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Dynamic C 9 Release Notes

Dynamic C 9

Version 9.62A (August 2020)

INTRODUCTION

These are the release notes for Dynamic C 9.

[Dynamic C 9](#) is the IDE (Integrated Development Environment) for Digi International's core modules and single-board computers based on Rabbit 2000 and 3000 processors.

The IDE includes a graphical editor and debugger, a command-line compiler, and a graphical tool (Rabbit Field Utility) for installing compiled binary firmware to a serially-connected device.

SUPPORTED PRODUCTS

- BL1800, BL1810, BL1820
- BL2000, BL2010, BL2020, BL2030, BL2040
- BL2100, BL2101, BL2110, BL2111, BL2115, BL2120, BL2121, BL2130
- BL2500, BL2510
- BL2600, BL2610
- EG2100, EG2110
- LP3500, LP3510
- OP6600, OP6700, OP6800, OP6810, OP7200, OP7210
- PowerCore FLEX Board Series, RabbitFLEX SBC40 Series
- RCM2000, RCM2010, RCM2020
- RCM2100, RCM2110, RCM2120, RCM2130
- RCM2200, RCM2250, RCM2260
- RCM2300
- RCM3000, RCM3010
- RCM3100, RCM3110
- RCM3200, RCM3209, RCM3210, RCM3220, RCM3229
- RCM3300, RCM3305, RCM3309, RCM3310, RCM3315, RCM3319, RCM3360, RCM3365, RCM3370, RCM3375
- RCM3400, RCM3410
- RCM3600, RCM3610
- RCM3700, RCM3710, RCM3720, RCM3750, RCM3760
- RCM3900, RCM3910
- SR9100, SR9150, SR9160

KNOWN ISSUES

1. Unsupported page number formats may crash DC. For example, %t is not supported in the Page Number Text field of the Page Setup dialog.

2. A terminating program can have debugging problems if a breakpoint is set on the first line when the program starts or restarts. With no breakpoint at the first line all debugging behaves normally.
3. A boolean comparison, e.g. `lhs < rhs`, will generate incorrect code if `lhs` is an (unsigned) long array by type or by cast, and `rhs` is a multi-dimensional array of any type in which the lowest dimension index is an expression of variable(s) and constant(s), e.g. `LongArray[0] >= Array[0][i + 1]`. The workaround is to enclose `rhs` in parentheses. Correct code will be generated for `LongArray[0] >= (Array[0][i + 1])`. Note that correct code is generated for `LongArray[0] >= Array[0][i + j]` because the lowest index expression does not involve any constants.
4. Source code lines in program files (.c extension) can be of any length beginning with version 9.60, but the 250 character maximum line length remains for library files.
5. The `sizeof(nonExistentStruct)`, where `nonExistentStruct` has no definition, evaluates to 0 instead of producing a compile error as it should.
6. The data type for `xstring` or `xdata` entries in an `xdata` statement can be cast to `long` without compiler warning or error, but the type will always be `long *`, and will occupy 2 bytes, not 4, for a root address which contains the `xmem` address of the entry. If one creates a struct into which the `xdata` entries are read, fields for `xdata` or `xstring` entries need to be `long *`. See sample program `xmem\xdata.c` for an example.
7. Stack relative addressing in an assembly statement, such as

```
ld    iy, (SP+@SP+VarName)
```

is limited to 255 bytes. If `VarName` is more than 255 bytes deep in the stack this will compile without warning or error but will retrieve the data that is the actual depth modulo 256. The following workaround is always safe:

```
ld    hl, @sp+VarName
add   hl, sp
ld    hl, (hl)
ld    iy, hl
```

8. Memory leaks lose about 4Kbytes per compile. Close and re-open Dynamic C periodically to avoid problems.
9. A function returning a struct does not work correctly from within a cofunction. Values copied into the local structure will be set incorrectly.
10. A C statement with only a semicolon within a `#asm` block does not compile if the block is within a global `#asm` defined function. The “c;” in section 13.1.3 of the Dynamic C manual does compile and is within a `#asm` defined function but that function is within a C defined function. Using `"rst 0x28"` is a suitable substitute for “c;” within any `#asm` block.
11. An array can be used to initialize a type compatible constant pointer, unless the array is a struct member. A workaround for this case is to initialize the pointer with the address of the struct member array which will assign the expected value to the pointer and the program will run as expected despite a warning about a type mismatch.

```
struct {
    int memberArray[];
} s;

int globalArray[];

int * const pInt = globalArray;    // ok
int * const pInt = s.memberArray; // results in an error
int * const pInt = &s.memberArray; // workaround
```

12. A debug timeout target crash may occur after hot-swapping a smaller xD card for a larger xD card using the presently documented method. For a workaround to this problem, please refer to sample program `FAT\fat_hot_swap_3365_75.c`. Note the added comments and call to the low level, undocumented `_fat_config_init()` function.
13. In debug run mode (as opposed to stand-alone run mode) following a program termination caused by a run time exception, the Dynamic C debug kernel does not always correctly restart an application subsequent to a normal program termination. Symptoms can include an apparent application hang, non-clearing of STDIO window content before adding new content, unhandled RST38, etc.

