <code>stereo_headset</code> application connects to a phone using the handsfree or headset profile after the headset has been powered on. It no longer attempts to connect the AVDTP signalling channel at this point.
B-15197	Minor	When debugging a BlueLab application, xIDE now attempts to report a reason for any panics that occur.
B-15235	Minor	A new trapset, HID2 has been added to initialise Avago 5030, 6030 and 7050 mouse sensors.
B-15251	Minor	The PS key routines in the core DSP library referenced a non-existent field when cancelling the re-attempt timer, applications which subsequently used these routines failed to build. This is fixed.
B-15316	Major	There was a memory corruption bug in <code>warp_and_shift</code> operator when its reset function was called due to incorrect use of length registers. This is fixed.
B-15348	Major	The <code>stereo_headset</code> application now resets its internal state correctly if the AVRCP connection is dropped before a response to a command is received.
B-15531	Minor	If voice dial fails, the <code>stereo_headset</code> application now restarts AV streaming.
B-15655	Major	On BlueCore5-Multimedia the SBC decoder could incorrectly reconstruct a sub-band sample if that sub-band was using all 16 bits. The fault occurred because of a fix in the LSHIFT instruction on BlueCore5-Multimedia vs BlueCore3-Multimedia. The <code>sample_reconstruction</code> function has been adjusted so that the fault (crackles) does not occur.
B-15729	Minor	The functionality in the core DSP library to send messages has been more cleanly split into long and short, send and receive, to make it easier for custom libraries to be built, for example without code to send long messages but with the ability to receive them.
B-15741	Minor	An example application for a PBAP server has been added. This application uses the read-only filesystem to store the phonebook data.

ID	Severity	Description
B-15767	Minor	The profile routines have been added to the non-debug variant of the core DSP library as well as the debug variant. This allows debug builds of applications and other libraries without having to use the debug version of the core library.
B-15857	Minor	The Kalimba Matlab tool <code>kalstacktrace</code> attempts to open source code files if it finds the DSP in the error routine. If it fails to open the file it no longer attempts to close the file causing an error.
B-15875	Minor	The <code>FTPC_PULL_OBJECT_START_IND</code> message structure declares the <code>objectSize</code> of a <code>uint16</code> . GOEP passes this value to FTPC as a <code>uint32</code> . It is now correctly passed on as a <code>uint32</code> .
B-15884	Major	An initial version of a new <code>audio</code> library has been created. This provides an abstraction layer for underlying audio components. At present it is an immature implementation and is largely for internal development.
B-15911	Minor	Standard messages defined in <code>kalimba_standard_messages.h</code> sent between libraries in the VM and DSP have been reviewed. All messages now follow the standard naming convention.
B-15947	Minor	The <code>goep</code> library now correctly rejects connection requests from the client if it already has an active connection.
B-15977	Minor	xIDE no longer shows a Python error in the command window on startup.
B-16080	Minor	The encoder in the CODEC library is either streaming or stopped. These states were referenced as either 0 or 1. The constants <code>\$codec.stream_encode.STATE_STOPPED</code> and <code>\$codec.stream_encode.STATE_STREAMING</code> are now used.
B-16087	Minor	The Kalimba Matlab tool <code>Kalports</code> now reports the configuration of the port and the amount of data/space available, as well as its status.
B-16121	Minor	In IrDA OBEX GET (and GOEP GET), the final bit indicates the final packet containing headers. Since GOEP only send headers in the first packet, it always sends GET Complete (0x83).
B-16145	Major	Support for internal battery monitoring when using BlueCore5-Multimedia on the DEV-1645 board has been added.
B-16217	Minor	An example PBAP client application has been added.
B-16218	Minor	A Windows GUI to drive the PBAP client VM application has been added.
B-16219	Minor	The debug check in <code>PbapcPullvCardListingStart</code> was checking for less than when the check should have be for less than or equal to. This caused a valid mode of operation (download current folder) to fail in debug. This has been fixed.
B-16224	Minor	The define used by the Phonebook Access Client Library for <code>ListStart</code> application parameter ID (5) was being used as the default value instead of the correct default (0). This has been corrected.
B-16240	Minor	Between the prototype and released specification, the vCard handle format was changed from decimal to hexadecimal. The <code>pbap</code> libraries now use the correct format.
B-16254	Medium	The Kalimba Matlab tools have been updated to support BlueCore5-AMAP and BlueCore5-DSPROM.
B-16324	Major	The Kalimba <code>dtmf</code> library did not function correctly. Various corrections and enhancements have been made and this library now functions correctly.
B-16490	Major	The <code>stereo_headset</code> application now correctly sends a button press whenever the <code> fwd </code> or <code> back </code> buttons are released.
B-16634	Minor	The <code>a2dp</code> library function <code>A2dpEnableSignallingIndications</code> has been added. When called the application receives a message when a signalling channel has been opened or closed.

ID	Severity	Description
B-16672	Minor	<p>BlueCore5-Multimedia can make UART and PCM pins appear as PIOs 16..23. The traps have been added to support this new functionality:</p> <ul style="list-style-type: none"> <li>▪ PioGet32</li> <li>▪ PioSet32</li> <li>▪ PioGetDir3</li> <li>▪ PioSetDir32</li> <li>▪ PioGetStrongBias32</li> <li>▪ PioSetStrongBias32</li> <li>▪ PioSetMapPins</li> <li>▪ PioGetMapPins</li> <li>▪ PioSetKalimba32</li> <li>▪ PioGetKalimba32</li> </ul>
B-16681	Minor	In the GOEP specification a server that wishes to make an authentication challenge during connection should respond with <i>unauthorised</i> (0x41). But some implementations respond with <i>unauthorised and the final bit is set</i> (0xc1). A check for <i>unauthorised and final bit set</i> (0xc1) has been added.
B-16721	Major	Support for HFP 1.5 has been added to the <code>stereo_headset</code> application.
B-17030	Minor	A Slice transform to remove a configurable number of bytes from the start and end of each packet has been added.
B-17031	Major	The pairing mode timer in the <code>stereo_headset</code> application is now correctly cancelled when the application powers down.
B-17140	Minor	It is now possible for the user to defined their own character classes in the <code>.parse</code> file, for use in patterns in place of the pre-defined parameters <code>%s</code> , <code>%d</code> and <code>%*</code> . See a <i>guide to BlueLab Command Line Tools</i> section 6.
B-17144	Minor	The <code>VmChecksum</code> function has been added to perform simple checksums on flash regions.
B-17167	Minor	A new message, <code>MESSAGE_PSFL_FAULT</code> has been added. This message is sent to the registered system task if flash corruption is spotted in the Persistent Store.
B-17200	Major	A new routine has been added to the <code>cbuffer</code> routines in the core library: <code>\$cbuffer.force_mmu_set</code> . This is for use with BlueCore5 family of chips and forces an MMU buffer set.
B-17265	Minor	When receiving long messages from Kalimba, they now have the id <code>LONG_MESSAGE_FROM_KALIMBA</code> rather than the id <code>MESSAGE_FROM_KALIMBA</code> .
B-17378	Minor	The <code>stereo_headset</code> application now correctly continues charging even when the application is powered down.
B-17576	Major	The <code>stereo_headset</code> application has been updated to work better on a DEV-1442 development board. <b>Note:</b> Battery monitoring is not supported on these boards.
B-17583	Minor	Compact firmware builds from BlueLab v3.6 and Firmware v22.x onwards include the raw UART transport.
B-17691	Major	When sending a CIND response the <code>aghfp</code> library now correctly inserts a comma between the <code>callsetup</code> and <code>callheld</code> indicators. This only affects AG implementations enabling the HFP 1.5 features.

ID	Severity	Description
B-17934	Major	\$cbops.scale_16_bit would not build for BlueCore5-Multimedia because it tried to call a function that didn't exist. This has been resolved and the comments updated.
B-17965	Major	Buttonparse now copes with 32 PIO lines and charger events. See a <i>guide to BlueLab Command Line Tools</i> section 4.
B-17989	Minor	The parser produced by genparse.exe now copes with AGs sending AT commands containing extra characters, \r\n, before the expected sequence.
B-18089	Minor	The messaging system used to send long messages between Kalimba and the VM/Firmware uses several buffers. These buffers were all define independently of each other and were various sizes. They have all now be standardised to allow messages with maximum payload sizes of \$message.MAX_LONG_MESSAGE_TX_PAYLOAD_SIZE and \$message.MAX_LONG_MESSAGE_RX_PAYLOAD_SIZE.
B-18147	Major	The stereo_headset application now correctly enables voice dial even if the HFP audio gateway and AV source are the same device.
B-18197	Minor	Support has been added to the core DSP library to allow the DSP to obtain the flash address of a file in the file-system. A function has been provided that takes a VM file (index) handle and returns the start of the absolute address in flash.
B-18329	Minor	The stereo_headset application now only connects to the last used AV source on power on instead of attempting to connect whenever an HFP connection is created.
B-18442	Minor	Applications can now check if a timer handler is in use by checking the ID field, if it is non-zero the handler is in use.
B-18487	Major	The stereo_headset application has been updated to use the new audio library.
B-18549	Minor	PioSetRts now allows the RTS pin to be controlled when the USB interface is active. Previously it was only available if the UART was disabled or under VM control.
B-18563	Major	Applications have been update to expect LONG_MESSAGE_FROM_KALIMBA where appropriate. (see B-17265 in <b>Error! Reference source not found.</b> )
B-18606	Major	Reading VM_ADC_SRC_VDD_BAT returned incorrect readings in early firmware for BlueCore5-Multimedia. This has now been remedied.
B-18628	Major	The sco_dsp example application has had its .psr filename changed to match the VM application filename.
B-18682	Minor	The stereo_headset application has been updated to use version 2.7.6 of cVc.
B-18697	Minor	PioSetDir32, PioSetStrongBias32, PioSet32, PioSetMapPins, PioSetKalimba32, PioSetDirKalimba32 and PioDebounce32 now all return a 32 bit value where each bit represents a PIO. Previously, if the trap returned a high value for any bit then the trap could not configure that PIO in the way requested.
B-18723	Major	The application task registered using MessageSystemTask now receives MESSAGE_USB_DECONFIGURED as well as MESSAGE_USB_ENUMERATED. The application can then respond by limiting power consumption as required for USB qualification.
B-18733	Minor	The GoepConnectResponse function returned an error to the client if OBEX level authentication was being used. This has been corrected.
B-18943	Minor	ChargerDebounce now returns a 16 bit value where any bit set high indicates that bit was passed to ChargerDebounce as an event_to_enable but is an invalid event. ChargerDebounce will return zero on success and non zero on failure.
B-18967	Major	Requesting PS keys or the address of a file in the flash system from within a PS key/file address handler could previously cause the relevant message search routine to lock up. This has been fixed.

ID	Severity	Description
B-19181	Minor	PSR files have been added to the <code>pbap_client</code> and <code>pbap_server</code> applications to ensure that both devices have the same fixed pin for pairing.
B-19622	Minor	On BlueCore4-Audio and BlueCore5-Multimedia, reading any ADC source other than <code>VM_ADC_SRC_VDD_BAT</code> resulted in a <code>MessageAdcResult</code> with an incorrect <code>scaled_reading</code> field being returned. This has now been remedied and the <code>scaled_reading</code> field is now correct for all ADC sources and BlueCore chips. <b>Note:</b> The <code>scaled_reading</code> and <code>reading</code> fields are identical for all ADC sources other than <code>VM_ADC_SRC_VDD_BAT</code> .
M-455	Minor	The time taken for xIDE to load debug information for large projects has been improved.
M-475	Minor	xIDE previously tracked breakpoints by source line, which meant inserting lines in front of a breakpoint. This could cause it to move without warning. It now moves the breakpoint with the source line.
M-744	Minor	It is no longer possible for xIDE to open the same document twice.
M-761	Medium	The Kalimba register window groups the registers by type, these groups can be expanded and collapsed by the user. xIDE now remember which groups are open when switching between debug and edit mode.
M-905	Minor	xIDE no longer crashes if the user attempts to access the Debug menu with a workspace containing no projects.
M-940	Major	When using VM and DSP projects in a single xIDE workspace, all the DSP project that the VM application can load had to be included in the workspace. If while debugging such a workspace, the VM loaded a DSP project that was not included in the workspace, xIDE would stop debugging. This has been fixed.
M-956	Major	DSP project debug transport settings now mirror those of any VM project in the same workspace. This makes it possible to use the USBSPI adaptor by changing only one debug transport setting.
M-969	Minor	If pointers to structures are passed to a function as the first or second parameter, structure elements after the first one did not always display the correct value in the debugger. This has been fixed.
M-976	Minor	xIDE sometimes failed to program the DSP. This has been fixed.

**Table B.1: Issues Resolved in BlueLab v3.6**

Table G.2 summaries the issues addressed in the BlueSuite tools shipped with BlueLab v3.6. See the *BlueSuite v1.23 Software Release Note* for full descriptions.

ID	Severity	Description
B-6757	Minor	If an <code>.xpv/</code> <code>.xdv</code> file is changed after loading it into BlueFlash this is now picked up and used by the application.
B-7964	Minor	Several minor problems with the USB device driver were addressed.
B-12859	Minor	If <code>dfubuild</code> was given a <code>.psr</code> file with duplicate keys it reported <i>.psr is unreadable</i> it now more helpfully reports <i>.psr contains duplicated keys</i>
B-13358	Minor	If <code>dfubuild</code> was given a <code>.psr</code> file with duplicate keys it reported a <code>keys.psr</code> is unreadable it now reports <i>.psr contains duplicated keys</i>
B-13723	Minor	BlueFlash has been updated so it can handle flash parts greater than 32Mbit.
B-13984	Minor	On-chip flash burn speed has been improved in BlueFlash.
B-14580	Minor	DFU speed has been improved.
B-14641	Minor	BlueFlash now calculates CRCs for large flash parts more quickly.
B-14661	Minor	<code>dfuengine.dll</code> no longer has dependencies on Microsoft debug dlls.

ID	Severity	Description
B-15037	Minor	BlueFlash and BlueFlashCmd now default to the same crystal speed.
B-15168	Minor	BlueFlash now has a longer erase timeout allowing the operation to complete on all chip variants.
B-16021	Minor	PSTool's edit raw function limited the PS Key to 0xFFF, this has been update to 0xFFFF.

**Table B.2: Summary of BlueSuite v1.23 Resolved Issues**

## Appendix C Issues Resolved in BlueLab v3.5

The following issues have been fixed in BlueLab v3.5.

