

## VisualDSP++ 4.0 (Updated September 2006) Release Note

The following release note concerns the September 2006 Update to the VisualDSP++ 4.5 release. This release is inclusive of previous Updates. The contents of future Updates will be inclusive of all previous Updates. The release notes for past Updates are appended to the end of this release note.

### Identifying Which Update Is Currently Installed on Your System

The Update level is identified in three places:

1. The Add/Remove Programs Control Panel entry for VisualDSP++ 4.5.
2. The VisualDSP++ GUI's About box, located at "Help" > "About VisualDSP++".
3. In the file `...\System\VisualDSP.ini`, in the `ProductName` key.

### Installing an Update

The procedure for installing an Update to VisualDSP++ is described below. Note that with VisualDSP++'s support for installing multiple instances of itself, it is possible to "trial" an Update in a new directory before switching over your "golden" tools installation to the Update.

1. Use the Start Menu to navigate to VisualDSP++'s "Maintain this Installation" item.
2. Select "Go to the Analog Devices website" and click "Next". This will launch your web browser and navigate it to the proper URL to download Updates from.
3. Download the VisualDSP++ Update file (.VDU) of interest to your hard disk. Note that these files have a .VDU file extension and cannot be executed directly.
4. Navigate to "Maintain this Installation" again. If you have multiple installations of VisualDSP++ on your computer, be doubly sure you are navigating to the installation you wish to Update.
5. Select "Apply a downloaded Update" and click "Next". Click the "... " browser button and navigate to the .VDU file that you downloaded in step 3. Click "OK", then "Next".
6. Follow the on-screen prompts to complete the installation of the Update.

### Significant Additions

The primary purpose of VisualDSP++ Updates is to address problems and stabilize the release. Significant new functionality is not expected to be introduced in an Update. However, incremental support (i.e., emulation, example programs, header files, default LDF, errata accommodations, EZ-KIT Lite software, etc.) for new semiconductor products will be added as these products become available and gain support within the VisualDSP++ tools.

In this release:

1. Software support for the ADSP-BF538F EZ-KIT Lite has been added. This includes debug connectivity via the on-board USB debug agent, the flash programmer (both GUI support and underlying drivers), and LwIP (Ethernet) drivers. Flash drivers are provided for both the on-chip flash found on the ADSP-BF538F and the off-chip flash device on the EZ-KIT Lite. The on-line help system has been updated to include this product.
2. The System Service Library (SSL) has been enhanced to support ADSP-BF538 Blackfin processor. Included in this Update is support for the EBIU, Dynamic Power Management, DMA, Interrupt, Deferred Callback, Timer, Flag and Port Control system services for the ADSP-BF538 processor. The default LDFs have been updated to link against SSL.
3. Blackfin device drivers have been updated. The `adi_ad1836a_ii` and `adi_ad1938_ii` codec drivers now support automatic SPORT configuration. PPI, UART, SPI, TWI and SPORT device drivers for the ADSP-BF538 processor have been introduced.

4. Software support for the ADSP-21375 EZ-KIT Lite has been added. This includes debug connectivity via the on-board USB debug agent, and well as flash programmer GUI support and underlying drivers. Execution from external memory is now supported in simulator, emulator, and EZ-KIT Lite debugging sessions. The on-line help system has been updated to include this product.

## **Changes to Existing Behaviors, Projects, and Source Code**

When addressing problems, we attempt to make any changes backward compatible with existing projects. However, depending on the nature of a problem, compatibility issues are sometimes unavoidable. This section highlights any changes in the Update that may require the modification of “working” projects or otherwise influence existing behavior.

In this release:

1. Within the Blackfin DMA Manager’s include file, `adi_dma.h`, an additional field named `CallbackFlag` has been added to the data structures that describe large and small model descriptors, `ADI_DMA_DESCRIPTOR_LARGE` and `ADI_DMA_DESCRIPTOR_SMALL` respectively. This field should be set to `TRUE`, if a callback is requested after the descriptor has been processed or `FALSE` if no callback is requested after the descriptor has been processed. Previously, the `DI_EN` bit within the configuration register of the descriptor was used to trigger a callback.

This change affects only user code that explicitly calls the `adi_dma_Queue()` function.

2. Source code files that make calls into the System Services (code that includes the file “`services.h`”) should be rebuilt after installation of this update.