To work around the problem the application program should not be allowed to terminate normally in debug run mode. When testing small sections of code which include the possible generation of run time exceptions, adding a `while (1) ;` loop as necessary to prevent application termination can be helpful. Then, in order to restart the test code for another debug session,

type `Ctrl+Q` to stop program execution in the debugger followed by `Ctrl+F2` to reset the execution cursor back to the start of `main()`.

Note that a typical embedded application does not terminate in normal operation.

14. Sample program `Samples\RCM3300\Module_Integration\integration.c` does not run properly when run with Down Load Manager support.
15. The command-line compiler will not emit warnings and errors when compiling to a binary file. The workaround is to compile to an attached target using the “-n” command-line option for a “Null compile/syntax check without running”. If the compiler does not emit any errors, re-compile with one of the binary output options (-b, -br).
16. On the BL2600 SBCs, there is some overlap of calibration constants stored in the UserBlock. If you need to access both:
 - o single-ended unipolar channels 2 to 7 with gaincode 7 and
 - o single-ended bipolar channels 0 to 5 with gaincode 0you will need to define macro `BL26XX_CAL_ADC_OVERLAP_FIX` in your programs and re-calibrate the affected unipolar channels with gaincode 7 and ALL of the bipolar channels with all gaincodes.
17. Dynamic C 9 supports SSL 3.0 and TLS 1.0, but major web browsers are due to require TLS 1.2 or later by the end of 2020. Users who require secure connections will need to use older web browser versions that still support TLS 1.0, or switch to Rabbit 4000 or 6000-based hardware and make use of Dynamic C 10's TLS 1.2 support.

UPDATE CONSIDERATIONS

If updating an existing installation of 9.62 or earlier via the Dynamic C 9 [GitHub repository](#), you should manually apply the changes in `ucos2.patch`, found in the Dynamic C installation directory. The Dynamic C 9.62A (and later) installers include the patched file.

UPDATE BEST PRACTICES

Digi recommends testing the new release in a controlled environment with your application before you deploy firmware to production devices.

TECHNICAL SUPPORT

Get the help you need via our Technical Support team and online resources. Digi offers multiple support levels and professional services to meet your needs. All Digi customers have access to product documentation, firmware, drivers, knowledge base and peer-to-peer support forums.

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CHANGE LOG

9.62A (August 2020)

This is a recommended release.

The big change for this release is that Dynamic C is now an [Open Source project on GitHub](#). It includes source code to the previously-encrypted SSL libraries, and the license was changed to MPL 2.0 (Libraries) and ISC (Samples).

This release was made as 9.62A since it does not include changes to the compiler and only contains modified libraries, samples and documentation. It uses shortcuts (`.lnk` files) to launch the compiler with a command-line parameter of `-c A`, forcing the compiler to identify itself as 9.62A and use registry entries for version 9.62A.

Note that the bugfix for DC-391 below is included in the Dynamic C 9.62A installer, but included as a patch in the GitHub repository due to licensing issues with the uC/OS-II code. View `ucos2.patch` for instructions on how to apply it.

Users of the SSL/TLS code in Dynamic C 9.62A should be aware that it only implements TLS 1.0 and there aren't plans to update it to TLS 1.2. End users may not be able to access https webpages hosted on Rabbit 3000 products as web browsers deprecate support of TLS 1.0.

NEW FEATURES

- Incorporates Serial Flash update (40002882_A) for revision E of 45DB641 chips used in new hardware. See `PatchNotes_SerialFlash.txt` for details.
- Add `Samples/extract_flash.c` to download firmware stored on device flash.
- Add `SFLASH_ERASE.C` sample for RCM33xx and RCM37xx to erase serial flash.