ID	Severity	Description
B-5174	Minor	If variables were initialised with values which had to be calculated by the preprocessor, certain combinations using divide caused kalasm2 to return an error. This has been corrected.
B-6527	Minor	kalasm2 now allows the use of expressions when specifying the size of an array, provided that the expression evaluates to a constant. For instance, the following now works: <pre>.CONST N 10; // Declare array of size 20 .VAR my_var[N*2];</pre>
B-6712	Major	A panic in the hid Library has been fixed. This panic was caused by the HID instance being destroyed too early if the application chose to reject an incoming HID connection.
B-6841	Minor	If the UART is being used for user data then BlueCore does not restart the timer for PS Key <code>UART_SLEEP_TIMEOUT</code> when it receives data on the UART while awake. It uses activity to wake up from deep sleep, but it does not register any activity while the chip is awake.  Since BlueCore should be told by the VM when it's safe to enter deep sleep, this is unlikely to affect VM applications, but users should be aware of this behaviour. CSR may provide the facility for the user transport to behave as the BCSP one does in this regard at a later date.
B-6902	Major	A coding error within the Bluecore firmware led to excessive consumption of internal resources in complex scatternet scenarios - the most common example being a device with 6 slaves to which a remote device attempts to connect. It was possible for the Bluecore device to become unresponsive. This has been resolved.
B-7487	Minor	Firmware for 6Mbit parts which does not support DFU now has an additional 32kW available for the contents of the filesystem due to a redesign of how the filesystem is laid out.
B-7554	Major	When using any of the H4, H4DS, or user transports with very large HCI ACL packet sizes or when the system is very heavily loaded, it was possible for the from-host data path to stall. This has now been fixed.
B-7733	Minor	PS Key <code>INITIAL_PIO_STATE</code> is a useful PS Key to configure the PIO lines prior to booting. This PS Key, which is often used to keep power hold signals active when booting, was previously not being applied in DFU mode. This was preventing some DFUs from working. This issue has now been resolved.
B-7837	Major	The following support for BlueCore5-Multimedia has been added: <ol style="list-style-type: none"><li>1. Altered and increased memory map.</li><li>2. Changes made to library code to support DSP peripheral changes.</li><li>3. Makefile updated to build BlueCore5-Multimedia versions of libraries.</li></ol>
B-7903	Minor	When using BCSP as the transport for PSTool and selecting a COM port which does not exist (or is already in use), PSTool no longer causes an internal error in the C++ runtime library.
B-9586	Minor	The <code>hfp</code> library now produces AT+VGM using the same parameter formatting as AT+VGS i.e. numeric values are always 2 digits long. This causes values less than 10 to be presented with a leading zero. These commands are formatted correctly, as specified by V.250 "Serial asynchronous automatic dialling and control".
B-10032	Minor	kalasm2 now supports the Borrow (B) and Not Borrow (NB) flags. These are the inverse of the carry flags. For instance, B is equivalent to NC (Not Carry), and NB is equivalent to C (Carry).



ID	Severity	Description
B-10748	Minor	BlueFlashCmd now indicates it is waiting for a mutex if it cannot immediately obtain the SPI application mutex.
B-10816	Minor	The connection library now handles DM_EN_ACL_OPENED_IND and DM_EN_ACL_CLOSED_IND messages if supported by the underlying firmware. Compatible firmware that does not support these new messages causes a VM panic in the connection library when running under xIDE. In such cases the application cannot be run under xIDE but still operates as expected without xIDE attached.
B-10825	Minor	Firmware changes have been made to improve the throughput of host streams (passed over BCSP channel 13.)
B-11148	Major	The Call Manager and Audio Handler parts of the aghfp library now cooperate with one another. This prevents confusion due to opening/closing an audio connection while a call is being setup/shutdown (or vice-versa).
B-11346	Minor	The BlueLab linker now outputs a map file.
B-11389	Minor	The aghfp library has been modified to allow eSCO/EDR packet types when creating/accepting a synchronous connection.
B-11391	Minor	The hfp library now supports eSCO packet types supported for HFP1.01 and HSP 1.0.
B-11400	Major	In kalasm2, when declaring array variables with initialisation data, it is necessary to separate the initialisation elements with a comma: <pre>.VAR \$myVar[] = 1, &amp;\$test, 3, 4;</pre> If a comma is missed and the next element is the address of a variable, kalasm2 treats the & as a bitwise and operator instead of the address of operator: <pre>.VAR \$myVar[] = 1 &amp;\$test, 3, 4;</pre> Previously, this would result in the bitwise and being silently compiled, which is unlikely to be the intended result. kalasm2 now raises an error in this case.
B-11478	Major	Support for BlueCore5-Multimedia has been added to core kalimba libraries
B-11484	Minor	The trap SinkGetRssi has been added to retrieve the RSSI information on the corresponding ACL (if any.) This is equivalent to the BCCMD RSSI_ACL.
B-11585	Major	Support for BlueCore5-Multimedia has been added to BlueLab 3.5.
B-11644	Major	Changes have been made in mexspi.dll to address intermittent problems when accessing Kalimba from inside Matlab.
B-11715	Minor	The hfp library now issues only one AT+COPS=3,0 command, rather than each time AT+COPS? is sent.
B-11813	Minor	Keyboard applications now support sending of Pin Code input reports.
B-11818	Minor	The OPP Server library now supports the server aborting a transaction.
B-11827	Minor	A problem was identified in the Bluecore firmware when configured as a bus-powered USB device. During a USB suspend condition, Bluecore would only go into its low power mode (deep sleep) for the first 40 seconds of the suspend. It should have remained in deep sleep for the full duration of the suspend in order meet the USB power consumption requirements. This problem has now been remedied.
B-11859	Minor	AGHFP now uses the Handsfree's requested CLIP mode (via AT+CLIP) to determine whether to send +CLIP notifications during a call setup.
B-11906	Minor	Until now, when applying the PS Key INITIAL_PIO_STATE, the PIO direction was being set before the state rather than the other way round. This bug has now been resolved.
B-11937	Fatal	The code generated by buttonparse in BlueLab-3.4-release did not work on BlueCore2 and BlueCore3-Multimedia parts due to a bug when PS Key PIO_WAKEUP_STATE was not present. This has been remedied.
B-11945	Fatal	A rare problem has been addressed in the compiler which caused it to potentially generate incorrect code for accesses to arrays allocated on the stack in certain circumstances. This was found during internal testing and caused the VM to panic.

ID	Severity	Description
B-11967	Minor	A memory leak which occurred in the very rare situation of an ACL in sniff timing out whilst the DM was requesting to exit sniff before performing a roleswitch has been fixed.
B-11969	Cosmetic	The documentation for the sink header no longer mentions the non-existent <code>SinkClaimed</code> function.
B-11994	Cosmetic	The AV dongle application no longer includes the <code>service</code> and <code>region</code> libraries in the project properties as it does not use these libraries.
B-12003	Minor	EDR packet mask bits, used in primitives sent to the HCI, now correctly use inverted logic.
B-12018	Minor	<code>unpackfile</code> has been extended to understand dumped images and <code>merge.xpv</code> files as well as simple filesystem images.
B-12024	Minor	The <code>hfp</code> library now falls back to negotiating a SCO connection if a request for an eSCO link is ignored by a remote device. This corrects an interop issue where an AG reports that it can support eSCO at the baseband level but will not respond to eSCO connection requests causing a HCI Host Timeout error to be generated.
B-12076	Major	Call Manager now receives notification of any SCO negotiation failure if it is managing a call setup. Previously, a notification was sent directly to the app leaving the Call Manager in an incorrect state.
B-12077	Minor	The <code>aghfp</code> library now sends OK in response to ATA or AT+CHUP commands when managing a call via the Call Manager.
B-12083	Minor	A directive <code>use_piolib</code> has been added to allow <code>piolib.h</code> to be used with code generated by <code>buttonparse</code> .
B-12109	Major	The <code>hfp</code> library now correctly continues the SLC connection process if it receives out-of-spec SDP attribute data during an SLC connection.
B-12117	Major	B-6879 reduced the latency of data flowing into the DSP on 21.x and later firmware. This introduced a problem where the DSP could fail to be notified of data arriving on an RFCOMM connection. This has now been resolved.
B-12133	Minor	The <code>gavdp</code> library used to issue an ABORT request even if a CLOSE request was accepted by the remote device, it no longer does this.
B-12141	Minor	The Device Manager has been modified to ignore the EDR <code>packet_type</code> bits for a Synchronous Connection when running on a non-EDR chip. This allows the client to be agnostic to whether the chip supports EDR or not.
B-12206	Minor	The <code>hfp</code> library's parser file has been optimised to reduce the size of the generated code.
B-12256	Major	Fixed a firmware bug with Inquiry with RSSI which could cause the Page Scan Mode of the device cache to become corrupt.
B-12277	Minor	Functions have been added to <code>pio.h</code> to control the dedicated MIC BIAS pin on BlueCore5-Multimedia.
B-12305	Minor	<code>PioFlashLed0</code> and <code>PioFlashLed1</code> functions have been added to control new the dedicated LED hardware on BlueCore5-Multimedia.
B-12420	Minor	In the DSP matlab files <code>Kalreadval</code> can now read from program memory and <code>kalwriteval</code> can write to program memory.
B-12427	Major	<code>pscli</code> no longer crashes if an attempt is made to dump firmware from a chip with no firmware.
B-12433	Major	An issue when running with Bluestack on-chip where it was possible for L2CAP Connectionless data to corrupt the baseband's buffers and cause it to continuously transmit zero-length broadcast packets, has been fixed.

ID	Severity	Description
B-12478	Minor	The <code>spp</code> library no longer sends <code>MESSAGE_MORE_DATA</code> and <code>MESSAGE_MORE_SPACE</code> messages. It now sends <code>SPP_MESSAGE_MORE_DATA</code> and <code>SPP_MESSAGE_MORE_SPACE</code> instead. These new messages have structures <code>SPP_MESSAGE_MORE_DATA_T</code> and <code>SPP_MESSAGE_MORE_SPACE_T</code> , which contain an additional field <code>SPP *spp;</code> pointing to the associated SPP instance.
B-12479	Minor	The <code>dun</code> library now handles the <code>MESSAGE_MORE_SPACE</code> message. It also creates DUN equivalents of <code>MESSAGE_MORE_DATA</code> and <code>MESSAGE_MORE_SPACE</code> ( <code>DUN_MESSAGE_MORE_xxxx</code> ). New SPP messages ( <code>SPP_MESSAGE_MORE_xxx</code> ) are also handled.
B-12483	Minor	The BlueLab linker, <code>ld</code> , no longer crashes when run with no arguments.
B-12533	Minor	The DSP code has been reordered to avoid stalls when running on BlueCore5-Multimedia.
B-12549	Minor	BlueLab can now use CSR's USB->SPI converter (Babel) as an SPI connection, instead of a direct connection to LPT1.
B-12613	Minor	The DSP libraries and pre-built applications are now placed in <code>bc3mm</code> or <code>bc5mm</code> subdirectories as appropriate.
B-12620	Major	The <code>hfp</code> library will now supply default parameters that will allow an incoming synchronous connection request with S3 settings to be negotiated.
B-12646	Minor	The <code>PioSetAudioLDORegulator</code> and <code>PioSetBtLDORegulator</code> functions have been added to control the linear regulators on BlueCore5-Multimedia.
B-12648	Minor	Two new routines have been added to the DSP timer library, <code>\$timer.n_ms_delay</code> and <code>\$timer.n_us_delay</code> , which implement an <code>n</code> millisecond and <code>n</code> microsecond delay respectively. They both use slower clock rates to improve current consumption.
B-12664	Minor	A scale operator has been added to the <code>cbops</code> library. This allows combinations of integer and fractional multiplies.
B-12752	Minor	A <code>_print</code> variant of <code>pio.h</code> library has been added which prints debug output.
B-12753	Minor	A VARIANTS file has been added to produce a version of the <code>dun</code> library which will display debug output ( <code>dun_print</code> ).
B-12754	Minor	A VARIANTS file has been added to the <code>goep</code> library to produce versions which will display debug output ( <code>goep_print</code> ) and packet decode ( <code>goep_print_decode</code> ).
B-12755	Minor	A VARIANTS file has been added to the <code>pbaps</code> library to produce versions which will perform debug checks ( <code>pbaps_debug</code> ) and to display debug output ( <code>goep_debug_print</code> ).
B-12756	Minor	VARIANTS file have been extended to produce libraries which will display debug output ( <code>ftps_debug_print</code> , <code>ftpc_debug_print</code> , <code>oppc_debug_print</code> , <code>opps_debug_print</code> ).
B-12779	Major	GCC failed to generate code for uninitialised static const globals, causing linker errors. The problem is now resolved.
B-12787	Minor	To prevent a panic in debug mode on a stream disconnect, <code>MESSAGE_STREAM_DISCONNECT</code> is ignored. <code>MESSAGE_SOURCE_EMPTY</code> is also ignored on RFCOMM disconnect to prevent a panic.
B-12796	Minor	The default set of code segments has been expanded to include a segment in Data memory 1 which will be linked first, i.e. it will always start at address <code>0x0000</code> . This is for use in <code>cVc</code> applications but may be useful in others.
B-12803	Minor	The stream subsystem now uses the value of PS Key <code>PCM_CONFIG32</code> , making it possible to support external 8bit CODECs. (Previously it assumed all external CODECs were 16bit.)

ID	Severity	Description
B-12820	Minor	DSP projects in xIDE now have a property which controls whether the DSP application is loaded fully by the Xap, or use a small DSP bootstrap which loads the rest of the application more quickly. (This is ignored for BlueCore3-Multimedia where it is not supported.)
B-12903	Major	<code>ConnectionSmSetSdpSecurityIn</code> and <code>ConnectionSmSetSdpSecurityOut</code> previously could be delayed in an internal message queue. It was possible for functions called later to execute first. This has now been remedied.
B-12913	Major	An issue has been resolved where the <code>max_frame_size</code> field of an <code>RFC_START_CFM</code> would contain the locally requested value and not the negotiated value.
B-12939	Minor	The <code>battery</code> library now uses scaled values provided by the firmware for the internal battery monitor. This allows it to cope with chip differences between BlueCore4-Audio and BlueCore5-Multimedia parts.
B-12977	Minor	BlueCore5-Multimedia can make UART and PCM pins appear as PIOs 16 to 23. The traps <code>PioGet32</code> , <code>PioSet32</code> , <code>PioGetDir32</code> , <code>PioSetDir32</code> , <code>PioGetStrongBias32</code> , <code>PioSetStrongBias32</code> , <code>PioSetMapPins</code> , <code>PioGetMapPins</code> , <code>PioSetKalimba32</code> and <code>PioGetKalimba32</code> have been added to support this new functionality.
B-13038	Major	Routing of 8bit data through transparent SCO using the stream subsystem produced corrupted output since parts of the data path were incorrectly configured for 16bit data. This has been fixed.
B-13178	Minor	BlueCore5-Multimedia now supports an 8bit mode in reading/writing to MMU ports. Also automatic saturation to 8/16bits is supported. The <code>cbuffer</code> libraries have been updated to support this.
B-13189	Minor	The DSP on BlueCore5-Multimedia cannot write into the second memory region shared with Xap (used for MMU handles.) It never needed to, and this removes one mechanism for an errant DSP application to cause problems for the rest of BlueCore.
B-13232	Minor	On BlueCore3-Multimedia (later chips already have this feature supported in the firmware), the PIO lines used to wake the chip from deep sleep can now be active low. This is controlled by PS Key <code>PIO_WAKEUP_STATE</code> .
B-13290	Major	An issue that caused a firmware panic to occurred when using VM SCO Streams and a SCO link was opened and closed within a few tens of milliseconds, has been fixed.
B-13338	Minor	Previously you could only register a handler against a particular message ID. In the DSP libraries if you wanted to receive IDs <code>0x10</code> & <code>0x11</code> , you had to register two handlers. Now you can register to receive an ID and a mask field, so in this example you register ID <code>0x10</code> mask <code>0x1</code> .
B-13374	Major	An SDS issue has been fixed which meant that searching for non-Bluetooth 128bit UUIDs could return incorrect results. This bug was caused by SDS assuming that all 128bit UUIDs were using the Bluetooth Base UUID and hence only comparing the lower 32bits which could result in an incorrect match or a no match if the bottom 32bits were zero.
B-13406	Major	BlueCore5-Multimedia can enable a low power mode for the output stage of each CODEC channel. Enabling the low power modes will reduce power consumption at the cost of a slight reduction in audio quality. The traps <code>CodecOutputStageAEnableLowPower</code> and <code>CodecOutputStageBEnableLowPower</code> have been added to support this new functionality.
B-13481	Major	SBC headers include a 1 byte check sum to detect if the frame is corrupted. However it is possible for the frame to be corrupt and the check sum to pass. Consequently further sanity checks have been added to certain parameters read from the header.
B-13506	Major	If a source was manipulated directly by the application (using, say, <code>SourceDrop</code> ) before being connected to the DSP it was possible for the DSP to see an incorrect figure for the amount of data present in the source. This has been fixed.

