RENESAS Tool News

A Note on Using C compilers M3T-NC308WA, M3T-NC30WA, and M3T-NC79WA; and Assemblers AS308, AS30, and AS79
--On Linking Relocatable Files--

Please take note of the following problem in using the M3T-NC308WA, M3T-NC30WA, and M3T-NC79WA C compilers (with an assembler and integrated development environment) and the AS308, AS30, and AS79 assemblers:

- On linking relocatable module files with no sections

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1. **Products and Versions Concerned**

   * C compilers:
   M3T-NC308WA V.1.00 Release 1 through V.5.10 Release 1
       for the M32C/80, and M16C/80 series
   M3T-NC30WA V.2.00 Release 1 through V.5.20 Release 1
       for the M16C/60, M16C/30, M16C/Tiny, M16C/20, M16C/10, and R8C/Tiny series
   M3T-NC79WA V.2.00 Release 1 through V.4.10 Release 1
       for the 79xx series

   * Relocatable Assemblers
   AS308 V.1.00 Release 1 and V.2.00 Release 1
       for the M32C/80 and M16C/80 series
   AS30 V.1.00 Release 1 through V.3.20 Release 1
       for the M16C/60, M16C/30, M16C/20, and M16C/10 series
   AS79 V.1.00 Release 1 through V.3.20 Release 1
       for the 79xx series

2. **Description**
   Successively linking relocatable module files with no sections may end in failure with an error message "value is undefined" or "Illegal format" displayed.

2.1 Conditions
This problem occurs if the following three conditions are satisfied:

(1) Sixty-five or more relocatable files exist in the program.

(2) Thirty two or more relocatable files with no sections (for example, those containing only the declarations of external variable and functions) are linked at the thirty-third and later in linking order.

(3) Relocatable files with sections are linked after the files in (2) above.

2.2 Example

>ln308 @cmdfile

```
Linking Order   .r30 file
----------------------------------
  1            file1.r30
 .......................
 32            file32.r30
----------------------------------
 33            file33.r30     32 relocatable files with no sections
 ........................
 64            file64.r30
----------------------------------
 65            file65.r30
----------------------------------
```

3. **Workaround**
This problem can be circumvented in either of the following ways:

(1) Change the linking order so that 32 or more relocatable files with no sections cannot be in series.

(2) Create and add relocatable files with zero-size sections for the same purpose as in (1).

Examples of source files with zero-size sections
* In C language
empty.c
```
-----------------------------------------
#pragma ASM
.section empty
#pragma ENDASM
```

```
-----------------------------------------

* In assembly language
  empty.a30
-----------------------------------------

.section empty
.end
-----------------------------------------


Modified example
Linking Order   .r30 file
---------------------------------
  1           file1.r30
......................
  32          file32.r30
---------------------------------
  33          file33.r30
  34          empty.r30      Create this relocatable file with
......................       zero-size sections and place it at
......................       the 34th line.
  64          file63.r30
---------------------------------
  65          file64.r30
  66          file65.r30
---------------------------------
```

4. **Schedule of Fixing the Problem**

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