BUG FIXES

- DC-73: fix calculation of `XMEMORYSIZE` in `StdBios.c` for `FAST_RAM_COMPILE` mode.
- DC-207: Correctly render SSI/RabbitWeb (shtml/zhtml) tags spanning multiple 256-byte blocks in files on FAT filesystem.
- DC-260: Improve ASIX Ethernet link recovery by allowing more time to establish link after turning PHY back on (8s vs. 2s).
- DC-283: Repeatedly setting a gateway then deleting all routers no longer fills APR cache.
- DC-358: Create `ZNETSUPPORT.LIB` from subset of `remoteuploaddefs.lib` to allow use of zconsole apps on non-RCM3300 hardware.
- DC-391: Usage of `OS_TASK_OPT_STK_CLR` with `OSTaskCreateExt()` would erase an extra byte after the stack. For stacks ending at a 64KB boundary (e.g., 0x6FFFF), it would wrap to 0 (e.g., 0x60000).
- RCM-94: support 45DB642D serial flash devices with 1024-byte page size.
- RCM-126: add `RCM3900/disable_ethernet.c` to disable ASIX Ethernet when not using TCP/IP. Chip generates excess heat if not initialized at startup.
- Fix `ASIX.LIB` error in patch2 that broke link recovery code.
- Fix `%g` formatting error for floats smaller than 0.1 (backported from Dynamic C 10).
- Fix "compile to RAM" on RCM3750 by updating `_Get_Stack_Size()` which failed for physical addresses larger than 1MB.
- Fix Timer A registers used in `pktEopen()` of `PACKET.LIB`.
- Don't allow expiration of existing ARP entry in `router_add()` (backported from Dynamic C 10).
- Backport changes from Dynamic C 10 to fix duplicate ACK and keepalive issues in `TCP.LIB`.

OTHER FUNCTIONAL CHANGES

- Document known issue #15 with the command-line compiler not emitting warnings/errors for "compile to binary" mode.
- Document known issue #16 and provide work-around for overlapping calibration constants on BL26xx SBCs. (DC-276)
- Add Function Help (CTRL-H) for `_xalloc()`.

9.62 PATCH UPDATE 2 (February 2013)

NEW FEATURES

- The `Lib\NandFlash\nflash.lib` driver library has been updated with support for Micron/Numonyx/ST NANDxxxW3A nand flash devices. Previously supported nand flash devices, used on e.g. RCM3365 and RCM3900 boards, have been discontinued and are no longer available. As of 01-Dec-2012, new production e.g. RCM3365 and RCM3900 boards will have a Micron/Numonyx/ST NAND256W3A (32MB) nand flash device installed.

Custom applications which use nand flash, whether based on e.g. RCM3365, RCM3900 boards or a custom nand flash board design, should be recompiled using Dynamic C 9.62 with this PATCH UPDATE 2 installed in order to support the new, increased selection of small-block nand flash devices.

- Includes the content of an earlier patch which adds support to Dynamic C 9.62 for a new BL2600Q board type, product ID 0x170F, comprised of an RCM3900 installed into a BL2600 base board. Please refer to the `README_BL2600Q_PATCH.TXT` file for details.

BUG FIXES

- Defect 20311 patched. On boards such as the OP6700 or TCP/IP Dev Kit, the MAC address was not being read from the serial EEPROM.
- Defect 20900 patched. When UDP send functionality's ARP resolution fails it now correctly releases its ARP table handle.
- Defect 31569 patched. When `ARP.LIB` functionality detects an IP conflict with a remote host, the response is now correct for either gratuitous or normal ARP requests.
- Defect 31780 patched. Multicast ARP table entries are no longer purged.

- Defect 32677 patched. Rabbit 3000A's SSL now works with Firefox and Safari web browsers.
- Defect 42241 patched. Rabbit now responds correctly to ARP probes (i.e. "who has IP w.x.y.z?" Ethernet broadcast) from source IP 0.0.0.0.
- Defect 42695 patched. A two-flash (i.e. 2*256K flash devices on board) DLP now has the full 256K secondary flash size available for program code.
- Defect DC-4 patched. `HTTPC.LIB`'s HTTPC post functionality, following a successful post operation, sets `HTTPC_STATE_HEADER` state.
- Defect DC-19 patched. The ASIX PHY link-fail bug work-around, broken in 9.62 PATCH UPDATE 1, is fixed. Ethernet link is restored within a few seconds of cable reconnection after either a lengthy (approximately 20 minutes or more) cable disconnection or a series of repeated quick cable disconnection, reconnection events.
- Defect RCM-7 patched. Prevent reset of a TCP connection's keep-alive timer in the case that a previously connected remote host attempts to establish a new connection which re-uses its previous TCP connection's source and destination IP addresses and port numbers.
- Defect 42746 patched. The `Samples\xalloc_stats.c` standard sample program no longer reports an error due to calling `xalloc_stats()` with a zero parameter.