ID	Severity	Description
B-13511	Minor	A field ( <code>sco_handle</code> ) has been added to the <code>CL_DM_SYNC_CONNECT_CFM_T</code> to enable the LM SCO handle to be forwarded to the application or library.
B-13529	Minor	<p>21 and prior firmware contained hard-coded limits on the shallow sleep power-saving mode when a PCM interface or internal codec was in use. PS Key <code>PCM_MIN_CPU_CLOCK</code> provided a way for the user to further limit shallow sleep.</p> <p>These limits have now been removed. This may allow more power to be saved, but it is also now possible to configure the system such that the PCM/CODEC do not function correctly. The shallow sleep limit PS Keys should only be reduced on advice from CSR.</p> <p>A new PS Key <code>CODEC_MIN_CPU_CLOCK</code> has been provided to give separate control over shallow sleep when a PCM interface and an internal CODEC is in use. (Previously, PS Key <code>PCM_MIN_CPU_CLOCK</code> applied to both.)</p>
B-13535	Minor	<p>Previously, <code>kalasm2</code> would not expand a macro if it was preceded by a <code>\$</code> (which marks global scope in a variable). So the following would not work:</p> <pre>.VAR \$bar = 5; .define FOO bar .VAR \$foo = \$FOO;</pre> <p>Support for expanding macros such as <code>FOO</code> when they have a <code>\$</code> in front of them has now been added. In the above example, <code>\$foo</code> would take on the value of <code>\$bar</code>.</p>
B-13577	Minor	The <code>vm.h</code> online documentation now includes a description of the <code>VmTransmitEnable</code> function.
B-13611	Minor	The <code>aghfp</code> library explicitly ignores the <code>CL_SM_ENCRYPTION_CHANGE_IND</code> message from the connection library.
B-13635	Minor	I2S can only be used on PCM ports 0 and 1. <code>PcmRateAndRoute</code> will now return <code>FALSE</code> on attempts to route I2S to any other port.
B-13696	Major	<p>A more detailed configuration of the Digital Audio Interface has been added, typically used for outputting I2S.</p> <p>These settings are controlled via PS Key <code>DIGITAL_AUDIO_CONFIG</code>, PS Key <code>DIGITAL_AUDIO_RATE</code> and PS Key <code>DIGITAL_AUDIO_BITS_PER_SAMPLE</code>.</p>
B-13704	Major	An issue has been fixed in the SDP server which meant that records containing 128bit UUIDs were not parsed correctly and could result in a search incorrectly returning <code>PDU_SYNTAX_ERROR</code> .
B-13769	Minor	The debug version of the DSP SCO processing library did not build correctly. The internal define <code>SCO_DEBUG_ON</code> was never defined. This has been corrected.
B-13833	Minor	When a DSP timer is set it is allocated an ID, which could be zero. If a timer was cancelled that had never been used the ID would be zero which could have been a real timer. The DSP libraries have been modified so that zero is never an assigned timer.
B-13984	Minor	On-chip flash burn speed has been improved.
B-14020	Minor	The user friendly names of PS Keys <code>USRx</code> have been slightly altered so that they sort more nicely in PS Tool's list box.
B-14024	Minor	The BlueLab installer now adds copies of the relevant transport DLLs ( <code>spilpt</code> , <code>pttransport</code> ) alongside the <code>mexspi</code> DLL which is the basis of the DSP matlab tools.
B-14043	Major	Fixed an audio corruption issue when routing multiple SCO links to the external PCM port and using an 8bit codec. When one of the SCO links was disconnected, the format would default back to 16bit and hence cause audio on the remaining SCO links to become corrupted.
B-14122	Minor	The stereo headset application supplied now includes version 2.76 of <code>cVc</code> and an update version of the <code>ParamMgr</code> tool.

ID	Severity	Description
B-14173	Minor	A new function has been added to the DSP message library to return the amount of space in the message queue.
B-14213	Minor	A project property has been added which allows the <code>stereo_headset</code> application to run on DEV-PC-1442 board.
B-14271	Minor	A set of PS Key retrieval routines have been added to the core DSP library. Now users simply request a key to be retrieved and the relevant handler is called when ready. Multiple keys can be requested without having to wait for the previous requests to complete.
B-14337	Minor	It was possible for the chip version stored in <code>kalprocessor</code> , in the DSP matlab tools, to become stale very easily. As you need to reload the symbols when you change chips <code>kalloadsym</code> now forces <code>kalprocessor</code> to read the chip version.
B-14365	Minor	A new tool - <code>kalports</code> - has been added to the Matlab tools which allows users to determine the state of Kalimba's MMU ports - connected or disconnected.
B-14389	Minor	The BlueCore variant, storage size and storage type can now be specified from xIDE->Project->Properties. These settings will override the automatic detection that usually takes place
B-14479	Minor	The default configuration files for the mono headset have reduced microphone gains to improve audio quality.
B-14546	Major	Several issues have been addressed in the configuration tool for the mono headset which could lead to it generating incorrect PSR files.
M-678	Minor	Pointers to opaque types (such as GAVDP) in a VM application sometimes failed to display correctly in xIDE, even when the type was fully defined elsewhere in the source file. This has been fixed.
M-780	Minor	If a project has been removed (e.g. deleted) and xIDE attempts to perform an operation in a workspace which referenced that project it now cleanly handles this. Previously it would fail with a memory exception.
M-821	Minor	Removing all projects from a workspace crashed xIDE. This has now been fixed.
M-829	Minor	When debugging a multi-project workspace in xIDE, the project selector in the debug toolbar could activate the wrong project or show the wrong project as being active. This has been corrected.
M-871	Major	xIDE could crash with a memory access if you chose to "restart all processors" in a combined DSP and VM project. This has now been fixed.
M-874	Minor	Stepping over kalimba instructions like <code>if [condition] call [address]</code> failed to stop on the following instruction if the condition was not satisfied. This has been fixed.
M-923	Major	Structures that referred to themselves in their definition (e.g. <code>struct list_item { int val; struct list_item *next; };</code> ) caused xIDE to crash when it attempted to display the type in the variables pane. This has now been fixed.

Table C.1: Issues Resolved in BlueLab v3.5

## Appendix D Issues Resolved in BlueLab v3.4

The following issues have been fixed since BlueLab v3.3 was released.

ID	Severity	Description
B-2770	Cosmetic	BlueLab3 (especially <code>make</code> ) does not understand file or directory names containing spaces. BlueLab now enforces this by refusing to install in a directory under <b>Program Files</b> (or any other path containing spaces.)
B-4522	Minor	The <code>avcontrol</code> application no longer leaks memory if left running with the AV dongle unplugged.
B5153	Minor	<code>SourceSize</code> can now return up to 3K for file sources; previously only the next 1.5K of each file could be accessed through <code>SourceMap</code> .
B-6160	Minor	<code>kalasm2</code> no longer crashes if asked to assemble malformed instructions involving a memory access in parallel with reading the result from a division.
B-6161	Major	<code>kalasm2</code> incorrectly accepted a memory read in parallel with a divide instruction, generating code only for the divide. This problem affected code such as:  <code>Div = rMAC / r1 r0 = M[I0, 1];</code>  This issue is now fixed and <code>kalasm 2</code> will report that a semi-colon is expected immediately after the divide instruction.
B-6894	Cosmetic	Attempting to send a message to an invalid task now panics the application immediately. Previously it would be panicked when the memory was accessed during message delivery. This makes it easier to diagnose the source of the problem.
B-6975	Minor	A HID dongle example application has been added.
B-7101	Minor	The Device Manager now returns to Active Mode before issuing a roleswitch to HCI. It previously sent the command irrespective of the mode and hence it could fail.
B-7115	Minor	Firmware changes have improved the Bluetooth bandwidth available to a device receiving streaming data whilst in a scatternet with a third device which was idle but in active mode.
B-7365	Minor	The <code>pbap_common</code> library has been added to BlueLab, providing functionality common to both the <code>pbap</code> server and client libraries.
B-7366	Minor	The <code>pbabs</code> library has been added to BlueLab, implementing the server role of the Phone Book Access Profile.
B-7367	Minor	The <code>pbabc</code> library has been added to BlueLab, implementing the client role of the Phone Book Access Profile.
B-7375	Minor	Using <code>DM_LP_WRITE_POWERSTATE_REQ</code> to configure new powerstates always resets the state machine to the initial state; previously the existing state was sometimes used.
B-7385	Minor	The behaviour of the DM policy manager has been improved so that it now only retries a failed power mode change a limited number of times. It previously retried indefinitely.
B-7901	Cosmetic	The BlueLab battery library now supports reading the internal charger voltage (for BlueCore4-Audio ROM and BlueCore4-Audio Flash parts.)
B-8028	Minor	<code>kalasm2</code> now requires that code lines containing multiple expressions should have commas separating them. For example, the following is valid syntax:  <code>r3 = M[r3 + r2], r4 = M[I0,1], r5 = M[I4, -1];</code>  <code>kalasm2</code> will, by default, issue a warning for lines which do not have comma separators. The command line flag <code>"-es"</code> promotes such warnings to errors. The command line flag <code>"-ns"</code> causes the presence or lack of separators to be ignored (that is, restores the old default behaviour). These options can be controlled from the project properties in <code>xIDE</code> .

ID	Severity	Description
B-8225	Fatal	Previously, kalasm2 reported an unspecified fatal error if source code has a block defined within a block. Nested blocks now report a suitable error message.
B-8387	Major	The a2dp_source_dongle example application will no longer panic on the fourteenth connection attempt to an a2dp sink if it is built as an analogue input device.
B-8389	Minor	BlueLab now includes a hid_keyboard reference application.
B-8918	Minor	The genparse tool now accepts a prefix command in the input file which allows multiple AT parsers to co-exist in a single application.
B-8967	Minor	TestTxData1, TestPcmLb, TestPcmExtLb, TestCfgXtalFtrim, TestPcmTone, and TestCodecStereoLb have been added to the test library.
B-9136	Minor	The default debug behaviour for new installations of xIDE is now to stop the current processor; previously it would stop all processors. This can be changed using Tools\Options\Debug.
B-9215	Fatal	It is no longer possible to crash BlueFlash by attempting to change the transport while a download is in progress.
B-9386	Minor	VM projects in xIDE now understand how to handle the .parse files used by genparse.
B-9589	Major	The hfp library now parses +CME ERROR notifications correctly.
B-9593	Minor	The ConnectionReadLocalName function has been added to the connection library to return the local friendly name.
B-9595	Minor	The ConnectionSmGetAuthDevice function has been added to the connection library to allow clients to retrieve link keys after pairing. (Use of this function is unusual since the connection library takes care of storing link keys for the application.)
B-9599	Major	Fixed a rare bug where the HCI would issue two identical Command Status Events (NOP, num_hci_command_packets=1) when attempting to allow the host to send another command packet. If the host was to send a command after processing the first event, but before seeing the second, a credit mismatch could occur.
B-9603	Minor	Unused parameters have been removed from the AghfpSlcConnect and AghfpSlcConnectResponse functions in the aghfp library.
B-9606	Minor	The AT commands +CIND and +CIEV in the aghfp library now send colons instead of equals signs.
B-9653	Minor	When establishing an RFCOMM connection, parameter negotiation is now performed for all DLCs on a mux.
B-9688	Minor	Calling ConnectionAuthDevice() with the Bluetooth Device address of the Default user will now result in the link key of the default device being deleted. The default device will also be removed from the security database immediately. This means that new connections to this device will require authentication.
B-9753	Minor	The aghfp library's API has been extended to provide the means to set up/shut down a call to a HS/HF device.
B-9811	Minor	kalasm2 incorrectly rejected type B add and subtract instructions if they included a memory access on the left of the arithmetic operator. The fault which only applied to opcodes where the AM field is 10 (0x2), is now fixed.
B-9832	Minor	The DSP code in the sco_dsp example application has been re-written to reduce latency, improve audio quality and serve as a basis for simple SCO processing code development.
B-9876	Minor	The supplied OBEX Server applications now set the Object Transfer bit of the Class Of Device. Although not required in the profile specifications. (except PBAP) some stacks use it for profile support.
B-9882	Minor	xIDE no longer crashes if DSP breakpoints are manipulated but the SPI cable has been unplugged.



ID	Severity	Description
B-9886	Minor	A dtmf (Dual Tone Multi-frequency) library has been added to the Kalimba library set.
B-9921	Minor	The DM has been improved so that when an ACL link enters a new Power State, the DM will automatically update the link policy to prevent the remote device changing the low-power mode to an undesired mode. For example, when the powerstate is active, all sniff/park/hold requests from the remote device will be rejected.
B-9961	Minor	kalstacktrace now checks if the DSP is loaded as well as running before attempting to read stack data from the chip.
B-9965	Minor	If kalstacktrace finds a rogue value in the stack it now displays it in the trace with "*** Corrupt ***" to allow the user to try and work out what has happened.
B-9984	Minor	A hid_mouse example application has been added.
B-9992	Major	The DSP assembler, kalasm2, silently accepted conditional memory writes, even though the Kalimba DSP on BlueCore3-Multimedia always executes the resulting write unconditionally. If assembling BlueCore3-Multimedia code, any attempt to use conditional memory writes will now correctly generate an error.
B-10002	Minor	The AghfpSetRingRepeatInterval function has been added to the aghfp library to control the behaviour when sending ring indications.
B-10046	Minor	vmSpy now reports the month correctly in its timestamps. Previously it was off by one.
B-10083	Minor	SourceSize on a region source is now limited to 3K. Previously it could report more than this for very large constants, but would fail when that memory was accessed through SourceMap.
B-10110	Minor	The cbops part of the core library has been split into a separate library. It has been redesigned to provide a more flexible method of routing audio through buffers on the DSP. The copy routines, the operators and the example applications that use the cbops library have been updated.
B-10136	Minor	vmbuilder now reports how much space is in use by the filesystem and how much remains.
B-10138	Minor	GOEP now uses StreamMove for sending data instead of memcopy.
B-10140	Minor	With the fix to B-10138, the offset parameter in send packet functions in the goep library which take a source became unused. This is because StreamMove can only send from the beginning of a source and it drops the data it moves when it finished. The offset parameter has been removed.
B-10141	Minor	The aghfp library now automatically attempts to negotiate a mutually acceptable SCO link from the specified packet type bit mask.
B-10146	Fatal	The hfp library's internal audio connection state is now initialised correctly.
B-10178	Cosmetic	Incorrectly named GOEP source files have been changed from geop to goep.
B-10187	Cosmetic	AGHFP_CALL_HANG_UP_IND now replaces AGHFP_CALL_TERMINATE_IND as the primitive used to indicate that a HF device wishes to reject/end a call. AGHFP_CALL_TERMINATE_IND is now used by the Call Manager to indicate that a call has actually been terminated.
B-10273	Minor	A library (piolib) has been added to allow multiple tasks to receive MESSAGE_PIO_CHANGED messages.
B-10313	Minor	Support has been added to SPP to enable it to register DUN SDP records. This means DUN can be a thin wrapper round SPP.
B-10580	Minor	SPP can now forward the CL_RFCOMM_CONTROL_IND which DUN needs to perform modem signalling

