

RENESAS TOOL NEWS on April 16, 2004: RSO-M3T-NC30WA-040416D

## A Note on Using C-Compiler Package M3T-NC30WA

Please take note of the following problem in using the M3T-NC30WA C-compiler package for the M16C/60, M16C/30, M16C/Tiny, M16C/20, M16C/10, and R8C/Tiny series MCUs:

- On a multiplication between a variable of type unsigned/signed long and an immediate value
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### 1. Versions Concerned

M3T-NC30WA V.5.00 Release 1 through V.5.30 Release 1

### 2. Description

Performing a multiplication between a variable of type unsigned/signed long and an immediate value may result in the C compiler being terminated forcefully with the following error message displayed:

The program has performed an illegal operation . . . .

### 3. Conditions

This problem occurs if the following two conditions are satisfied:

- (1) Any of the optimizing options O1, -O2, -O3, -O4, -O5, -O, -OR, and -OS is used.
- (2) A multiplication is performed between a variable of type unsigned/signed long and an immediate value of 0xffffffff.

### 4. Example

```
-----  
unsigned long g;      /* Condition (2) */  
void func(void)
```

```
{
  g = g * 0xffffffff; /* Condition (2) */
}
```

---

## 5. Workaround

This problem can be circumvented by going through the following steps:

- (1) Define a temporary auto variable tmp.
- (2) Assign the immediate value 0xffffffff in Condition (2) to tmp.
- (3) Place a dummy asm function immediately after the assignment expression in (2).
- (4) Perform the multiplication between a variable and the temporary auto variable in (1) instead of the immediate value.

Example:

---

```
unsigned long g;
void func(void)
{
  unsigned long tmp; /* Temporary auto variable tmp defined */

  tmp = 0xffffffff; /* Immediate value assigned to tmp */
  asm(); /* Dummy asm function placed */
  g = g * tmp; /* tmp used instead of immediate value */

  ...
}
```

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## 6. Schedule of Fixing the Problem

We plan to fix this problem in our next release of the product.

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