OTHER FUNCTIONAL CHANGES

- In `tcp_config.lib`, the `_PRIMARY_STATIC_IP` and `_PRIMARY_NETMASK` macro definitions are now conditional to prevent warnings when overridden by custom definition(s). The default definitions remain the same, "10.10.6.100" and "255.255.255.0" respectively.
- Defining `DO_NOT_WARN_ON_RT_FULLLDUPLEX` before `#use dcrtcp.lib` prevents a warning in `REALTEK.LIB` when `RT_FULLLDUPLEX` is also defined.

9.62 PATCH UPDATE 1 (June 2011)

NEW FEATURES

- This patch includes a previous patch to add BL2600Q (an RCM3900 installed into a BL2600 base board) support to Dynamic C 9.62. See `README_BL2600Q_PATCH.TXT` in the main Dynamic C 9.62 installation folder for details.
- Two different new behaviors are available after a BIN file is loaded to the Rabbit target via the RFU:
 1. When `RFU_BIN_WAIT_FOR_RESET` is defined, after the BIN file is loaded via the RFU the application will not run until the programming cable is disconnected and followed by a hardware reset.
 2. When `RFU_BIN_WAIT_FOR_RUN_MODE` is defined and `RFU_BIN_WAIT_FOR_RESET` is not defined, after the BIN file is loaded via the RFU the application will not run until the programming cable is disconnected.

An easy place to define the desired new macro to control BIN file behavior is in Dynamic C's Project Options' Defines box. Note that when neither `RFU_BIN_WAIT_FOR_RESET` nor `RFU_BIN_WAIT_FOR_RUN_MODE` are defined, Dynamic C 9.62 behavior is per its usual. Also note that compiling in debug mode when either of these macros is defined will result in a "helpful" error message.

- Added HTTP client support via the new `Lib\tcpip\httpc.lib` library. See also the new `Samples\tcpip\http\http_client.c` sample program.

BUG FIXES

- Defect 21640 patched. Stack(s) are now allocated more space-efficiently, using `_xalloc()`'s alignment capability. Also, the correct value is assigned to the global `BaseOfStacks1` variable.
- Defect 24080 patched. `SERLINK.LIB`'s `pplink_asymap()` function now respects the peer's asynchronous serial escape character table setting.
- Defect 24260 patched. Updated `WIEGAND.LIB`'s `wiegand_init()` function to always call the appropriate `SetVectExternX000()` and the `SetVectIntern()` functions.
- Defect 24421 patched. The `errmsg.ini` file and the `ERRNO.LIB` and `ERRORS.LIB` libraries are patched to add `ESHAREDBUSY` (240) and `EFUNCBLK` 243. error codes and to make the `EFATMUTEX` (300) error code consistent throughout.
- Defect 24430 patched. Corrected the `OP68xx.LIB` library's `brdInit()` function help descriptions of PC0,1 (serial port D, RS485) and PD4,5 (serial port B, RS232).
- Defect 24474 patched. Improved the `COSTATE.LIB` library's `DelayTicks()`, `DelayMs()` and `DelaySec()` function help descriptions.