ID	Severity	Description
B-10614	Minor	RFCOMM has been improved so that if it receives an <code>RFC_PARNEG_REQ</code> for an already established DLC, it now responds with an <code>RFC_PARNEG_CFM</code> with the current parameters. It previously did not respond which could cause the client to hang.
B-10622	Minor	A bug has been fixed which meant the <code>SourceConfigure</code> and <code>SinkConfigure</code> of messages always behaved as if <code>VM_MESSAGE_SOME</code> had been passed as the value.
B-10632	Minor	A library implementing the MD5 hash function has been added (this is a VM library and is unsuitable for large volumes of data.)
B-10655	Major	Version 2.02 of <code>kalasm2</code> , as shipped with BlueLab 3.3, incorrectly assembled three instructions involving rMAC sub-register moves. The affected instructions were: <pre>rMAC2 = rMAC0; rMAC2 = rMAC1; rMAC0 = rMAC2;</pre> Please note that no libraries or applications shipped with BlueLab 3.3 made use of these instructions. This problem is fixed in BlueLab 3.4 ( <code>kalasm2</code> version 2.03).
B-10682	Major	Functions using more than 127 words of local variables no longer confuse the BlueLab linker. Previously it would report an unrealistically low stack usage figure, typically resulting in an application panic as the stack overflowed.
B-10687	Minor	Cleaning a DSP project now removes additional temporary files (those with <code>dm1</code> , <code>dm2</code> , <code>pm</code> , <code>kmap</code> , <code>kpp</code> , or <code>ksm</code> extensions.)
B-10695	Minor	<code>ConnectionWritePagescanActivity</code> no longer claims to have not been implemented when it has.
B-10697	Minor	Firmware changes have been made to the stream subsystem to reduce the latency of data flowing out of the DSP.
B-10726	Major	The <code>stereo_headset</code> application now stores the last codec that was used to stream audio, so when the headset connects back it can use the stored codec.
B-10736	Minor	The stack usage calculation made by the BlueLab linker now includes the <code>run_init</code> function as well as <code>main</code> . Previously it was possible for an application where <code>main</code> was trivial to be given enough stack space to run <code>main</code> but not <code>run_init</code> , resulting an application panic during the <code>run_init</code> function.
B-10743	Major	When used in a configuration where a full Bluetooth stack and a Virtual Machine application are being executed on-chip, it is possible that the responses to an inquiry-with-RSSI operation could be queued for the VM application faster than that application can process them. In extreme cases, this could lead to the queue overflowing and the device becoming unresponsive. This flow control issue has been resolved.
B-10775	Minor	The <code>connection</code> library now supports Inquiry Scan with RSSI.
B-10801	Major	An <code>AghfpSendError</code> command has been added to the <code>aghfp</code> library.
B-10818	Major	The <code>a2dp_source_dongle</code> application, when configured to use the wolfson WM8731, now correctly sets the input gain once the codec has been configured.
B-10829	Minor	The firmware has been updated to prevent the application receiving <code>L2CA_DATAWRITE_CFM</code> primitives which arrive while the link is being disconnected.
B-10846	Minor	When reporting incompatibilities between a VM application and the BlueCore firmware, the <code>vmbuilder</code> tool now reports the functions which are causing the problem. Previously it just reported the trapsets containing those functions.
B-11001	Major	The current consumption of the <code>stereo_headset</code> application in BlueLab v3.4 has been reduced to match that of the <code>av_headset_hfp</code> application in BlueLab v3.2.
B-11015	Major	Several errors have been fixed in the HFP service record of the <code>aghfp</code> library.

ID	Severity	Description
B-11123	Minor	A new helper function, <code>RegionMatchesUUID128</code> has been added to the <code>region</code> library.
B-11134	Minor	The <code>aghfp</code> library will now send blank CLIP notifications if no caller id details have been specified.
B-11140	Minor	The <code>TransformPollTraffic</code> function has been added to detect activity on connected streams.
B-11141	Minor	<code>TransformFromSource</code> and <code>TransformFromSink</code> have been added to find the transform connected to a stream.
B-11158	Minor	The <code>aghfp</code> library primitives <code>AGHFP_AUDIO_CONNECT_CFM</code> and <code>AGHFP_AUDIO_DISCONNECT_IND</code> now use the correct enumerated type for the returned status code.
B-11181	Major	When a VM application was reading data from the USB bulk endpoint, data flow could suddenly stop and never restart. The stream subsystem has been updated to prevent this happening.
B-11210	Minor	Support has been added for Agilent 3030/3040 mouse sensors.
B-11225	Minor	<code>.psr</code> files with the name of the project are now passed through the C pre-processor before being passed to <code>pscli</code> . This allows tests for defined symbols to be used in the <code>.psr</code> file.
B-11228	Minor	An issue has been resolved which could prevent xIDE from locating source files corresponding to DSP source code.
B-11266	Minor	The Agilent sensor code now checks the sensors product ID and panics if the ID is unknown.
B-11276	Minor	The <code>hid_mouse</code> application now supports Agilent 2030/2051 and 3030/3040 in a single application.
B-11332	Fatal	Memory leaks have been fixed that occurred when processing <code>AT+CLIP</code> and <code>AT+CHLD</code> commands. A race condition that could occur when sending an AT command if the underlying RFCOMM sink had just been removed, has been fixed. All issues would have ultimately resulted in a firmware panic.
B-11396	Minor	The <code>stereo_headset</code> application now does not enable MP3 support as default. It must be turned on using a user PS key.
B-11417	Minor	GOEP Remote get commands referred to <code>GOEP_REMOTE_GET_DATA_IND</code> this has been corrected to <code>GOEP_REMOTE_GET_MORE_DATA_REQUEST_IND</code> .
B-11437	Minor	Support for the HID keyboard matrix sensor type has been added.
B-11453	Minor	The <code>aghfp</code> library no longer rejects unrecognised AT commands by responding with <code>ERROR</code> . It is now the responsibility of the app to handle unrecognised AT commands.
B-11471	Minor	Due to a bug in the Kalimba assembler zeroing bank 2 registers would always be coded as a type A instruction. There is a type C instruction which could be used and would allow more flexible parallel memory accesses. This bug has been resolved and the Kalimba library code has been updated to reflect this.
B-11501	Minor	Support for external events in <code>ButtonParse</code> has been added.
B-11504	Minor	<code>Buttonparse</code> now works with active low PIOs by using <code>PSKEY_PIO_WAKEUP_STATE</code> .
B-11531	Minor	<code>app/ps/ps_if.h</code> now includes the value of <code>PSKEY_PIO_WAKEUP_STATE</code> for use by <code>buttonparse</code> .
B-11534	Minor	The VM application can now send reports on the HID interrupt channel.
B-11541	Minor	Hid Keyboard security has been improved
B-11575	Minor	BlueLab 3.4 includes the same version of the mono headset as the headset update kit made available for BlueLab 3.3.

ID	Severity	Description
B-11576	Major	The <code>connection</code> library has been updated connection failure due to timeout correctly.
B-11577	Major	CPU usage when handling HID input reports has been reduced.
B-11599	Minor	New <code>SourceConfigureHidSensor</code> traps have been added to configure HID sensors. These supersede the use of <code>SourceConfigure</code> for this (as used in BlueLab v3.3), adding type safety and additional parameter checking.
B-11639	Major	When using the raw transport, it was possible for a burst of data arriving on the UART to be ignored if it had a particular timing and no further data was ever received. This no longer occurs.
B-11656	Minor	The task registered using <code>MessageSystemTask</code> now receives <code>MESSAGE_USB_SUSPENDED</code> messages when BlueCore suspends and resumes on the USB bus. These are only sent when BlueCore is self-powered.
B-11690	Cosmetic	Minor changes in coding style have been made to reduce the code footprint of the <code>hfp</code> , <code>aghfp</code> and <code>connection</code> libraries. These have reduced the size of the <code>mono</code> headset by over 4% compared to BlueLab v3.3.
B-11725	Minor	<code>StreamConfigure(STREAM_UART_CONFIG, ...)</code> now only modifies settings if the user transport is selected. Previously it could be called for any transport, with undefined consequences.
B-11790	Minor	The response and hold functions in the <code>aghfp</code> library have been revised to better support real use cases.
M-443	Cosmetic	Double-clicking on a BlueStack primitive in the output tabs no longer causes xIDE to prompt for a non-existent file.
M-469	Major	Stepping over functions in DSP code in xIDE incorrectly stepped into the function. It now behaves correctly.
M-478	Minor	xIDE no longer produces misleading messages when debugging DSP applications in their own workspace.
M-493	Major	If a breakpoint was set at a multiple word DSP instruction, then xIDE would only execute the final word of the instruction when resuming execution after hitting the breakpoint. This issue is now resolved.
M-522	Fatal	Data symbols are now available when debugging DSP applications using xIDE, in both the variable and watch windows.
M-730	Major	xIDE now discards content from the debugger output windows to keep them below 1000 lines and avoid excessive memory consumption when running for extended periods.
M-758	Minor	xIDE now remembers window positions on a per-project basis; previously if two projects had the same kind of window open, the windows would reopen in the same location.
M-759	Major	<b>Run</b> in xIDE previously ran the active project, along with the remaining projects if action on run is set to <b>Start all processors</b> . This behaviour was undesirable since the DSP application should be launched by the VM application. This is fixed - running now always selects the VM project if one is present.
M-766	Minor	Multiple projects in a workspace can include the same source file. If a breakpoint is set in the source file xIDE will locate it in the current project if it includes the file. Otherwise it sets the breakpoint in the first project which does include the file.
M-773	Major	Running from breakpoints now works as expected when interrupts are enabled, rather than merely executing an interrupt.
M-790	Major	Kalimba watch window now understands a subscript format. For example: <code>VarName[Offset]</code> displays the word of memory at the address of <code>VarName+Offset</code> .
M-814	Minor	xIDE now correctly preserves the location of undocked windows between sessions.
M-828	Minor	Kalimba breakpoints sometimes did not work when the vm was restarted by the debugger. This issue has been resolved.

ID	Severity	Description
M-854	Minor	Under some circumstances, breakpoints set on lines without any code would be moved to sensible lines and the following message generated in the debug window: "Failed to install breakpoint at address [incorrect address], is this really RAM?". This issue has been resolved.
M-862	Minor	xIDE now notices that the dsp has stopped when it hits a data breakpoint.
M-863	Minor	The Kalimba DM breakpoint dialog no longer rejects symbols containing underscores.
M-866	Minor	Writing to registers no longer causes the kalimba to jump to the interrupt service routine.
M-867	Minor	The kalimba symbol table on occasion became corrupt after the second time the debugger was started, causing breakpoints to behave erratically. This issue is now resolved.
M-868	Minor	Running from a dsp break instruction no longer crashes the dsp application.

**Table D.1: Issues Resolved in BlueLab v3.4**

## Appendix E Issues Resolved in BlueLab v3.3

The following issues have been fixed since BlueLab v3.2 was released.

ID	Severity	Description
B-514	Minor	gcc saves constant memory by placing zero initialised global variables into a memory segment that is zero initialised at start-up. They were previously treated in the same way as any other constant initialised variables.
B-3551	Minor	The GOEP & FTP client libraries now implement the optional OBEX level authorisation feature.
B-3584	Minor	HID streams and transforms have been added to BlueLab3.
B-4355	Minor	The <code>connection</code> library has been optimised to use fewer globals.
B-4801	Minor	<code>PcmClearRouting</code> and <code>PcmClearAllRouting</code> calls have been added to the PCM library; these are convenience functions which are equivalent to calling <code>PcmRateAndRoute</code> .
B-4804	Minor	Type B instructions (those involving a constant) can contain only one memory access, but <code>Kalasm2</code> would incorrectly accept code of the form <code>r? = M[r?] + M[k16]</code> , generating code corresponding with the instruction <code>M[k16] = rN + rN</code> instead of reporting an error. This is now fixed.
B-4826	Minor	Support of Radio Power Tables for EDR has been added, ( <code>PSKEY_LC_ENHANCED_POWER_TABLE</code> ) in <code>PSTool</code> .
B-4832	Minor	<code>Kalasm2</code> would incorrectly interpret binary '-' as '+' in some circumstances, such as in the code: <code>r1 = M[r1 - 1]</code> ; This is now fixed.
B-4833	Minor	<code>kalasm2</code> would incorrectly accept <code>M[r1-r2]</code> in an instruction. This has now been fixed.
B-5093	Minor	<code>kalasm2</code> would incorrectly accept <code>rMAC</code> sub-registers as source operands, coding them simply as <code>rMAC</code> . This is now fixed.
B-5136	Minor	<code>kalasm2</code> now outputs a memory usage summary for code and data groups.
B-5211	Major	The <code>ChargerEnable</code> , <code>ChargerSupressLed0</code> , and <code>ChargerStatus</code> functions have been added to support the charger hardware on BlueCore4-Audio ROM. Where appropriate these functions also support the charger hardware on BlueCore3-Audio Flash.
B-5214	Minor	The functions <code>PioDimLed0</code> and <code>PioDimLed0</code> have been added to control the dimmed LED hardware on BlueCore4-Audio ROM.
B-5778	Minor	The <code>mp3_decoder</code> project files for <code>stereo_headset</code> application have been moved into the BlueLab mp3 add-on and are not installed by default.
B-5836	Minor	<code>VmSetPcmClock</code> will now return <code>FALSE</code> when passed illegal values; previously it would indicate success but ignore the value.
B-5896	Minor	Using <code>xIDE</code> to single step and step over VM code is now faster.
B-6091	Minor	The automatic gain control algorithm used by BlueCore has changed, in a way which should reduce power consumption. The residual bit error rate on D8PSK is enhanced, and the maximum input signal level (primarily EDR) is raised.
B-6116	Minor	Support for HID (Human Interface Device) has been added.
B-6212	Cosmetic	gcc now has certain optimisations on small leaf functions turned on by default.
B-6227	Minor	The <code>ConnectionWriteInquiryAccessCode</code> function has been added to the <code>connection</code> library.
B-6281	Major	When streaming SBC audio from the <code>a2dp_source_dongle</code> to the <code>av_headset_hfp</code> , there were glitches every several hours. This was due to clock drift between the two devices. The problem has been addressed by DSP changes in B-6347.

ID	Severity	Description
B-6505	Minor	Scripts to help Matlab users to inspect DSP state (such as buffer levels) have been added to the <code>tools/matlab</code> directory.
B-6512	Minor	The <code>rfcomm</code> primitive set has been extended to include <code>RFC_EX_ESTABLISH_IND</code> primitive which contains the Bluetooth address of the remote device. If extended primitives are enabled this is sent instead of the <code>RFC_ESTABLISH_IND</code> primitive.
B-6516	Minor	Debugging code built with leaf optimisation no longer breaks the Call Graph functionality. (This includes the library code supplied with BlueLab33.)
B-6521	Minor	VM extended versions of the Device Manager Synchronous Connection primitives have been added.
B-6749	Minor	The <code>DM_SCO</code> primitives have been removed from Bluestack as they have now been deprecated by the <code>DM_SYNC</code> API.
B-6800	Cosmetic	Accessing L2CAP and RFCOMM data through streams is now mandatory. (This feature has always been used by the BlueLab3 connection library.) The ability to receive <code>DATA_IND</code> primitives from BlueStack has been removed, along with the parameters to <code>StreamConfigure</code> to control this.
B-7030	Minor	Added <code>DM_EX</code> versions of the <code>DM_SYNC_RENEGOTIATE_XXX</code> primitives which allow the VM to reference a connection using the Sink rather than HCI handle.
B-7033	Minor	A new feature has been added to the VM to allow it to access the USB Isochronous Out endpoint. This allows a device to send PCM audio to USB Host, such as a PC.
B-7036	Major	<code>connection</code> library L2CAP connections can now be handled by tasks other than the one registered to the PSM.
B-7042	Minor	A new AGHFP library implementing the audio component of the hands-free profile has been added.
B-7050	Minor	<code>xIDE</code> will now relink a VM application if it detects that a library has changed.
B-7092	Minor	The library call <code>CodecSetSideToneGain</code> has been added to control the sidetone gain on BlueCore4-Audio ROM.
B-7097	Minor	The MP3 decoder libraries available for BlueLab now support mpeg2 and mpeg2.5 sample rates of 8-22.025KHz.
B-7159	Minor	Previously, <code>kalasm2</code> displayed the string <code>NO_VERSION_CONTROL</code> instead of a version number. A version number has now been added, and should be quoted in requests for help.
B-7160	Minor	The version of <code>gcc</code> included with BlueLab now includes the BlueLab version number when you pass <code>--version</code> on the command-line.
B-7224	Minor	The <code>VmTransmitEnable</code> function has been added to disable the transmitter.
B-7266	Minor	The <code>hfp</code> library now uses the <code>hfp_connect_rejected</code> status code in the <code>HFP_SLC_CONNECT_CFM</code> message if the connect attempt fails due to the remote end rejecting the connection.
B-7321	Minor	The <code>connection</code> library now requests profile libraries to vote with their link policy settings on <code>rfcomm</code> disconnect.
B-7354	Minor	The <code>connection</code> library now asks tasks with sinks on a given ACL to vote with their link policy settings every time an audio connection is connected or disconnected on that ACL. This allows a profile library to specify a different link policy if it has an audio connection open
B-7437	Fatal	The unusual case of <code>StreamConnect</code> from the DSP to the DSP from a VM application is now handled correctly in the firmware.
B-7452	Fatal	The firmware could panic when a <code>DM_EX_SYNC_CONNECT_COMPLETE_IND</code> was generated with a status other than success. This has been fixed.