## Problems Addressed

The following table is a list of the problems addressed in this Update. Details on any particular problem can be found on the Tools Anomaly web page. Note that after the Issues headings in the top half of the Tools Anomaly web page, problems are detailed in numeric order. The URL is:

<http://www.analog.com/processors/technicalSupport/toolsAnomalies.html>

| Processor Family | Problem Number | Tool               | Description                                                      |
|------------------|----------------|--------------------|------------------------------------------------------------------|
| All              | 28661          | Install            | FYI Norton Internet Security prevents installation               |
| All              | 28799          | Run Time Libraries | fread may signal EOF prematurely                                 |
| All              | 28849          | Compiler           | Compiler driver+LDF requires dummy.c file                        |
| All              | 28895          | Run Time Libraries | C++ runtime support for alternative heaps fails to link (li1021) |
| All              | 28948          | Compiler           | loop pragmas don't work on C++ loops with embedded declarations  |
| All              | 29012          | VDK                | VDK kThreadSwitched history events don't call UserHistoryLog     |
| All              | 29090          | IDDE               | -g is added when convert project from 4.0 to 4.5 with -g>0 in th |
| All              | 29378          | VDK                | Incorrect behaviour following VDK timequeue wraparound           |
| Blackfin         | 25362          | Emulator           | Emulator returns unknown family when targeting BF534 rev 0.2     |
| Blackfin         | 26646          | CRTGen             | Rev 1.7 BF533 EZ-Kit not properly supported in generated CRT     |
| Blackfin         | 28335          | Simulator          | C++ exceptions cannot be used on single core BF561 simulator     |
| Blackfin         | 28339          | Simulator          | Simulator not updating registers correctly                       |
| Blackfin         | 28595          | IDDE               | Additional include directories not always added to command line  |
| Blackfin         | 28764          | System Services    | 1836A_ii codec device driver fails in TDM mode                   |
| Blackfin         | 28819          | IDDE               | Adding file to project with user defined config cause error      |
| Blackfin         | 28823          | Compiler           | 3-byte structs returned from functions incorrectly when -O used  |
| Blackfin         | 28839          | IDDE               | impossible sclk value in Project wizard                          |
| Blackfin         | 28875          | Run Time Libraries | Typo in cdefBF532.h - voidl instead of void                      |
| Blackfin         | 28967          | Configurator       | configurator doesn't handle more than 11 devices properly        |
| Blackfin         | 29025          | VDK                | The placement of TMK and VDK libraries can cause link errors     |
| Blackfin         | 29072          | IDDE               | Blackfin processors not listed in EL Global Properties dialog    |
| Blackfin         | 29177          | Run Time Libraries | SIC_IMASK set with bad bit before DMA transfer (meminit)         |
| Blackfin         | 29231          | Loader             | BF533 rev 0.5 loader files add a zero byte for each data byte    |
| SHARC            | 28857          | Emulator           | primes for 21061 does not run                                    |
| SHARC            | 28882          | Run Time Libraries | SIMD libdsp function vecdotf() might fail                        |
| TigerSHARC       | 28720          | Compiler           | TigerSHARC wrapper generation/regs_clobbered not saving K conds  |
| TigerSHARC       | 28736          | Splitter           | The splitter counts one more byte per word in .stk format        |
| TigerSHARC       | 28752          | Run Time Libraries | TigerSHARC fread can incorrectly return 0 in byte-address mode   |
| TigerSHARC       | 28907          | VDK                | TIMER0H register not set when Timer interrupt is set to None     |

|            |       |           |                                                            |
|------------|-------|-----------|------------------------------------------------------------|
| TigerSHARC | 29032 | IDDE      | Can't load Annotations                                     |
| TigerSHARC | 29043 | Assembler | invalid warning about mult instruction option              |
| TigerSHARC | 29227 | VDK       | VDK API level check can cause false positive Kernel Panics |

## VisualDSP++ 4.5 (Updated July 2006) Release Note

The following release note concerns the July 2006 Update to the VisualDSP++ 4.5 release. This is the first in what is anticipated to be a series of Updates. The contents of future product Updates will be inclusive of all previous Updates. At that time, the release notes for past Updates will be appended to the end of the current release note.

### Identifying Which Update Is Currently Installed on Your System

The Update level is identified in three places:

1. The Add/Remove Programs Control Panel entry for VisualDSP++ 4.5.
2. The VisualDSP++ GUI's About box, located at "Help" > "About VisualDSP++".
3. In the file ...\\System\\VisualDSP.ini, in the ProductName key.

### Installing an Update

The procedure for installing an Update to VisualDSP++ is described below. Note that with VisualDSP++'s support for installing multiple instances of itself, it is possible to "trial" an Update in a new directory before switching over your "golden" tools installation to the Update.