- Defect 24475 patched. Improved the `COSTATE.LIB` library's `IntervalTick()`, `IntervalMs()`, and `IntervalSec()` function help descriptions.
- Defect 24477 patched. The `COSTATE.LIB` library's `DelayTicks()` function is patched to accept `alongticks` delay parameter. This matches all other `Delay()` and `Interval()` firsttime functions.
- Defect 24743 patched. The `PowerCoreFLEX.LIB` library's `switchIn()` function now causes a `ERR_BADPARAMETER` run time error to occur if its `swin`` parameter is invalid.
- Defect 25077 patched. A work around in `IP.LIB`'s internal `is_nonlocal_subnet()` function allows multiple PPP interfaces (e.g on serial ports B and D) to work correctly.
- Defect 25307 patched. `SERLINK.LIB`'s serial ISR now preserves XPC.
- Defect 25613 patched. The `REALTEK.LIB`'s internal `emu9346_clk()` function is updated to prevent the possibility of an asm jump out of range error.
- Defect 25727 patched. The `RNET.LIB` `rn_find` function() now correctly searches for Rabbitnet device(s) on the specified RabbitNet port(s).
- Defect 25750 patched. The `FAT.LIB` library's `fat_Truncate()` function's ordering of FAT code checks is updated to work around a truncation bug caused by a mixed-type comparison (`long` vs. `unsigned long`) of the negative FAT code vs. the non-negative current file position.
- Defect 25944 patched. The `WEIGAND.LIB` library's `weigand_init()` function now correctly supports either of the input capture 1 or 2 options on Rabbit 3000 targets.
- Defect 26212 patched. The `RNET_KEYIF.LIB` library's `void rn_keyUnget()` function no longer attempts to return a value.
- Defect 27167 patched. The `BOOTP.LIB` library's `dhcp_init()` function now preserves DHCP options requests.
- Defect 27247 patched. Dynamic C's `LIB.DIR` file has been updated to remove the reference to a non-existent `RN_CFG_RCM39.LIB`.
- Defect 27384 patched. The Remote Application Update (RAU) now correctly supports customizing the number of DLP images that may be stored.
- Defect 27692 patched. The IX register's content is now preserved by `SYS.LIB`'s `updateTimers()` function.
- Defect 28314 patched. The `STDIO.LIB` library's `snprintf()` function now always null-terminates its output buffer.
- Defect 28403 patched. The RCM3300 Remote Application Update (RAU) DLM / DLP shared network information save / restore feature now works correctly.
- Defect 28846 patched. Rabbit boards equipped with an ASIX 10/100 Ethernet device and connected to some models of network switch (e.g. Foundry Fastedge X448, Linksys EF3124, Linksys EZXS55W) now reliably recover link after the Ethernet cable is disconnected then reconnected.
- Defect 29196 patched. `UCOS2.LIB`'s `ISIntExit()` is patched to prevent possible errant task switching if `OSLockNesting && -- bios_intnesting == OSLockNesting`.
- Defect 30070 patched. `Mem.lib`'s `_rs_xalloc_init()` function is patched to work around a Dynamic C compiler ORG table problem with non-flagged battery backable RAM in "Compile to Flash, Run in RAM" compile mode.
- Defect 30489 patched. The `BL26xx.LIB`'s `brdInit()` function now handles PD2 correctly for the BL2600Q's SD card detect. (A previous patch to Dynamic C 9.62 was provided to support the BL2600Q - an RCM3900 core on a BL2600 base board.)
- Defect 31863 patched. The `GRAPHIC.LIB`'s `TextBorderInit()` function help is updated to reflect a `GRAPHIC.LIB` code patch to correctly handle either a `NULL` or an empty (i.e. "") string passed in as the title parameter.
- Defect 32281 patched. `FTP_CLIENT.LIB` is updated to work with the IIS FTP server by discarding any extra arguments in the response to Rabbit's QUIT.
- Defect 32434 patched. `SDFLASH.LIB`'s `sdspi_get_csd()` function now supports SD cards that use CRC7 instead of CRC16 in their CSD block.
- Defect 32470 patched. Serial data flash sizes in `SFLASH.LIB`'s `sf_devtable[]` information array now reflect the full number of pages on each of the supported devices.
- Defect 32937 patched. Corrupted FAT MBR information no longer causes a divide by zero run time exception.
- Defect 33853 patched. All serial ports' initialization in `SERLINK.LIB` now reads `SxDR` four times, which suffices to clear any possible pending data in any serial port.
- Defect 34017 patched. `ZSERVER.LIB`'s `sspec_changefv()` no longer truncates maximum-length string type form variables to be one less than the maximum specified length.
- Defect 34070 patched. In non-blocking FAT mode, a `fat_Truncate()` call to within a file's first cluster followed by a `fat_Close()` call no longer hangs with a permanent `-EBUSY` result.
- Defect 35373 patched. Rabbit applications which do not have a battery-backed RTC may see an incorrect result at start up from the BIOS's `bios_divider19200` and `freq_divider` calculations. To prevent this baud rate miscalculation, non-battery-backed RTC Rabbit applications should now be compiled with `ROBUST_NON_BB_BAUD_RATE_CALC` added into Dynamic C's Project Options' Defines box.
- Defect 38754 patched. `RS232.LIB`'s ISRs now perform ipres as the very last op-code before returning to pre-interrupt code. This prevents any possibility of contributing to gradual stack overflow.
- Defect 38777 patched. When `uC/OS-II` is used, `SERLINK.LIB`'s ISR now prevents task switching while interrupt processing continues with reenabled interrupts.
- Defect 39302 patched. In `modbus_master.lib`, `custom_initMBMpacket()` functionality is restored for TCP-only Modbus master boards. A library function stub is now provided, along with function help.
- Defect 39386 patched. Updated `HTTTPC.LIB`'s `httpc_post_ext()` and `httpc_postx_ext()` functions to prevent errant compile-

time errors.