ID	Severity	Description
B-7476	Minor	The following new codec gain control traps have been added:  CodecSetRawInputGainA CodecSetRawInputGainB CodecSetRawOutputGainA CodecSetRawOutputGainB CodecEnableMicInputGainA CodecEnableMicInputGainB.
B-7490	Minor	The <code>gavdp</code> library now cleans up all connections properly if remote end does not respond to a CLOSE request.
B-7493	Minor	IR OBEX has the concept of parameters that are specific to a particular application. This has been implemented.
B-7501	Cosmetic	Final negotiated parameters (link type and bandwidths) are now passed to an application on successful creation of a synchronous connection.
B-7502	Minor	The <code>hfp</code> library will no longer inform its client of +CNUM, +BTRH or +CLCC notifications, sent by an AG, if they contain parameters that are out of spec.
B-7507	Minor	xIDE can now create <code>.button</code> or <code>.parse</code> files in BlueLab.
B-7584	Minor	The <code>hfp</code> library now passes a <code>HFP_CALLER_ID_IND</code> message to the client even if the AG did not send the number of the caller.
B-7611	Major	If a file was selected and successfully downloaded then changing the filename and trying to do a subsequent download caused a crash. This has been fixed.
B-7747	Minor	The VM will now immediately panic an application which attempts to call a NULL function pointer. Previously it would mysteriously restart the application.
B-7762	Minor	The <code>spp</code> library now handles the <code>MESSAGE_SOURCE_EMPTY</code> message.
B-7792	Minor	The <code>avrcp</code> library now stores the service records it needs in constant space.
B-7801	Minor	The battery charger current on BlueCore4-Audio ROM can now be controlled from the VM application using the <code>ChargerSetChargeCurrent</code> call.
B-7831	Minor	If a <code>.button</code> file is included in an application, PIO states are now read immediately when the application starts, so events are reported as defined in the <code>.button</code> file from startup.
B-7841	Minor	<code>Buttonparse</code> can now decode PIO events that are separate from PIOs that are used for buttons.
B-7862	Minor	Previously, Kalasm2 would not allow code to completely fill available program memory, because automatically generated zero prefix instructions were being counted, despite these being stripped out at link time. This problem has now been fixed.
B-7944	Major	An issue has been resolved in BlueFlash which could lead to it reporting an incorrect firmware ID.
B-7952	Minor	An issue has been resolved in the SPI transport which could prevent tools such as BlueFlash and xIDE in BlueLab from correctly identifying the chip being used.
B-7953	Minor	The <code>hfp</code> library message <code>HFP_INTERNAL_SDP_REGISTER_CFM</code> is now allowed in the connecting state.
B-8000	Minor	The BlueLab reference documentation is now built at the same time as the VM libraries, so it automatically reflects any local changes that might have been made.
B-8011	Minor	A display library has been added for controlling an LDA33S481J1D module (containing an PCF8548 LCD controller) over I <sup>2</sup> C.
B-8040	Minor	HFP will now issue a request for extended error result codes if the AG supports them.



ID	Severity	Description
B-8047	Minor	The <code>CL_DM_MODE_CHANGE_EVENT</code> message has been added to the <code>connection</code> library to allow the application to monitor power-saving settings. Applications must call <code>ConnectionInitEx</code> with suitable parameters to enable this message.
B-8115	Minor	The <code>gavdp</code> and <code>a2dp</code> libraries now notify their client when link loss occurs with a new error code in the close message.
B-8139	High	HFP will now inform applications of the phone number type (i.e. national, international etc) when <code>+CNUM</code> , <code>+CLIP</code> , <code>+CCWA</code> and <code>+CLCC</code> notifications are received from the AG.
B-8153	Minor	The <code>hfp</code> library now sends VGS commands when connected over an HSP connection with a Fujitsu F900iT.
B-8214	Minor	<p>A problem has been observed when BlueCore is in a scatternet or piconet with two links, one of which is in sniff and the other is streaming data to BlueCore. A typical use case is an AV headset that is streaming AV data from a PC while also connected to a phone, which periodically unsniffs the link and sends data such as signal strength reports.</p> <p>When the sniffed link is unsniffed, BlueCore pauses data on all links during the unsniff of the sniffed link, unpausing afterwards. This causes delays in the data on the streaming link, which lead to breakups in an audio stream.</p> <p>The firmware has been changed so that it does not pause data on all links in this scenario. This resolves the problem in the case where the headset is master of both links and in the case where the headset is master of the AV link and slave of the phone. Work to support other scatternet scenarios is ongoing.</p>
B-8264	Major	The <code>cbop</code> operator <code>upsample</code> and <code>mix</code> would incorrectly update the parameter structure (corrupting the linked list) if it was used as two mono operators processing a stereo stream. This has been fixed.
B-8292	Major	The <code>hfp</code> library has been modified to correctly parse all possible formats of <code>+CLCC</code> , <code>+CNUM</code> and <code>+COPS</code> notifications received from an AG.
B-8316	Fatal	When running higher layers on chip (either with a VM application or when using BCHS with L2CAP or higher layers on chip) and when running more than one simultaneous connection, it was possible for the firmware to leak flow control tokens until eventually L2CAP data flow would stop on all but one link (and that link might run slowly). This has been resolved.
B-8318	Minor	The <code>StreamEnableSniffSubrating</code> calls has been added to enable subrating on a connection.
B-8416	Minor	During a GOEP connect request where the server forces authentication, a client can cancel the request by issuing a disconnect. GOEP accepts the disconnect and cancels the connect request.
B-8430	Minor	A change has been made to the code generator for gcc which can prevent a fatal register spill when comparing 32-bit values.
B-8435	Minor	A headset application, based closely on BC4-headset, has been added to BlueLab.
B-8441	Major	gcc no longer experiences an internal compiler error in certain code involving a <code>memcpy</code> between structure elements.
B-8455	Minor	A new <code>stereo_headset</code> application (corresponding to BlueTunes1) has replaced the <code>av_headset_hfp</code> application which shipped with BlueLab3.2.
B-8460	Minor	With an active SLC in sniff mode, data sent over the link will force the link exit sniff and become active for 1 second. Previously, this was 5 seconds. Some phones spam the headset with CIEV messages which resulted in higher standby current consumption.
B-8473	Minor	gcc no longer experiences an internal compiler error in certain code involving a <code>memcpy</code> between structure elements.
B-8493	Minor	An enhanced firmware variant for BlueCore3-Multimedia has been added to BlueLab3.3 which offers limited EDR support.

ID	Severity	Description
B-8497	Major	gcc no longer generates invalid multiplies by register AH and AL.
B-8536	Minor	genparse no longer needs the <code>-task</code> , <code>-dict</code> and <code>-find</code> command-line options; they are now the default.
B-8538	Minor	The connection library no longer sends a <code>CL_RFCOMM_DSICONNECT_IND</code> message to the client task if the local device rejected the rfcomm connect attempt.
B-8553	Minor	The USB Audio EndPoint descriptor in the <code>a2dp_source_dongle</code> application has been updated to include the <code>bRefresh</code> and <code>bSyncAddress</code> fields required by the USB2.0 chapter 9 tests.
B-8577	Minor	Previously, <code>kalasm2</code> allocated addresses to code and data based on which group had the least space remaining. This has been improved, such that group allocation follows the order of segment declarations in <code>default.asm</code> . For example, given a segment declaration <code>DM</code> corresponding to two groups, <code>DM1Group</code> and <code>DM2Group</code> , then, for any allocations to segment <code>DM</code> , <code>DM1Group</code> will be filled to capacity before any data is allocated to <code>DM2Group</code> .
B-8607	Minor	A <code>unified_no_fs</code> firmware variant for BlueCore4-External has been added to BlueLab3.3 for specific applications which cannot use the read-only filesystem.
B-8615	Minor	The gcc code generator has been improved to give slightly smaller output in certain code similar to <code>a=b</code> where <code>a</code> is 32-bits wide and <code>b</code> is 16-bits wide.
B-8728	Cosmetic	The accuracy comments of the <code>sin</code> routine have been updated, as they previously implied it was less accurate than it actually is.
B-8731	Minor	The <code>PSKEY_</code> prefix has been removed from the Programmer IDs. This helps location of keys by allowing skipping to a key in PSTool by pressing the letter it begins with.
B-8786	Minor	Firmware support has been added for Persistent Store reading from the DSP.
B-8787	Minor	Firmware support and VM access have been added for passing longer messages between the DSP and the application.
B-8824	Cosmetic	If the selected firmware cannot be found for the hardware in use, <code>xIDE</code> now produces a sensible error message (previously it would complain about being unable to determine if the firmware supported the filesystem).
B-8841	Minor	The identifiers for some BlueCore variants were out of date. These have been updated.
B-8886	Minor	The <code>connection</code> library now correctly rejects an rfcomm connection attempt from a remote device when the channel is already in use
B-8919	Minor	gcc no longer generates incorrect code for certain obscure circumstances involving sign extension of bit fields.
B-8944	Minor	The <code>codec_decoder</code> Kalimba app sometimes produced slight ticking clicks in the right earphone. This was due to the interrupt rate for audio copies not being quite fast enough in certain instances. To speed up the interrupt rate the timer scheduling function <code>\$timer.schedule_event_in_period</code> is now used rather than <code>\$timer.schedule_event_in</code>
B-8951	Major	An issue with gcc has been fixed where function pointers in arrays or structs could (in some limited circumstances) cause the compiler to crash.
B-8956	Major	A cross-over audio scenario which could cause interop problems with the Nokia 6230 has been worked around in the <code>hfp</code> library.
B-9031	Major	If <code>EnergyEstimationOn()</code> was invoked from the VM, even if it returned a success value, no <code>MESSAGE_ENERGY_CHANGED</code> would subsequently be generated. This has been resolved.
B-9035	Minor	A new function, <code>VmAmuxClockEnable</code> has been added to enable and disable the clock which some BlueCore4 variants can output on AIO0.
B-9040	Minor	Saturation code has been added to the SBC <code>joint_stereo_processing</code> routines of the encoder and decoder. Note: Previous tests have not shown overflow occurring, but the addition of some saturation code was thought worth while as a safety measure.

ID	Severity	Description
B-9042	Minor	MessageSystemTask and MESSAGE_USB_ENUMERATED have been added to the VM libraries to allow an application to receive an indication when USB enumeration is complete.
B-9043	Minor	The cbops routines upsample_mix_mono and upsample_mix_stereo incorrectly check the amount of tone data used in each call. This means the routine will always assume there is tone data available to mix.
B-9047	Fatal	Fixed a problem where the USB to-host Isochronous Endpoint which had been configured from the VM would be disabled following USB Reset. This prevented USB Audio flowing to the PC.
B-9100	Major	The codec library now provides a new API, CodecSetInputGainNow and CodecSetOutputGainNow for setting the codec gain immediately.
B-9172	Minor	A user editable filter has been added to PSTool's display of PS Keys.
B-9175	Minor	StreamSourceConfigure and StreamSinkConfigure can now be used for connected streams and have a boolean return value to indicate if the request was not possible.
B-9356	Minor	Nested interrupt support in the Kalimba DSP library has been turned off by default to ease debugging with xIDE. To enable it see the define comment at the top of interrupt.h
B-9372	Minor	Fields have been added to the VM USB EndPointInfo structure to allow a VM application to append class specific fields to an EndPoint descriptor.
B-9374	Minor	USB enumeration for USB Audio devices has been updated in order to interoperate with MacOS X.
B-9413	Minor	The VM_SOURCE_MESSAGES and VM_SINK_MESSAGES keys can now be used with SourceConfigure and SinkConfigure to selectively suppress MORE_DATA and MORE_SPACE messages.
B-9470	Minor	A bug has been found where by the routines \$cbuffer.set_write_address and \$cbuffer.set_read_address could overwrite the memory at address 0. This would only occur if code accessed an MMU port outside of an interrupt when a stream disconnection occurred. This bug has been fixed so that address 0 is not written to.
B-9473	Minor	A connection library API has been added to allow application to register trusted devices.
B-9481	Minor	The font library functions are now supported by the unified firmware supplied with BlueLab (previously they were only present in special customer-specific builds.)
B-9485	Minor	Support has been added to kalpac2 and the firmware to allow the DSP on BlueCore3-Multimedia to access data values from flash on BlueCore3-Multimedia_r03 and later. See examples/kalimba_flash_access_example.
B-9512	Cosmetic	Shortcuts to PSTool, BlueFlash, VM Spy and AVControl utilities has been added to the Start menu.
B-9535	Minor	In goep_handler.h function handleSDPServSrchAttrCfm, there is a check to see if the returned SDP attribute contains an RFCOMM channel. The code was repeated, a copy of the code has been removed
B-9539	Minor	xIDE now passes .button files through the C preprocessor which allows #ifdef to be used to adjust for multiple hardware configurations.
B-9579	Minor	Kalimba projects now have individual project properties to allow more useful properties to be listed in a user-friendly way.
B-9664	Minor	In the test_tonegen example application in BlueLab the psr file was incorrectly named, matching the name of the Kalimba project not the VM project.
B-9727	Major	DFUWizard is not included with this release of BlueLab.
B-9759	Minor	Values being sent over byte-oriented streams to the host (StreamHostSink) could be sign-extended into the adjacent byte. This has been fixed.

ID	Severity	Description
B-9787	Minor	The Kalimba Matlab tools <code>kalvarprs</code> and <code>kalprocessor</code> were locked between calls which meant they were not cleared by <code>clear all</code> . This is unnecessary and the lock has been removed.
B-9812	Major	Attempting to <code>StreamConnect</code> a <code>FileSource</code> or <code>StreamAudioSource</code> to a <code>PcmSink</code> when PCM port 0 has been configured to a rate of 0 no longer causes a firmware panic.
B-9830	Major	The <code>sco_dsp</code> and <code>sco_master</code> example applications have been updated to use <code>CodecSetRawInputGainA/B</code> and <code>CodecSetRawOutputGainA/B</code> instead of <code>CodecSetInputGainA/B</code> and <code>CodecSetOutputGainA/B</code> .
B-9843	Major	On BlueCore3-Multimedia, the internal CODECs now operate correctly when routed to slots 2 or 3.
M-375	Minor	Fixes have been made to make stepping Kalimba in xIDE faster.
M-463	Minor	Go To Line now works correctly in xIDE when the active project is a Kalimba project.
M-480	Major	Many problems with multi-project workspaces in xIDE have been fixed.
M-524	Cosmetic	Starting a search in xIDE with some text selected now defaults to searching for that text.
M-579	Cosmetic	An issue has been resolved which could result in xIDE intermittently ignoring uses of <b>F4</b> to go to the next compile error.
M-591	Minor	File Open from within xIDE now includes <code>.button</code> , <code>.parse</code> and <code>.asm</code> files in the default filter.
M-601	Major	Changing the number format of a DSP register in the register window in xIDE no longer changes the on chip value of the corresponding register.
M-605	Minor	The BlueStack tab in xIDE now correctly decodes the states in the <code>DM_LP_WRITE_POWERSTATES_REQ</code> primitive.
M-652	Major	Hitting the escape key when xIDE dialogues appear now cancels the operation; previously the operation could sometimes proceed.
M-664	Minor	An issue has been resolved which could result in xIDE opening the same file twice in two different buffers.
M-699	Minor	xIDE could fail to display the parameters of functions that don't contain any automatic variables. This has been fixed.
M-703	Minor	xIDE now shows the full path of open files as a tool tip if the mouse pointer is held over the file tab of the editor window.
M-726	Minor	xIDE no longer tries to connect over SPI to identify the chip being used when compiling a single file (using <b>Ctrl+F7</b> ).
M-748	Major	Using a single workspace for VM and Kalimba projects caused a slowdown in traffic to and from the chip. This has been fixed.
M-750	Fatal	The licence file has been modified to allow use the BlueLab version of xIDE from within a Terminal Services session.

