

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

Please take note of the following problem in using C compiler (with an assembler and integrated development environment) M3T-NC30WA for the M16C/60, M16C/30, M16C/20, and M16C/10 series MCUs:

- On referencing return values that use register variables after calling inline functions
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#### 1. Versions Concerned

M3T-NC30WA V.5.00 Release 1 and Release 2

#### 2. Description

Referencing return values that use register variables after calling inline functions results in the correct registers not being accessed.

#### 3. Conditions

This problem may occur if the following seven conditions are satisfied:

- (1) The -fER option and/or one or more of the optimizing options -O, -O[3-5], -OR, and -OS are used.
- (2) The -ONBSD option is not selected.
- (3) A register variable is used as the argument or return value of an inline function.
- (4) The return value described in (3) above is not rewritten after calling the inline function.
- (5) The return value of the inline function is assigned to a register variable different from the one used as the return value.
- (6) On the register variable into which the return value is assigned in (5) some of the four-rule operations are performed, and the register variable is not accessed thereafter.
- (7) The return value of the inline function is accessed after the assignment in (5).

#### 4. Example

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```

extern long gl;
inline long func(long vl)
{
    return vl;
}

void smp(void)
{
    register long l,ll;

    l = gl;
    l = func(l);      /* Condition (3) */
    ll = l;           /* Condition (5) */
    ll -= gl;         /* Condition (6) */

    /* Register variable l not accessed correctly */
    gl = l;           /* Condition (7) */
}

```

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## 5. Workaround

This problem can be circumvented in either of the following ways:

- (1) Select the -ONBSD option.
- (2) Place a dummy asm function immediately after calling an inline function.

[Example]

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```

extern long gl;
inline long func(long vl)
{
    return vl;
}

void smp(void)
{
    register long l,ll;

    l = gl;
    l = func(l);
    asm();      /* A dummy asm function placed */
    ll = l;
    ll -= gl;
    gl = l;
}

```

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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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