- Defect 25978 patched. The `Samples\FileSystem\FAT\fat_write_mbr.c` standard sample program's instructions for erasing a serial flash's previous partition information now specify clearing pages 0 through 5, inclusive.
 - Defect 26635 patched. The stock `RabbitLink\clear_param.c` (utility) and `RabbitLink\download.c` (firmware) programs now compile cleanly, without warnings or errors.
 - Defect 26636 patched. The `RabbitLink\download.c` (firmware) program now compiles without error when its `USE_DHCP` macro is commented out.
 - Defect 27230 patched. The Modbus (former module) `Samples\Modbus` standard sample programs and a Modbus-related executable utility program are supplied.
 - Defect 27289 patched. The `Samples\FileSystem\FAT\fat_write_mbr.c` standard sample program now explicitly disallows partitioning of an SD card flash memory device.
 - Defect 36077 patched. The `Samples\OP7200\Calib_Save_Retrieve\savecalib.c` standard sample program's serial cable connection instructions now refer to the appropriate header (J10).
 - Defect 38736 patched. The `Samples\OP7200\LCD_TouchScreen\cal_touchscreen.c` standard sample program now enables the backlight and sets the screen contrast to avoid a blank appearance.
-

9.62 (May 2008)

BUG FIXES

- Defect #25923 fixed. Corrected `.c` part of file mask for `grep`.
 - Defect #25748 fixed. Corrected initialization of RCM3900 and RCM3910 boards' SD card select and SD card detect lines.
-

9.60 (February 2008)

BUG FIXES

- Defect #24366 fixed. TCP connections to peers with large receive windows no longer time out or reset.
 - Defect #24941 fixed. The built-in uCOS-II statistics variables are now correctly initialized when used, so the `OS_TaskStat()` function now always provides a reasonable `OSCPUUsage` value.
 - Defect #24990 fixed. Incorrect `#asm` block accesses of the `auto int statusbyte` variable in the `Lib\RabbitNet\RNET_KEYIF.LIB` library's `rn_keyProcess()` function have been fixed. As a result of this fix, the `Samples\RabbitNet\RN1600\zmenu.c` sample now works correctly when making keypad menu selections.
 - Defect #25085 fixed. Partition `begin / end` tests in `PART.LIB's mbr_ValidatePartitions()` function now work correctly. A code generation problem work around is implemented for boolean conditional expressions which reference multi-dimensional arrays of long integer type where a non-constant expression is used to calculate at least one of the indices. The work around is to encapsulate such references in parentheses and explicitly cast the reference to the appropriate long integer type within the encapsulating parentheses.
 - Defect #25143 fixed. In non-blocking mode, `FAT.LIB's fat_ReadDir()` function no longer returns success (0) when zero bytes are read from the directory entry. In this case, `fat_ReadDir()` now correctly returns `-EBUSY`.
-

9.52 (February 2007)

BUG FIXES

- Defect #19939 fixed. Improper code generation with constant indicies in parenthesis used with multi-dimensional arrays now generates a warning. A workaround is detailed in the `ReadMe.txt` file.
 - Defect #20472 fixed. PPP serial more reliable with bad link quality.
 - Defect #81727 fixed. `OP72xx.LIB serMode()` function now always returns the appropriate result code.
 - Defect #81695 fixed. Added check for years entered as more than 2 digits. Added date range notification to stdio window.
-

9.50 (September 2006)

NEW FEATURES

- Added the `error_message` function to `errors.lib`. This function returns a descriptive string in `xmem` corresponding to an error code.
- New sample `tcpip\http\cgi_concurrent.c` demonstrates how to manage concurrent CGI instances accessing a single shared resource, including proper behavior when the HTTP connection aborts.