**Table E.1: Issues Resolved in BlueLab v3.3**

## Appendix F Issues Resolved in BlueLab v3.2

The following issues were fixed in the BlueLab v3.2 release.

ID	Severity	Description
B-998	Minor	If a peer device opens and then closes a SCO connection before the application has a chance to respond with <code>DM_SCO_CONNECT_RES</code> , a <code>DM_SCO_DISCONNECT_IND</code> is now sent (previously no primitive was sent to indicate the disconnection.)
B-3579	Minor	The <code>MessageStatusTask</code> and <code>StatusQuery</code> calls have been introduced; these allow querying of link status which was performed using the <code>event</code> library in BlueLab2. The <code>examples/test_status</code> application illustrates their use.
B-3839	Minor	The <code>connection</code> library no longer rejects multiple rounds of RFCOMM parameter negotiation.
B-4026	Cosmetic	The security related function calls in the <code>connection</code> library now take a <code>uint32</code> as the channel parameter (previously they took a <code>uint16</code> which was passed to BlueStack as a <code>uint32</code> .)
B-4175	Cosmetic	The code generated by <code>genparse</code> has been adjusted to lint cleanly, but no functional changes were involved.
B-4390	Minor	The <code>examples/test_headset</code> application supplied with BlueLab3.0 and 3.1 was incomplete and has been removed from BlueLab3.2. It will be replaced with a full application in a later release.
B-4412	Minor	In the <code>a2dp</code> library a number of debug panics have been removed. If this error condition occurs the <code>a2dp</code> library now sends an error message instead.
B-4572	Major	gcc no longer generates invalid calling patterns for obscure cases involving 32-bit division where the result is passed to functions with many arguments.
B-4639	Minor	xIDE now correctly handles the case where both a <code>.button</code> file and the <code>.c</code> file it generates are part of a project. Previously it would cause an error from the linker.
B-4699	Fatal	SPI transports, no longer fail on fast (> 2.1 GHz) machines. The problem was caused by a signed integer being used for storing the clock speed.
B-4925	Minor	The <code>AV_Control</code> debug application for the PC no longer displays the SBC format and bitpool. This is a result of changes made to CODEC negotiation in the on-chip application.
B-5007	Minor	On receiving a <code>DM_SM_ENCRYPTION_CHANGE</code> message from BlueStack the <code>connection</code> library now sends a <code>CL_SM_ENCRYPTION_CHANGE_IND</code> message to each task that owns a connection on that ACL.
B-5011	Minor	The <code>ConnectionSmEncrypt</code> function has been added to the <code>connection</code> library.
B-5012	Minor	The <code>CL_SM_REMOVE_DEVICE_CFM</code> message has been removed from the <code>connection</code> library interface as it was never sent.
B-5038	Fatal	kalasm2 should no longer report <code>ERROR linking ????.klib "already in Module \$mymodule"</code> .
B-5086	Minor	The documentation for the <code>ConnectionSmSetSdpSecurityIn()</code> function has been updated to make its usage clearer, and its use in the supplied code has been made more consistent.
B-5133	Minor	Within BlueLab applications, <code>MORE_DATA</code> messages used to be generated for every piece of data which arrived. The firmware has been updated to combine such messages automatically when they would be adjacent. This can vastly reduce the number of such messages seen by the application, and reduces the likelihood that a flood of messages can crash the firmware.
B-5167	Minor	The <code>a2dp_source_dongle</code> application no longer initialises a superfluous instance of the <code>codec</code> library when <code>USB_AUDIO_MODE</code> is defined.
B-5230	Fatal	kalasm2 now works reliably on Windows XP SP2; problems included errors being reported incorrectly and also incorrect assembler output.

ID	Severity	Description
B-5236	Minor	The BlueLab toolchain has been extended to support large read-only filesystems on custom hardware using 16-Mbit of flash.
B-5248	Minor	gcc no longer outputs redundant nop instructions.
B-5249	Minor	The hfp library now sends a HFP_ENCRYPTION_CHANGE_IND message to the application task in response to receiving a CL_SM_ENCRYPTION_CHANGE_IND message from the connection library.
B-5250	Minor	In HFP mode, if a remote device disables encryption and does not re-enable it within 5 seconds, the av_headset_hfp application will now disconnect the Service Level Connection to that device.
B-5277	Minor	The a2dp library now allows switching between SBC rates by passing in configuration values, rather than requiring the profile library to be rebuilt.
B-5325	Minor	The gavdp library Reconfigure error codes have been reworked to be compliant to AVDTP test TP/SIG/SMG/BI-14-C
B-5332	Minor	The connection library has been updated to use the newly added power states interface to BlueStack. The connection library no longer needs to manage switching between the different low power modes as this is done automatically by BlueStack based on a power table supplied to it.
B-5339	Minor	A vGen library has been added to help OBEX applications generation vCard-like values.
B-5380	Major	The connection library now correctly handles crossover between incoming and outgoing L2CAP connections.
B-5390	Minor	Fixed a memory leak in av_headset_hfp, av_headset, and a2dp_source_dongle when AVRCP requests are received in unexpected states.
B-5397	Minor	The avrcp library now rejects L2CAP connection requests if it is currently not in the correct state to accept an incoming connection.
B-5414	Minor	Adding and removing files from the image/ directory now forces the read-only filesystem to be rebuilt (previously it was only rebuilt if a file was added with a date-stamp later than the last time the filesystem was built.)
B-5425	Minor	When removing a device from the list of paired devices the connection library did not remove it from the security manager in BlueStack. This would allow a device that had been removed from the list of paired devices to still connect, until a reset had been performed.
B-5426	Minor	A debug panic has been removed from the connection library; it could be triggered when it received an RFC_ESTABLISH_CFM message for a connection that had already been disconnected.
B-5427	Cosmetic	The battery library function BattInit has been renamed to BatteryInit.
B-5438	Major	The A2dpConfigure () function has been removed because it had no effect and if exposed required qualification.
B-5440	Minor	The l2cap_mtu parameter has been removed from the GavdpInit function as it was not being used.
B-5458	Major	In the spp library, the SPP_CONNECT_CFM message now correctly contains the SPP profile instance pointer.
B-5465	Minor	The av_headset_hfp headset application cancels the BUTTON_PLAY_PAUSE_REL message on a failure to create an SLC connection so it no longer continually attempts to connect the SLC if the first attempt failed.
B-5475	Minor	The connection library now sends a CL_DM_ACL_CLOSED_IND message whenever an ACL is closed. The message is sent to the task registered with the connection library as the main client task.
B-5476	Minor	The hfp library now correctly handles rejecting a call while another call is active.
B-5480	Minor	The gavdp library now rejects malformed set_configuration requests where more than one bit is set in any particular configuration field.

ID	Severity	Description
B-5485	Medium	MPEG-2/4 AAC support added in a2dp library
B-5492	Minor	The <code>goep</code> library no longer calls <code>ConnectionSmSetSdpSecurityOut</code> to disable SDP security; it now leaves this policy decision to the application.
B-5496	Minor	The debug variant of the <code>ftpc</code> library has been updated to perform additional checking (as with other BlueLab libraries).
B-5498	Minor	The debug variant of the <code>ftps</code> library has been updated to perform additional checking (as with other BlueLab libraries).
B-5510	Minor	<code>GAVDP_CONFIGURE_CODEC_IND</code> message no longer includes a <code>media_sink</code> field. This field was invalid and the SEID should be used to identify the connection.
B-5514	Major	Fixed a bug in the AVRCP state machine of the <code>av_headset_hfp</code> and <code>av_headset</code> applications where receiving a START with an AVRCP connection already established would confuse the state machine and prevent remote control commands being sent to the source.
B-5525	Minor	Ringtones can now be played from locations other than VM constant space, such as stack memory or dynamic memory.
B-5526	Minor	Playing ringtones from the file system via audio sequence rather than using streams is no longer supported.
B-5527	Minor	A number of fields in library messages have been renamed in order to conform with BlueLab coding conventions. Messages with pointer fields name <code>ptr</code> have had their length field renamed to <code>size_ptr</code> .
B-5528	Major	<code>gcc</code> no longer overwrites arguments in functions which use partially initialised unions.
B-5533	Minor	The <code>av_headset_hfp</code> headset application now accepts an incoming AVRCP connection when it is in the "ready" state. Previously it refused and then opened later.
B-5543	Minor	The <code>gavdp</code> library will now always return a <code>GAVDP_START_CFM</code> when there is a crossover between two devices directing <code>GavdpStart</code> at each other.
B-5557	Minor	A debug variant has been added for the <code>oppc</code> and <code>opps</code> libraries.
B-5564	Minor	When using stream-based RFCOMM connections from a BlueLab application, the RFCOMM streams are destroyed less aggressively. This means that the sink in an <code>RFC_RELEASE_IND</code> generated by BlueStack is valid whereas previously it was always zero.
B-5570	Minor	The <code>gavdp</code> library now determines whether to send a <code>GAVDP_OPEN_IND</code> or a <code>GAVDP_OPEN_CFM</code> message depending on the device opening the AV channels rather than on the SEP role.
B-5585	Minor	The <code>gavdp</code> library now delays creation of internal data structures until a new connection instance is being created.
B-5592	Minor	The <code>gavdp</code> library now delays creation of internal data structures until a new connection data is being created.
B-5598	Minor	An <code>ftp_server</code> application has been added.
B-5601	Minor	The <code>connection</code> library API functions <code>ConnectionSmSetTrustLevel</code> and <code>ConnectionSmDeleteAuthDevice</code> now return void instead of <code>uint16</code> .
B-5610	Minor	Error robustness of <code>sbc</code> and <code>mp3</code> decoding improved
B-5611	Fatal	<code>gcc</code> now generates more efficient code for 32-bit by 32-bit multiplication. (This also fixes an issue where the code could be incorrect in rare circumstances.)
B-5612	Minor	ISR (Interrupt Service Routine) now clears all length registers so that routines that are called from an interrupt have the length registers cleared.
B-5613	Minor	The naming convention for Kalimba DSP library routines has changed from <code>\$lib_routine</code> to <code>\$lib.routine</code>
B-5616	Minor	<code>gcc</code> now generates correct code for multiplying a 32-bit integer by a constant power of 2.

ID	Severity	Description
B-5623	Minor	In the <code>avrcp</code> library, <code>AvrcpConnectResponse</code> no longer expects a bluetooth address to be passed in.
B-5624	Minor	In the <code>avrcp</code> library, calling <code>AvrcpConnect</code> will now always return a confirmation message if the request fails.
B-5625	Minor	The debug version of the <code>connection</code> library now panics if an L2CAP connect response from the client contains invalid parameters.
B-5629	Minor	The <code>avrcp</code> library will now return confirmation messages for all API calls when the attempt fails, and not just when they are a success.
B-5631	Minor	The <code>examples/test_mp3decoder</code> application has been added to the MP3 add-on for BlueLab.
B-5639	Minor	PSR files have been added to the <code>a2dp_source_dongle</code> application to help configure the application for operation as a USB or analogue audio device. (These are selected automatically based on the project settings.)
B-5647	Minor	Reduced the sensitivity of the overflow check in <code>stream_decode.asm</code> in order to prevent it firing incorrectly with a bursty audio stream.
B-5649	Major	Putting multiple file systems (or applications) into a single DFU file no longer causes <code>dfubuild</code> to fail.
B-5658	Minor	It is now possible for a VM application to specify directly the analogue and digital gain settings for the internal CODEC on certain BlueCore devices. This can be done by setting bit 14 of the gain supplied to <code>CodecSetInput/OutputGain</code> . If this is done, bits 0..3 are written to the digital gain register and bits 4..6 are written to the analogue gain register.
B-5665	Minor	For more recent BlueCore variants, the PIO lines used to wake the chip from deep sleep can now be active low. This is controlled by <code>PSKEY_PIO_WAKEUP_STATE</code> .
B-5670	Minor	<code>AvrcpPassthrough</code> in the <code>avrcp</code> library will now send subunit data to the remote end correctly.
B-5674	Minor	A font lookup library has been added for a particular project (support for this is not present in the supplied firmware.)
B-5691	Minor	Tools and firmware have been modified to allow applications in the read-only filesystem to use a full 64Kwords of code space as well as 24Kwords of constants. (Previously the total of code and constant was limited to 64Kwords.)
B-5694	Minor	The PIOs used to drive the WM8731 are now configured during initialisation of the <code>codec</code> library.
B-5695	Minor	The <code>avrcp</code> library function, <code>AvrcpPassthrough</code> , now correctly truncates vendor data to 255 bytes.
B-5702	Medium	Modified the initial streaming state in <code>stream_decode.asm</code> so that it will start playing audio sooner than before. It previously started in <code>poorlink</code> which meant it could be several seconds before audio could be heard.
B-5703	Minor	A bug in the MP3 decoder has been fixed where <code>reorder_spectrum</code> wouldn't occur if only the right channel was using short windows.
B-5706	Minor	The Kalimba DSP decoders now start in their gobble state rather than <code>poorlink</code> to avoid an initial silence at the start of tracks.
B-5732	Minor	<code>BlueFlashCmd</code> now supports querying BlueCore for the chip version and flash size; this is used to automatically identify suitable firmware.
B-5748	Minor	The <code>HfpGetBdaddr()</code> function has now been removed from the <code>hfp</code> library API. The address of the remote device can be obtained from the <code>connection</code> sink.
B-5749	Minor	The <code>HFP_SLC_CONNECT_CFM</code> message sent from the <code>hfp</code> library now includes the sink for the SLC connection.



