

Questions:

One of the following circumstances may happen during the use of ARM Compiler version 6 (AC6)

- Scenario: lower code execution speed
- Scenario: Many more stacks are needed
- Scenario: Failed to run offline
- Scenario: printf failed to work

Answer:

- Scenario: Codes run at a slower speed

The possible reason is that the user selected AC5 default optimization level (-O0) rather than AC6 default optimization level (-Oz image size).

Solution: Just switch to AC6 default optimization level (-Oz image size).

- Scenario 2: Many more stacks are needed

When AC6 compiler's -O0 level is used, n-level conditional expression may require a huge amount of stacks.

Solution: this problem can be fixed by using an optimization level other than -O0.

- Scenario 3: Failed to run offline

When AC6 compiler's -O0 level is used without checking "Microlab" option, it is likely to cause offline run failure (it can be used in debugging mode but it would fail after unplugging downloader)

Solution: Check the "Microlab" option.

- Scenario 4: Printf failed to work

AC6 compiler differs from AC5 in terms of printf initialization.

Solution: See the following printf example based on AT32 BSP

Note: The latest BSP version on ARTERY's official website has no such problem.

Printf is located: \project\at32f403a_407_board\at32f403a_407_board.c

Find **at32_board.c** (it is located in BSP\project\at_start_f403a\examples\usart\printf). Original code is as follows:

```

/* Suport printf function, useMicroLib is unnecessary */
#ifdef __CC_ARM
#pragma import(__use_no_semihosting)
struct __FILE
{
    int handle;
};

FILE __stdout;

void _sys_exit(int x)
{
    x = x;
}
#endif

#ifdef __GNUC__
/* With GCC/RAISONANCE, small printf (option LD Linker->Libraries->Small printf
set to 'Yes') calls __io_putchar() */
#define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
#else
#define PUTCHAR_PROTOTYPE int fputc(int ch, FILE *f)
#endif /* __GNUC__ */

```

Changed code is as follows. This is to enable normal use of printf on both AC5,AC6 compilers.

```

/* suport printf function, usemicrolib is unnecessary */
#if (__ARMCC_VERSION > 6000000)
__asm (".global __use_no_semihosting\n\t");
void _sys_exit(int x)
{
    x = x;
}
/* __use_no_semihosting was requested, but _ttywrch was */
void _ttywrch(int ch)
{
    ch = ch;
}
FILE __stdout;
#else
#ifdef __CC_ARM
#pragma import(__use_no_semihosting)
struct __FILE
{
    int handle;
};
FILE __stdout;
void _sys_exit(int x)
{
    x = x;
}
#endif
#endif

#if defined (__GNUC__) && !defined (__clang__)

```

```
#define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
#else
#define PUTCHAR_PROTOTYPE int fputc(int ch, FILE *f)
#endif
```

Type: MCU application

Applicable products: AT32 series

Main function: AC6 compiler

Other function: None

Document revision history

Date	Revision	Changes
2022.3.2	2.0.0	Initial release

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