BUG FIXES

- Defect #81458 fixed. Missing right parens in statements generated bogus line numbers, and a 2nd compile could cause a fatal error.
- Defect #81474 fixed. Compiler reported bogus error message about an unclosed comment at end of file if there was a name collision between symbols.
- Defect #81482 fixed. Execution cursor could be incorrect when stepping over a nodebug function containing `_TRACE`.
- Defect #81485 fixed. DC now generates correct code for complex conditionals in cofunctions.
- Defect #81546 fixed. Constant structure assignment fixed.
- Defect #81556 fixed. `float to unsigned long cast` error fixed.
- Defect #81557 fixed. Constant multi-dimensional array of structs access fixed.
- Defect #81564 fixed. Forward jumps in `asm const` blocks now correctly fixed.
- Defect #81568 fixed. Setting `FAST_INTERRUPT` to 1 in separate I&D no longer generates compile-time errors.
- Defect #81575 fixed. Execution tracing no longer generates a Target communication error.
- Defect #81587 fixed. Many memory leaks fixed.
- Defect #81613 fixed. Error log exception values changed.
- Defect #81636 fixed. Nested structure and union member access and assignment fixed for multiple levels of structure nesting.
- Defect #81255 fixed. Dynamic C will now exit if the project file is read-only.
- Defect #81448 fixed. Dissassemble at cursor function was not working in libraries.
- Defect #81449 fixed. Warnings highlighted incorrect lines and the single step debug cursor placement was sometimes incorrect in library code.
- Defect #81450 fixed. Copy-and-paste containing TABs could cause strange behavior.
- Defect #81455 fixed. Watches for some constant constructs not working.
- Defect #81476 fixed. Dynamic C no longer can consume all available virtual memory and effectively lock up the PC.
- Defect #81483 fixed. Project open/close did not cancel if modified file close query was cancelled.
- Defect #81490 fixed. You can now right click for copy/paste in project options defines box.
- Defect #81547 fixed. The compiler can now use COM10 or higher for target communications.
- Defect #81566 fixed. Switching focus to DC no longer moves the cursor to the compiler message box.
- Defect #81572 fixed. Memory leak in compiler messages window corrected.
- Defect #81573 fixed. Debug mode problems when running BL1810 (14 MHz) JackRabbit (did not stop on F4) corrected.
- Defect #81576 fixed. Switch to debug mode (shift + F5) now works in compile-to-RAM mode.
- Defect #81621 fixed. Flyover watch expressions are now correct for string constants in `xmem` code.
- Defect #81631 fixed. Watching string literals has been fixed.
- Defect #81480 fixed. `FS2.LIB's fs_sync()` will no longer return an uninitialized value as its result.
- Defect #81487 fixed. Constant `LZ_LOOK_AHEAD_SIZE` now defined in `LZSS.LIB`.
- Defect #81492 fixed. `STRING.LIB's memcpy()/memmove()` functions returned `src` instead of `dst` if copy size was zero.
- Defect #81543 fixed. Timeout is no longer calculated during SYN handshake.
- Defect #81560 fixed. `PCFR` and `PCFRShadow` were not set correctly in `spa_init()` in `RS232.LIB`.
- Defect #81570 fixed. Corrected `removeram` origin directive definition.
- Defect #81574 fixed. Dynamic C crash and exit due to incorrect origin directive definition fixed.
- Defect #81577 fixed. `removeram` origin now defined for flash compile mode.
- Defect #81580 fixed. Documentation: `WrPortI()` can be interrupted by ISRs.
- Defect #81581 fixed. `sf_enableCS()` and `sf_disableCS()` now protect shadow values when calling `WrPortI()`.
- Defect #81585 fixed. Setting a watch expression will no longer corrupt memory in non-separate I&D mode.
- Defect #81590 fixed. RabbitFLEX keypads with other than 2 outputs now work correctly. Also, this change will cause the outputs on a 2-output keypad to swap, so reported keycodes on a 2-output keypad will change.
- Defect #81597 fixed. DHCP Fallback is working again.
- Defect #81604 fixed. `xalloc_stats(0)` is working again.
- Defect #81608 fixed. DHCP client now updates the IP address assigned when the server requires it.
- Defect #81657 fixed. On the ASIX AX88796 Ethernet chip, when the Ethernet cable is rapidly plugged and unplugged, the PHY could fail to detect a connection. The ASIX driver will now periodically check the link status, and will reset the PHY when it is down to work around the problem.
- Defect #81662 fixed. Analog and Ethernet related macros are now defined appropriately for the BL2000B.
- Defect #81663 fixed. The BL2010 and BL2030 specific `ADC_10BIT` macro has been corrected to read `ADC_10BIT` (capital letter O typo changed to a numeral zero).
- Defect #81666 fixed. The TCP/IP stack will no longer respond on TCP port 0 when the reserve ports functionality is enabled.

- Defect #81667 fixed. Programs now initialize properly after reset. This bug had only affected non-looping programs.
 - Defect #81675 fixed. BIOS's `UserBlockAddr` variable is now correct in Compile to flash, run in fast RAM compile mode when target board has a unique version 5 ID block installed.
 - Defect #81678 fixed. Can now read all of User block when version 5 unique ID block and large size User block are installed.
 - Defect #81507 fixed. `Userblock_clear.c` now correctly attempts to clear only the available User block area.
 - Defect #81508 fixed. `Userblock_info.c` now reports correct information for unique v. 5 ID block.
 - Defect #81551 fixed. `SerialToEthernet/FastSer2Eth.c` no longer causes timeout errors.
 - Defect #81552 fixed. `MultiPort_S2E - Errors` no longer generated when compiling to a `.bin` file.
 - Defect #81559 fixed. The `d1m_serial_2_flash.c` sample now works again.
 - Defect #81561 fixed. Sample `zconsole\userblock_tcpipconsole.c` did not compile. `NetConfSave` is now defined.
 - Defect #81578 fixed. The RFU will no longer issue an error if the file dropdown list exceeds 9 entries.
 - Error logging is updated to version 2. Run time exceptions are now reported / recorded as negative int values and Dynamic C's traditional run time error codes have changed. See details in `Lib\errno.lib` and in `Lib\BiosLib\errors.lib`.
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9.41 (February 2006)