ID	Severity	Description
B-5751	Minor	When the mp3 decoder was requested to skip over an 'mp3 granule' (equivalent to half an mp3 frame) it would actually consume a whole mp3 frame. This caused it to consume data twice as quickly as expected during the 'poorlink' condition. To get around this problem the 'poorlink percentage' in the past had to be half the value that you'd imagine it should have been.  This bug has been corrected, i.e. the decoder correctly skips granules (half frames) when requested.
B-5752	Minor	On exiting the poorlink state, the Kalimba DSP decoders now start buffering rather than entering the gobbling state.
B-5759	Minor	In order to be consistent with the other BlueLab libraries the <code>avrcp</code> library no longer defines the <code>AVRCP_DISCONNECT_CFM</code> message. <code>AVRCP_DISCONNECT_IND</code> is used instead.
B-5765	Minor	The <code>avrcp</code> library now returns the status <code>avrcp_invalid_sink</code> in confirmation messages, if its functions are passed an invalid sink.
B-5766	Minor	The <code>avrcp</code> library now always returns the correct confirmation message for the API function called.
B-5767	Minor	<code>AvrcpSubUnitInfo</code> in the <code>avrcp</code> library now sends the page data correctly.
B-5771	Minor	The <code>avrcp</code> library message, <code>AVRCP_VENDORDEPENDENT_IND</code> , now contains the command type that was sent from the remote end.
B-5775	Minor	BlueLab upstream messages no longer contain pointers to data that their client must free. All such data is now allocated as part of the message so it is destroyed together with the message.
B-5780	Minor	The <code>gavdp</code> library now correctly rejects configurations which are not within the reported capabilities.
B-5784	Minor	All state in the <code>gavdp</code> library is now stored in the task instance; previously global data prevented multiple <code>gavdp</code> instances with differing client tasks.
B-5786	Minor	The <code>gavdp</code> library now correctly rejects configurations which are not within the reported capabilities.
B-5788	Minor	The <code>appquery</code> helper utility has been extended to report the traps supported by a firmware build; this is now used by the BlueLab makefiles to decide whether an application should be placed in the read-only filesystem.
B-5791	Minor	A firmware bug has been fixed which prevented <code>MESSAGE_ENERGY_CHANGED</code> from being delivered to a VM application.
B-5797	Minor	gcc now generates the correct labels for constant segment jump tables when optimising switches on values it can calculate at compile time.
B-5799	Minor	Passing a null bluetooth address to <code>AvrcpConnect</code> in the <code>avrcp</code> library will now cause a Panic in the debug build of the library.
B-5805	Minor	The sink is no longer passed in to many of the <code>avrcp</code> library API functions. It is stored internally within the library.
B-5808	Minor	The profile instance pointer is now the first field in all messages returned from the profile libraries.
B-5819	Minor	Some type definitions which were only relevant to BlueLab2 applications have been eliminated from the (shared) <code>vm_if.h</code> header file.
B-5830	Minor	The VM version of xIDE now provides stack backtracing functionality. <code>CallStack</code> and <code>Backtrace</code> variables windows have been added.
B-5863	Cosmetic	The <code>pio_if.h</code> header defined types which were used only for BlueLab2 and has been removed.
B-5864	Minor	The <code>PcmRoute</code> and <code>PcmRateAndRoute</code> calls now support Kalimba DSP-mode.
B-5866	Minor	Attempting to step over a switch statement in a VM app no longer causes xIDE to lock up in certain circumstances.

ID	Severity	Description
B-5870	Minor	The default PIN code for all supplied applications has been changed from "4444" to "8888"
B-5871	Major	The <code>a2dp</code> library now respects the local bitpool parameters set during initialisation.
B-5874	Major	<code>gcc3.3</code> is now less likely to fail with an internal error while compiling calls to <code>memcpy</code> involving pointers to pointers.
B-5890	Minor	A optimisation to the startup code for VM applications has saved one word of RAM in the global variables.
B-5891	Minor	The <code>hfp</code> library now handles <code>CL_RFCOMM_CONTROL_IND</code> messages sent by the <code>connection</code> library.
B-5893	Minor	The tools in BlueLab now support the read-only filesystem on 6-Mbit parts with suitable firmware. (Previously 8-Mbit parts were required.)
B-5894	Minor	<code>Step over/into</code> now copes with larger switch statements when debugging VM applications.
B-5898	Minor	As issue has been resolved which could cause warbling in the right channel when the MP3 decoder was decoding from mono.
B-5901	Minor	Some variables that were in scope were not shown when debugging a VM application. These variables now appear correctly.
B-5906	Minor	The combined headset application now checks its current state before attempting to close the AVRCP connection.
B-5909	Minor	The six functions to set the input and output gains in the <code>codec</code> library, have been replaced by two, where the channel that should be affected is now passed into the function.
B-5910	Minor	<code>CLASS_OF_DEVICE</code> is no longer defined in the <code>spp</code> library. The type named <code>deviceType</code> that was passed into <code>SppInit</code> has been renamed as <code>spp_device_type</code> .
B-5914	Minor	The <code>examples/test_headset</code> application has been removed; it was incomplete and will be replaced by a fully featured headset application in a later BlueLab release.
B-5915	Minor	The SBC and MP3 decoders are now better at correcting byte alignment when re-synchronising.
B-5918	Minor	A debug variant of the <code>avrcp</code> library is now built by default when installing BlueLab.
B-5919	Minor	The combined headset application now sends a button press to the AG if connected as HSP after an HFP connect has failed.
B-5920	Minor	The interface to the <code>goep</code> library has been substantially updated to make it more understandable and more consistent with other BlueLab libraries.
B-5921	Minor	The <code>AvrcpPassthrough</code> and <code>AvrcpVendorDependent</code> interfaces have been changed so that vendor data is passed as a <code>Source</code> and they handle it correctly.
B-5926	Minor	The <code>hfp</code> library API now complies with the BlueLab library coding standard.
B-5934	Minor	<code>spp</code> library code to connect the <code>rfcomm</code> stream to the UART and to operate LEDs has been moved to the application. The connect confirmation status has now been changed from type <code>rfcomm_connect_status</code> to <code>spp_connect_status</code> .
B-5945	Major	The <code>a2dp</code> library now uses <code>kalimba_standard_messages.h</code> for the kalimba message types.
B-5946	Minor	The <code>connection</code> library API now complies with the BlueLab library coding standard.
B-5949	Major	BlueLab now probes over SPI to automatically identify which hardware you are using, both BlueCore variant and flash size. As a result the 'hardware' project property in xIDE has been removed.
B-5955	Minor	BlueLab now includes 'compact' firmware builds that support the read-only filesystem (but not DFU) on 6-Mbit parts. These allow applications to exceed 32Kwords on 6-Mbit parts.

ID	Severity	Description
B-5967	Minor	AV streaming has been improved so that the start of a track will play straight away rather than 200ms being lost. Also the poorlink state is now less likely to be entered and so previous mute periods between audio tracks should not exist any more.
B-5972	Minor	The power table in the <code>gavdp</code> library now uses passive mode.
B-5978	Minor	The firmware now correctly handles overlapping calls to <code>AdcRequest</code> ; previously using the battery library to sample two sources could result in no readings being produced.
B-5988	Minor	The <code>gavdp</code> library no longer panics during <code>A2dpOpen</code> if the signalling channel establishment failed; checks have been added to make sure the signalling channel is valid when looking for a stream endpoint.
B-6029	Minor	<code>MESSAGE_SOURCE_EMPTY</code> has been added.
B-6053	Minor	The interface to the <code>ftpc</code> library has been updated to make it more consistent with other BlueLab libraries.
B-6059	Major	<code>MESSAGE_STREAM_DISCONNECT</code> is now sent to the task associated with the sink; previously it was only sent there if no task was associated with the source.
B-6060	Minor	The <code>gavdp</code> library no longer rejects connections from devices that have their MTU set to less than the L2CAP default MTU (672 bytes). The library will now accept a connection from a remote device advertising any legal MTU.
B-6062	Minor	The combined headset application correctly updates its internal state when notified of an incoming call while currently in an active call.
B-6068	Minor	Debounce settings can now be specified in <code>.button</code> files using <code>debounce samples delay</code> .
B-6071	Minor	Low power table support has been added to the <code>spp</code> library.
B-6073	Minor	The <code>av_headset_hfp</code> application now uses the <code>codec</code> library.
B-6104	Minor	<p>The <code>Connection</code> library manages a list of trusted devices. The list is keyed by Bluetooth address. A new API has been added to allow additional device attributes to be stored.</p> <ul style="list-style-type: none"> <li>- <code>ConnectionSmSetAttribute(..)</code></li> <li>- <code>ConnectionSmGetAttribute(..)</code></li> </ul> <p>This API can be used to store and retrieve attribute data for a device keyed by Bluetooth address.</p>
B-6105	Minor	The default L2CAP configuration in the <code>connection</code> library now sets the local MTU to 895 bytes, the maximum we can support, rather than 672 bytes.
B-6107	Cosmetic	<code>kalasm2</code> no longer prints out random characters instead of meaningful strings as part of some warning and error messages.
B-6110	Major	The <code>gavdp</code> library now correctly updates its internal state if a suspend request is rejected by the remote end. This was causing it to reject subsequent suspend requests from the remote end.
B-6117	Minor	The Kalimba DSP decoder code has been adjusted to eliminate ticks which were sometimes heard at the beginning of a track.
B-6123	Minor	<p>When reading or writing data to a Kalimba DSP port, you can now force different settings, for big/little endian and sign extension, than the defaults. To use different settings from the defaults the port identifiers can now be defined with the following extra definitions:</p> <pre>\$cbuffer.FORCE_BIG_ENDIAN or \$cbuffer.FORCE_LITTLE_ENDIAN</pre> <p>and</p> <pre>\$cbuffer.FORCE_SIGN_EXTEND or \$cbuffer.FORCE_NO_SIGN_EXTEND</pre>
B-6124	Major	The <code>connection</code> library no longer leaks memory when its client attempts to connect to an invalid Bluetooth address.

ID	Severity	Description
B-6129	Minor	The interface to the <code>ftps</code> library has been updated to make it more consistent with other BlueLab libraries.
B-6143	Minor	<code>ConnectionSmDeleteAllAuthDevices(...)</code> previously failed to remove all devices from the paired device list.
B-6152	Minor	A firmware change means that the sink value in <code>DM_EX_SCO_DISCONNECT_IND</code> primitives is now correctly set, rather than being zero.
B-6153	Minor	The <code>av_headset_hfp</code> application now checks stream validity before routing SCO to the PCM hardware.
B-6155	Minor	Freeing a pointer which points into the middle of an allocated region (rather than the start of the region) now causes a VM panic.
B-6163	Minor	If the remote end initiates closing the media channel the <code>gavdp</code> library waits for 500ms (thus allowing the remote end to disconnect the signalling channel) before initiating a disconnect of the signalling channel, if it is still connected. Previously it would disconnect the signalling channel immediately.
B-6165	Minor	The <code>a2dp</code> and <code>gavdp</code> libraries now provide a <code>CloseAll</code> function to clean up all existing AV connections.
B-6177	Minor	The <code>gavdp</code> library no longer tries to use a signalling connection that doesn't exist.
B-6178	Minor	The <code>gavdp</code> library now does some additional checking on the result of a <code>SinkClaim</code> .
B-6179	Minor	The <code>oppc</code> library API has been updated as part of the changes to the <code>goep</code> API.
B-6188	Minor	Code has been added to prevent changing track, or playing of very short sound clips, resulting in a short clip of the last sound being played.
B-6194	Minor	If the AG does not support an in-band ring tone but opens a SCO while sending RING indications, the combined headset application will now play its own ring tone.
B-6198	Minor	A new 'Message' tab in xIDE traces messages passed to the tasks in the application, both from other tasks and from the firmware.
B-6208	Minor	The <code>a2dp</code> and <code>gavdp</code> no longer contain a <code>media_sink</code> field in their CODEC settings indication messages.
B-6210	Minor	The <code>opps</code> API has been updated to match the new <code>goep</code> API.
B-6214	Minor	An <code>opp_server</code> application has been added.
B-6217	Minor	A minor issue in the firmware has been resolved which could mean updates to local variables placed at <code>0xFFFF8</code> were ignored by xIDE.
B-6230	Minor	<code>SinkIsValid</code> and <code>SourceIsValid</code> library routines have been added.
B-6233	Minor	A debug variant of the <code>spp</code> library is now built by default when installing BlueLab.
B-6234	Minor	The <code>opps</code> library no longer assumes that vCard mime types will all be lower case.
B-6245	Minor	The <code>hfp</code> library now correctly hangs up the active call if a second call comes in and the application issues an <code>HfpTerminateCall</code> request.
B-6259	Minor	<code>gcc</code> no longer allows bitfields to straddle word boundaries any more. Doing so generated extra code and broke applications which made assumptions about structure packing.
B-6275	Minor	An <code>obex_server</code> application has been added.
B-6276	Fatal	The <code>gavdp</code> library now correctly validates the service capabilities received in a get capabilities response.
B-6283	Minor	The <code>examples/oppc</code> application has been added.
B-6284	Minor	DFU tools have been included with BlueLab in <code>tools/dfu</code> .
B-6286	Minor	The AG may optionally include an alphanumeric representation of the number sent in the CLIP indication. If the <code>hfp</code> receives this it sends a single <code>HFP_CALLER_ID_NAME_IND</code> message to the client containing this string.
B-6287	Minor	The Kalimba DSP message library has been updated to avoid corrupting the timer list when the firmware took longer than expected to acknowledge a message.

ID	Severity	Description
B-6330	Minor	Any streams connected to the Kalimba DSP are now disconnected before a new Kalimba DSP application is loaded by <code>KalimbaLoad</code> ; previously the firmware could believe that streams were still connected, despite the Kalimba DSP having been restarted.
B-6347	Minor	A warping operator has been added to the Kalimba DSP libraries allowing <code>stream_decode</code> to maintain buffer levels at the good working level. This supports source and sink having non perfect sampling frequencies and helps to conceals flaws in encoders with poor buffer-level jitter control.
B-6375	Minor	The <code>connection</code> library now waits for the client to read the <code>CL_L2CAP_DISCONNECT_IND</code> message before acknowledging the disconnect.
B-6380	Minor	<code>PcmRateAndRoute</code> to internal CODECs on kalimba will now rejects 48kHz for the ADCs since it is not supported by the hardware.
B-6386	Minor	The <code>hfp</code> and <code>a2dp</code> libraries now allow their client task to supply a service record to be registered instead of the default service record for that profile.
B-6417	Minor	The <code>hfp</code> library now returns more specific error codes if the SLC attempt fails so its client can differentiate between a connect fail due to page timeout and the remote device not supporting the requested service.
B-6439	Minor	A <code>connection_id</code> field has been added to the <code>CL_L2CAP_CONNECT_CFM</code> message sent by the <code>connection</code> library.
B-6447	Minor	The Kalimba DSP profiler library no longer requires explicit calls to <code>profiler.register</code> before the first call to <code>profiler.start</code> .
B-6448	Minor	To be more consistent with other Kalimba DSP libraries the names of some constants have been changed. For example: <code>\$codec.STREAM_ENCODER_IN_LEFT_BUFFER_FIELD</code> has been changed to: <code>\$codec.stream_encode.IN_LEFT_BUFFER_FIELD</code>
B-6451	Major	The Kalimba DSP loop registers are now reset during <code>KalimbaLoad</code> ; previously they were left alone. If, as a result of switching Kalimba DSP applications, this left them pointing to the first instruction in a loop, the Kalimba DSP could branch to a random address.
B-6483	Minor	The structures used to configure the profile library instance for the <code>hfp</code> and <code>a2dp</code> libraries have been renamed to <code>hfp_init_params</code> and <code>a2dp_init_params</code> respectively.
B-6503	Minor	The <code>hfp</code> library now ignores RING indications if the AG sends them before the SLC is fully established. Both ends are forbidden (by the profiles) from sending any signalling messages until the SLC has completed.
B-6505	Minor	Scripts to help Matlab users to inspect Kalimba DSP state (such as buffer levels) have been added to the <code>tools/matlab</code> directory.
B-6510	Minor	A subtle bug in the gcc register allocator caused gcc to delete an instruction that was necessary in some obscure circumstances.
B-6555	Minor	Improved interop of Bluestack by always exiting sniff mode or park mode before opening a SCO or eSCO link. It was seen that certain phones would always reject a SCO connection if the ACL was in sniff.
B-6597	Minor	The firmware implementation of <code>StreamConnectDispose</code> has been optimised when applied to common case of region, file and audio sources.
B-6598	Minor	The <code>av_headset_hfp</code> application no longer attempts to configure the ADC to a rate the hardware does not support.
B-6601	Minor	When connecting an Audio Source to the Kalimba DSP, garbage data was occasionally sent. This has been fixed.
B-6631	Minor	At above maximum amplitude saturation now correctly occurs.