1. Use the Start Menu to navigate to VisualDSP++'s "Maintain this Installation" item.
2. Select "Go to the Analog Devices website" and click "Next". This will launch your web browser and navigate it to the proper URL to download Updates from.
3. Download the VisualDSP++ Update file (.VDU) of interest to your hard disk. Note that these files have a .VDU file extension and cannot be executed directly.
4. Navigate to "Maintain this Installation" again. If you have multiple installations of VisualDSP++ on your computer, be doubly sure you are navigating to the installation you wish to Update.
5. Select "Apply a downloaded Update" and click "Next". Click the "... " browser button and navigate to the .VDU file that you downloaded in step 3. Click "OK", then "Next".
6. Follow the on-screen prompts to complete the installation of the Update.

### Significant Additions

The primary purpose of VisualDSP++ Updates is to address problems and stabilize the release. Significant new functionality is not expected to be introduced in an Update. However, incremental support (i.e., emulation, example programs, header files, default LDF, errata accommodations, EZ-KIT Lite software, etc.) for new semiconductor products will be added as these products become available and gain support within the VisualDSP++ tools.

In this release:

1. The Blackfin compiler, runtime, VDK, and SSL libraries include new workarounds for hardware anomalies 05-00-0189 and 05-00-0283. The compiler will automatically enable these workarounds when building for parts and silicon revisions that require them. Alternatively they can be enabled using the `-workaround` switch.

05-00-0283 –

One part of the workaround is to include a code sequence in all event handlers. The sequence makes a mispredicted jump over a dummy MMR read. This must be done before any `SSYNCS` in the handler. This sequence is generated by the compiler for C/C++ based event handlers that use `#pragma interrupt` or `sys/exception.h` defined macros such as `EX_INTERRUPT_HANDLER`. The two handlers affected in the

runtime libraries are `_cplb_hdr` and the interrupt dispatcher `_despint` which have been modified to include the workaround.

The second part of the workaround is to avoid system MMR writes in the two instructions after a not-predicted conditional jump. The compiler will insert `nop` instructions to avoid this when it identifies the problem sequence.

These workarounds can be enabled using the `-workaround stalled-mmr-write-283` switch. When the workaround is enabled the macro `__WORKAROUND_STALLED_MMR_WRITE_283` is defined at compile, assemble and link stages

05-00-0198 –

A workaround for this anomaly was already available in the compiler. However the conditions which cause anomaly have changed to include a new code sequence. The compiler has been modified to identify this new sequence. The anomaly may occur where MMR reads or writes occur immediately after a stalled memory read. The compiler will avoid such code being generated for C/C++ compiled code. The runtime libraries are safe against this anomaly.

This workaround can be enabled using the `-workaround sdram-mmr-read` switch. When the workaround is enabled the macro `__WORKAROUND_SDRAM_MMR_READ` is defined at compile, assemble and link stages.

2. There has been a change of compiler behavior relating to MMR (Memory Mapped Register) accesses and volatile variables. The new switch `-no-assume-vols-are-mmrs` has been added.

There are various MMR related hardware errata that the compiler supports workarounds for; 05-00-0122, 05-00-0157, 05-00-0198, 05-00-0283. Previously the compiler would only implement these workaround for accesses that it could absolutely determine were to MMRs. This in practice meant that only literal MMR addresses accesses could be determined accurately. More complex accesses, for example using addresses stored in variables, might not be identifiable as MMR accesses and could therefore result in the various anomalies being hit.

The compiler has been modified to try and avoid missing these more complex MMR accesses. If there is an access to a variable that is defined as `volatile`, and the compiler cannot determine that the access is not to an MMR, the compiler will now assume it is an access to an MMR unless the new switch `-no-assume-vols-are-mmrs` is used.

## Changes to Existing Behaviors, Projects, and Source Code

When addressing problems, we attempt to make any changes backward compatible with existing projects. However, depending on the nature of a problem, compatibility issues are sometimes unavoidable. This section highlights any changes in the Update that may require the modification of “working” projects or otherwise influence existing behavior.

In this release no changes have been identified.