NEW FEATURES

- Samples, libraries and documentation added to support the new customizable RabbitFLEX boards.
 - Dynamic C's `LIB.DIR` library files list mechanism now searches for library files within a specified directory tree. The option to specify a complete or relative pathlist to each individual library file remains. Note that each library file name must be unique, regardless of whether the library is explicitly specified or is found via searching a specified directory tree. Also note that this feature was actually implemented in Dynamic C 9.30.
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9.40 (January 2006)

NEW FEATURES

- Libraries and documentation updated for the OP7200 family, which has a new LCD controller. The updated libraries work with both old and new versions of the OP72xx. A BIN file created using the new libraries will also work with both old and new versions of the OP72xx. (Note that the old libraries will not work with the new OP72xx.)

BUG FIXES

- Defect #81131 fixed. New compiler fixes the "undefined but used global label main" problem.
- Defect #81159 fixed. Disassembler correctly prints signed values. Note that this bug was actually fixed in version 9.30.
- Defect #81198 fixed. New compiler fixes the "RCM3700 #rcodorg error - out of memory" problem.
- Defect #81199 fixed. New compiler fixes the "out of memory conditions can put Dynamic C in an unusable state" problem.
- Defect #81335 fixed. Assembler no longer generates incorrect binary for `rr a'` and related instructions. Note that this bug was actually fixed in version 9.30.
- Defect #81497 fixed. "bbram" variables are not allowed with the "static" qualifier.
- Defect #81505 fixed. Some RabbitWeb guard expressions incorrectly did not compile.
- Defect #81534 fixed. Writing to internal interrupt vector offsets higher than 0x0100 in separate I&D space no longer corrupts memory.
- Defect #81535 fixed. Lexer now properly recognizes '0h' and '0b'.
- Defect #81536 fixed. RabbitLink did not work in DC 9.30.
- Defect #81539 fixed. IO bug instructions in 2000 processors at end of asm blocks now properly emit nops following the instruction.
- Defect #81541 fixed. Command line compiler now compiles and runs programs on boards with small sector flash (BL1800/1810).
- Defect #81222 fixed. New `lib.dir` handling fixes this problem.
- Defect #81377 fixed. A scroll bar appears when necessary.
- Defect #81468 fixed. The parameters of the targetless compile boards in the Board Selection list of the Project Options dialog can now be modified.
- Defect #81491 fixed. The board description had been missing from the compile dialogs if the Project Options dialog had never been opened since installing Dynamic C.
- Defect #81502 fixed. Rabbit 3000A and 4000 keywords added to syntax highlighting. This was fixed for Dynamic C 9.30.
- Defect #81462 fixed. Cursor placement is now correct when stepping over or into a nodebug function containing `_TRACE`.
- Defect #81500 fixed. Leaving the execution tracing window open while running for a long time no longer causes a problem.
- Defect #81477 fixed. For the PowerCoreFLEX ADC capability, it is now no longer possible for an ADC ISR to occur in the middle of

reading the raw analog data.

- Defect #81514 fixed. SMTP library now works correctly in non-RabbitSys mode (DC 9.30-only defect).
 - Defect #81525 fixed. `BBRAM_RESERVE_SIZE` now correctly calculated.
 - Defect #81526 fixed. `BBRAM_RESERVEORG` now correctly calculated in non-RabbitSys mode.
 - Defect #81529 fixed. Duplicate `USERDATA` definitions removed.
 - Defect #81531 fixed. Duplicate cloning definitions removed.
 - Defect #81532 fixed. Functionality moved to `RemoteUpload` libraries.
 - Defect #81540 fixed. Realtek driver now works correctly for SmartStar.
 - Defect #81515 fixed. PowerCoreFLEX version of `sflash_test.c` will no longer display uninitialized variables on failure.
 - Defect #81537 fixed. RabbitLink did not work in version 3.01.
 - Defect #81538 fixed. RabbitSys user program did not run after being loaded through RFU 3.01.
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