ID	Severity	Description
B-6641	Major	The MPEG-2 extended sample rates have been removed from the MP3 capabilities in the <code>a2dp</code> library because these are not supported by the Kalimba DSP application.
B-6694	Major	Calls to <code>StreamConnect</code> with a SCO stream no longer fail if the SCO connection is in the process of being closed by the baseband but the VM application has yet to be informed.
B-6699	Minor	A memory leak when connecting to an invalid Bluetooth address has been fixed in the <code>goep</code> library.
B-6901	Fatal	BlueFlash and BlueFlashCmd no longer report errors writing to sector 64 on BlueCore 3 when using certain flash devices.
B-6906	Fatal	The version of <code>strncpy</code> supplied as part of the BlueLab libraries could illegally access memory beyond the bound given on the source string. This has been fixed.
B-6941	Major	xIDE no longer reports nonsense values for the contents of a service record when logging a <code>SDS_REGISTER_REQ</code> in the BlueStack tab. (In unusual circumstance the firmware could panic while logging such a primitive.)
B-6980	Major	The AVRCP library now leaves data in the source until a response has been sent; previously it would hold the data in a dynamic block which caused problems with stacks (such as the iPaq HX2415) which sent multiple AVRCP messages without waiting for an acknowledgement.
B-6983	Major	A problem has been resolved which could, in unusual circumstances, lead to <code>gcc3</code> generating incorrect code when switching on a variable and then referencing the variable soon after the switch.
B-6996	Minor	The <code>spp_dev_a</code> application no longer looks for an exact class of device match during an inquiry result.
B-7203	Major	If the connection library receives an L2CAP connect response and cannot find the internally stored data for this connection it will now send a <code>CL_L2CAP_CONNECT_CFM</code> message to the client indicating this rather than panicking.
B-7217	Major	The <code>hfp</code> library now allows audio transfer when in the incoming and outgoing call states.
B-7246	Minor	Reference documentation for the Kalimba DSP library code is now included and accessible from xIDE's help panel.
B-7265	Minor	The CVSD filter is now available when using SCO streams.
B-7319	Major	The <code>gavdp</code> library could fail to attempt a role switch even when the device was configured as an AV sink. This could result in degraded throughput and poor AV performance and has been fixed.
B-7360	Minor	The <code>hfp</code> no longer leaks memory when an <code>HfpSbcConnect()</code> is issued with the <code>extra_indicators</code> parameter set and the connect attempt fails.
B-7370	Minor	The <code>hfp</code> library has been updated to use a longer sniff interval.
B-7386	Minor	The <code>gavdp</code> library now cleans up its state properly if it attempts to open a transport channel and this attempt fails.
B-7388	Major	The <code>av</code> source dongle application now correctly handles an <code>A2DP_CODEC_SETTINGS_IND</code> message from the <code>a2dp</code> library if the remote device is initiating the AV connection. Previously it was not expecting that message in that state and would panic.
B-7402	Minor	The <code>hfp</code> library now correctly parses +CCWA indications sent from the AG with fewer parameters than required by the HFP specification.
B-7405	Minor	The <code>avrmp</code> library has been updated so it can be configured to support either the target or the controller role. The correct UUID is inserted into the service record registered by the <code>avrmp</code> library depending on the role selected by the client.
B-7433	Minor	This release of firmware adds support for slave mode I2S audio.
B-7439	Minor	Explicit support for MBM29SL800BE was missing from BlueFlash and BlueFlashCmd. It has been added.

ID	Severity	Description
B-7638	Minor	A demonstration version of the CVC DSP code has been added to the <code>av_headset_hfp</code> application (this can be enabled by defining <code>INCLUDE_CVC</code> in the project properties.)
B-7693	Major	The <code>EnergyEstimationOn/Off</code> functions no longer fail if the SCO sink is connected to a source.
KEX-20	Minor	A spurious read has been eliminated from the gargle filter. This caused the audio to sound gargled even when the filter was off.
KEX-23	Minor	A tone generation example has been added, making use of the Kalimba DSP to generate the tones, and the VM to parse instructions typed by the user into an interface such as HyperTerminal.
KEX-28	Minor	BlueLab3.2 kalimba examples have been updated to align with the current naming convention. To that end modules are now named using the following convention: <code>\$M.modName</code> not <code>\$M_modName</code> .
KEX-29	Minor	A demonstration of the mix operator has been added to the <code>test_sbc_loopback</code> example in BlueLab.
M-399	Minor	Kalimba breakpoints are no longer lost when the Kalimba application is reloaded by the vm.
M-412	Minor	Debug output in xIDE is no longer slower with the BlueCore host transport set to none, and in general performance and robustness of the SPI transport has been improved.
M-427	Cosmetic	The debug transport for xIDE can no longer be 'unset' by dismissing the debug transport dialog without making a selection; which could prevent the debugger making contact with BlueCore.
M-442	Minor	The accuracy of timestamps in the xIDE primitive trace has been improved.
M-571	Minor	If the pre-processor symbols used in a Kalimba DSP project are changed, xIDE will now force a rebuild of the assembler source code. Previously, a manual 'clean' step was required to force this to happen.
M-577	Cosmetic	The version of BlueLab being used is now displayed in the title bar of the main xIDE window.
M-595	Major	Expanding certain items in the variable widget (especially pointers) could cause xIDE to crash. This no longer occurs.
M-596	Minor	xIDE can now parse debug information for code with variables declared as <code>'volatile'</code> .
M-599	Minor	Certain variables were displayed as <code>????</code> in the xIDE debugger. These variables are now read correctly.
M-690	Major	xIDE should now correctly handle setting breakpoints in Kalimba DSP source files. Previously it could refuse to set them if the file was opened from the File menu, rather than from the project file list.

**Table F.1: Issues Resolved in BlueLab v3.2**

## Appendix G Issues Resolved in BlueLab v3.1

The following issues were fixed in the BlueLab v3.1 release.

ID	Severity	Description
B-1730	Minor	The <code>strcmp</code> and <code>memcmp</code> functions in the C library now correctly use unsigned char according to the C standard, rather than plain char.
B-3997	Minor	<code>ConnectionReadRemoteName</code> has been implemented in the connection library. (It truncates names longer than 31 characters.)
B-4158	Minor	The (unused) <code>a2dp_discover</code> call has been removed from the <code>a2dp</code> library.
B-4335	Major	The <code>hfp</code> profile library will silently ignore any <code>AT+VGS</code> commands which come in faster than they can be handled. This is to avoid memory exhaustion.
B-4379	Minor	Server side functionality has been added to the <code>GOEP</code> library.
B-4404	Minor	The <code>av_headset</code> and <code>av_headset_hfp</code> applications now attempt to close down the AV connection gracefully when powered down.
B-4658	Minor	The <code>avrcp</code> library now provides a power table to the <code>connection</code> library. It uses the priority passed to <code>AvrcpInit</code> by the application.
B-4677	Major	An issue in the <code>av_headset_hfp</code> application where audio playback would not resume after the Source initiated an <code>AVDTP_SUSPEND</code> followed by <code>AVDTP_START</code> has been resolved.
B-4760	Minor	<code>kalimba_standard_messages.h</code> header has been added listing various messages passed between the Kalimba DSP code and the supplied VM applications.
B-4769	Fatal	Messaging from the Kalimba DSP to the VM application does not work with the firmware shipped with BlueLab 3.0-release. This has been resolved in subsequent firmware builds.
B-4771	Fatal	<code>gcc3</code> has been updated to prevent it from generating incorrect assembler code for shifts in certain code fragments.
B-4811	Fatal	<code>kalasm2</code> no longer writes truncated <code>.klib</code> files on certain source files.
B-4813	Cosmetic	<code>xIDE</code> no longer displays the (unused) <code>BH</code> and <code>BL</code> registers which were needed for <code>gcc2</code> .
B-4841	Minor	The <code>goep</code> and <code>ftpc</code> libraries have been extended to enable use of the optional type header.
B-4848	Major	Selection and loading of the Kalimba CODEC has been moved into the <code>a2dp</code> library (previously it was performed by the client applications.)
B-4849	Major	The <code>a2dp</code> library now performs capability negotiation for the CODECs and notifies the application of the result.
B-4895	Minor	The <code>a2dp</code> and <code>gavdp</code> libraries now refers internally to the AV stream using sinks rather than the SEID. The SEID is still passed up to the application for informational purposes.
B-4916	Major	The <code>a2dp</code> library now handles SEP registration. The application only needs to specify the type(s) ( <code>SBC</code> , <code>MP3</code> , ...) of SEP they wish to register.
B-4918	Minor	The <code>a2dp_source_dongle</code> application can now be built so that it accepts an analogue input using the new <code>codec</code> library, or enumerates as USB speakers.
B-4973	Minor	A generic <code>codec</code> library for <code>BleCore3</code> Multimedia has been added which currently supports both the internal CODECs and an external <code>Wolfson WM8731</code> .
B-5005	Minor	The <code>connection</code> library now informs clients that an ACL connection has been opened by sending <code>CL_DM_ACL_OPENED_IND</code> .
B-5008	Minor	The debug variant of the <code>connection</code> library now checks the status field of primitives it would otherwise ignore and panics if the status field is bad.
B-5010	Minor	Support for changing the local name has been added to the <code>connection</code> library.



ID	Severity	Description
B-5039	Minor	The <code>GOEP</code> library now sends an explicit delete request to its application when a remote client wishes to delete an object.
B-5059	Major	The <code>hfp</code> library now unconditionally sends volume indications to the client when in headset mode. Previously it incorrectly checked the local supported features but those are relevant only to the hands-free profile.
B-5069	Minor	Firmware for BlueCore4-external is now included with BlueLab.
B-5084	Major	A possible infinite loop in <code>gavdpHandleTransportChannelClosed</code> in the <code>gavdp</code> library has been eliminated.
B-5098	Minor	The <code>gavdp</code> library no longer relies on a (30 second) timeout to detect failed connections.
B-5111	Minor	A <code>FileParent</code> function has been added to find the directory containing an item in the read-only file system.
B-5120	Minor	The <code>buttonparse</code> tool has been extended to allow the creation of messages for double key presses.
B-5131	Minor	The <code>gavdp</code> library now returns an error message to the client if <code>GavdpClose</code> is attempted while in the wrong state. The close operation itself is not attempted.
B-5138	Major	The <code>hfp</code> library now correctly frees the memory containing the results of an SDP search.
B-5171	Major	The <code>spp</code> and <code>goep</code> libraries now correctly free the memory containing the results of an SDP search.
B-5181	Minor	The <code>TGAVDP100</code> timeout in the <code>gavdp</code> library has been increased to avoid signalling timeouts in cases where the packets are delayed due to heavy Bluetooth usage such as a scatternet with both a SCO connection and AV streaming.
B-5188	Minor	The <code>test_headset</code> application now correctly sets up <code>PSKEY_FIXED_PIN</code> .
B-5192	Minor	The <code>PcmRate</code> and <code>PcmRoute</code> calls are deprecated; the supplied example applications now use the combined <code>PcmRateAndRoute</code> call.
B-5193	Minor	The <code>test_headset</code> application now tries to use the internal CODEC and, if that doesn't exist, an external CODEC. As a result it will work on BlueCore variants with internal and external CODECs.
B-5194	Minor	Both <code>av_headset</code> and <code>av_headset_hfp</code> now panic if an attempt to register an SEP fails during startup. Previously they would just fail mysteriously if, say, the required Kalimba DSP application was not present on-chip.
B-5253	Fatal	<code>gcc3</code> has been updated to eliminate a possible fatal failure during the reload phase of a <code>'movhi'</code> instruction.
B-5297	Major	The linker <code>'ld'</code> has been updated to eliminate warnings and a possibly incorrect <code>stackusage</code> calculation for programs containing very large call instructions.
B-5409	Minor	New <code>StreamConnectAndDispose</code> function added.
M-387	Major	<code>xIDE</code> should now correctly display the source code for <code>kalimba</code> libraries.
M-530	Minor	<code>PSKEY_VM_DISABLE</code> can no longer be accidentally left set to 2 (debug) if <code>xIDE</code> terminates abnormally; the VM will be left in the state it was before debugging.

Table G.1: Issues Resolved in BlueLab v3.1

## Terms and Definitions

ADC	Analogue to Digital Converter (the analogue inputs on BlueCore)
AG	Audio Gateway
AT	Attention (modem command prefix)
API	Application Programming Interface
AVRCP	Audio/Video Remote Control Profile
BCCMD	BlueCore Command
BCSP	BlueCore Serial Protocol
BlueCore™	Group term for CSR's range of Bluetooth wireless technology chips
BlueLab™	CSR's development toolset for building applications to run in the firmware's VM
Bluetooth®	Set of technologies providing audio and data transfer over short-range radio connections
BlueStack™	Mezoe's implementation of a Bluetooth protocol stack (up to RFCOMM level)
BlueSuite™	Family of software utilities for Bluetooth evaluation and development (supplied with CSR development systems Casira, MicroSira, CompactSira).
Casira™	CSR's main Bluetooth evaluation hardware
CODEC	COder DECoder
CPU	Central Processing Unit
CSR	Cambridge Silicon Radio
cVc	Clear Voice3 Capture
DM	Device Manager
DTMF	Dual Tone Multi-frequency
DSP	Digital Signal Processor
EAG	Embedded Audio Gateway
FTPC	File Transport Profile Client
FTPS	File Transport Profile Server
GAVDP	Generic Audio/Video Distribution Profile
GCC	GNU Compiler Collection
GOEP	Generic Object Exchange Profile
H4	UART-based HCI transport, described in section of H4of v1.0b of Bluetooth Specification
HCI	Host Controller Interface
HFP	Handsfree Profile
HID	Human Interface Device
OBEX	Object EXchange Protocol
OPPC	Object Push Protocol Client
OPPS	Object Push Protocol Server
PABP	Phonebook Access Profile
Persistent Store	Storage of BlueCore's configuration values in non-volatile memory
PIO	Parallel Input Output; the parallel port on BlueCore
PM	Program Memory
RAM	Random Access Memory
RFCOMM	Serial cable emulation protocol (element of Bluetooth)
SBC	Sub-Band Coding
SCO	Synchronous Connection Oriented link
SDK	Software Development Kit

SDP	Service Discovery Protocol
SLC	Subscriber Loop Carrier
SIG	Special Interest Group (Bluetooth SIG controls the Bluetooth specifications)
SPI	Serial Peripheral Interface
SPP	Serial Port Profile
TCP	Transmission Control Protocol
UART	Universal Asynchronous Receiver Transmitter
UDP	User Datagram Protocol
USB	Universal Serial Bus
VM	Virtual Machine; environment in the BlueCore firmware for running application-specific code produced with BlueLab
xIDE	BlueLab's Integrated Development Environment

## Document History

Revision	Date	Reason for Change
ISSUE 1	05 DEC 06	Original publication of this document. (CSR reference: CS-110737-RNP1)

# BlueLab

## BlueLab v3.6 Software Release Note

**CS-110737-RNP1**

**December 2006**

Unless otherwise stated, words and logos marked with <sup>™</sup> or <sup>®</sup> are trademarks registered or owned by Cambridge Silicon Radio Limited or its affiliates. Bluetooth<sup>®</sup> and the Bluetooth logos are trademarks owned by Bluetooth SIG, Inc. and licensed to CSR. Other products, services and names used in this document may have been trademarked by their respective owners.

The publication of this information does not imply that any license is granted under any patent or other rights owned by Cambridge Silicon Radio Limited.

CSR reserves the right to make technical changes to its products as part of its development programme.

While every care has been taken to ensure the accuracy of the contents of this document, CSR cannot accept responsibility for any errors.

CSR's products are not authorised for use in life-support or safety-critical applications.