## Problems Addressed

The following table is a list of the problems addressed in this Update. Details on any particular problem can be found on the Tools Anomaly web page. The URL is:

<http://www.analog.com/processors/cda/epTASearch>

| Processor Family | Reference Number | Tool               | Description                                                      |
|------------------|------------------|--------------------|------------------------------------------------------------------|
| All              | 28180            | Compiler           | modena test c0527101 fails byte addressing when compiled -eh     |
| All              | 28225            | Compiler           | C++ exceptions thrown from inline virtual functions may fail     |
| All              | 28244            | VDK                | Issue with dynamically created VDK components at startup         |
| All              | 28271            | Run Time Libraries | Increase in code size for printf                                 |
| All              | 28341            | Run Time Libraries | attributes missing in libx dojs                                  |
| All              | 28399            | Compiler           | static C++ classes can cause bad debug                           |
| All              | 28876            | Assembler          | Cannot perform source-level debug of assembly source files       |
| All              | 28929            | Emulator           | USB-ICE inoperable when updating to 4.5 while connected          |
| All              | 28935            | VDK                | User's timer interrupt settings can be overwritten               |
| All              | 29140            | Emulator           | RoHS USB-ICE does not work with base 4.5 install                 |
| Blackfin         | 28043            | Loader             | Loader supports different default Rev #s from what it should.    |
| Blackfin         | 28229            | IDDE               | Annotations left in source pane after they are turned off        |
| Blackfin         | 28287            | Loader             | Zero padding to booting stream                                   |
| Blackfin         | 28297            | Compiler           | Compiler internal error (macdefs.c:1162) with -O                 |
| Blackfin         | 28305            | Run Time Libraries | ftell() with -full-io in text mode can return incorrect position |
| Blackfin         | 28309            | Compiler           | Non-interrupt safe prologue code generated for BF535             |
| Blackfin         | 28338            | Compiler           | INTERNAL COMPILER ERROR: No switch note found                    |
| Blackfin         | 28383            | Assembler          | .inc/binary produces corrupted doj                               |
| Blackfin         | 28410            | Run Time Libraries | Cache flushing on BF535 and wireless parts doesn't work          |
| Blackfin         | 28445            | IDDE               | If I add cplbtable and then disable cache project does not link  |
| Blackfin         | 28450            | IDDE               | configurator screen not coming to front                          |
| Blackfin         | 28467            | IDDE               | errors and other issues removing configurations                  |
| Blackfin         | 28472            | Run Time Libraries | Possibility of erroneous result computed by fir_decima_fr16()    |
| Blackfin         | 28487            | Run Time Libraries | Wrong comment in the source of the radix2 FFT library functions  |
| Blackfin         | 28497            | Run Time Libraries | Incorrect macro in defBF534.h and defBF538.h                     |
| Blackfin         | 28517            | LDFGen             | Possible link error with generated BF561 LDF and mem init        |
| Blackfin         | 28521            | LDF                | OTHERCORE not implemented correctly in default multi-core LDFs   |
| Blackfin         | 28588            | Compiler           | bad compare of unsigned short and unsigned literals -O           |
| Blackfin         | 28600            | Loader             | Loader does not work with Rev 0.3 for 539.                       |
| Blackfin         | 28679            | Loader             | Remove the ignore block from loader files.                       |
| Blackfin         | 28686            | LDFGen             | Single core generated LDF uses \$OBJECTS before definition       |
| Blackfin         | 28688            | Run Time Libraries | Instance of speed path anomaly 05-00-0209 in cache flush func    |
| Blackfin         | 28689            | LDFGen             | LDFGen does not always use the correct CPLB table                |
| Blackfin         | 28710            | Loader             | Loader need to support Rev. 0.5 for 531/2/3                      |
| Blackfin         | 28765            | IDDE               | project not restored after starting connection-less IDDE         |
| Blackfin         | 28779            | Run Time           | defbf534.h has incorrect PFDE_UART macro definitions             |

|            |       |                    |                                                                  |
|------------|-------|--------------------|------------------------------------------------------------------|
|            |       | Libraries          |                                                                  |
| Blackfin   | 28994 | VDK                | Potential for excessive stack usage on Blackfin processors       |
| SHARC      | 28283 | LDF                | The section "seg_int_code" has grown unnecessarily               |
| SHARC      | 28569 | VDK                | Sharc li2152 link warnings when using earlier Si Revision        |
| SHARC      | 28692 | Run Time Libraries | 0.0 2126x libraries built with an inappropriate silicon revision |
| SHARC      | 28761 | Run Time Libraries | No SRU header files                                              |
| TigerSHARC | 28263 | Compiler           | long long to double conversion fails in byte-addressing mode     |
| TigerSHARC | 28267 | Compiler           | Assertion failure: bril/zp/macdefs.c:2747 with -O -never-inline  |
| TigerSHARC | 28295 | VDK                | Cannot view system stack usage in the expert linker              |
| TigerSHARC | 28490 | VDK                | CCNTx register is read in the wrong order                        |
| TigerSHARC | 28880 | VDK                | TS20x Idle thread prevents scheduling of user threads            |