

CUSTOMER NOTIFICATION

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78K0 Series Assembler Package RA78K0 Ver. 3.70 Operating Precautions

Windows (Japanese Version)
HP9000 Series 700 (HP-UX)
SPARCstation Family (SunOS/Solaris)

Be sure to read this document before using the product.

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Thank you for purchasing 78K0 Series assembler package RA78K0 Ver. 3.70.

This document explains the modifications from RA78K0 Ver. 3.60 to Ver. 3.70, cautions, usage restrictions, and correction of documents.

Be sure to read this document before using RA78K0 Ver. 3.70.

1. USER'S MANUAL

The following user's manuals are available for this version as a PDF file only.

- RA78K0 Assembler Package - Structured Assembly Language (document number: U11789E)
- RA78K0 Assembler Package - Language (document number: U17014E)
- RA78K0 Assembler Package - Operation (document number: U17015E)
- PM plus (document number: U16934E) ^{Note}

Note Windows version only.

2. PRODUCT CONTENTS

The tool versions when RA78K0 Ver. 3.70 is installed are as follows.

Component	Tool	Version
RA78K0 Ver. 3.70	Structured assembler preprocessor ST78K0	Ver. 3.70
	Relocatable assembler RA78K0	Ver. 3.70
	Linker LK78K0	Ver. 3.70
	Object converter OC78K0	Ver. 3.70
	Librarian LB78K0	Ver. 3.70
	List converter LCNV78K0	Ver. 3.70
PM plus Ver. 5.20	PM plus PM plus	Ver. 5.20

Caution PM plus Ver. 5.20 for HP9000 Series 700 and SPARCstation Family is not available.

3. SUPPORTED TOOLS

Use the following tool versions when used in combination with RA78K0 Ver. 3.70.

- PM plus: PM plus Ver. 5.20 or later
- Compiler: CC78K0 Ver. 3.60 or later
- Integrated debugger: ID78K0-NS Ver. 2.52 or later
ID78K0-QB Ver. 2.81 or later
- System simulator: SM78K0 Ver. 2.52 or later

4. ITEMS REVISED FROM Ver. 3.60 TO Ver. 3.70

This section explains the changes from Ver. 3.60 to Ver. 3.70, concerning usage restrictions, assembler, and PM plus.

4.1 Changes in Usage Restrictions

This section explains the changes in the usage restrictions. The item number corresponds to the number that has been reported in the usage restriction documents.

4.1.1 Removal of usage restrictions

The following three restrictions have been removed (reported in SBG-DT-04-0111).

No.9 Concatenate (&) will not be linked if the macro quasi directive IRP is nested.

[Description]

Nesting IRP that includes the character string concatenation symbol "&" will render the macro expansion results illegal since the parameter is not converted.

No.35 Allocation of segments whose size is 0 may be illegal.

[Description]

Allocation of segments may be illegal when the following three conditions are satisfied.

- (1) A segment whose size is 0 exists.
- (2) The segment of (1) is not addressed.
- (3) A segment that is addressed to a segment other than (1) exists.

A segment whose address is not output to the link list in the ascending address order is an illegally-allocated segment.

No.36 Name definition in the assembler results in an A106 error in the object converter.

[Description]

Symbol information may be illegal when all the conditions shown below are satisfied, which results in an A106 error in the object converter. In addition, the error message "Ab019 : Reading of file went wrong." will be output when the load module file is downloaded by the debugger.

- (1) The name is defined in the structured assembler source or assembler source
- (2) The name of (1) is externally referenced as a function name by the C source.
- (3) The file of (1) is linked after the C source of (2).

4.1.2 Addition of usage restriction

The following restriction has been added (reported in SBG-DT-04-0111).

No.37 An A402 error is output in the linker if the source file name consists of 15 or more characters.

[Description]

An A402 error is output in the linker when the following two conditions are satisfied.

- (1) The source file name consists of 15 or more characters.
- (2) Debug information is not output by the assembler.

The output of debug information is not specified in any of the following cases.

- “Release Build” is selected in PM or PM plus.
- The “-nga -ng” option is specified in the assembler.

4.2 Changes in Assembler

This section explains the changes in RA78K0 Ver. 3.60 to Ver. 3.70.

4.2.1 Support of space and 2-byte character use for folder name

The space and 2-byte characters can now be used for the folder name. However, they still cannot be used for file path specification. (See **5.2.5 Caution on installation directory.**)

4.2.2 Change of messages

The output format and number of error and warning messages have been changed. As a result, the error message highlighted display function and help jump function of PM plus are now supported.

- Change of symbols

The symbols have been modified as shown below.

Old Symbol	New Symbol	Meaning
A	F	Fatal error
F	E	Error
F	C	Internal error
W		Warning

- Addition of digit to message number

The number of message digits has been increased from three to four (xxx → Nxxx), and the first digit (N) now indicates a number corresponding to the related command.

There is no change in second to fourth digits.

Added Number	Corresponding Command Name
1	Structured assembler preprocessor
2	Assembler
3	Linker
4	Object converter
5	Librarian
6	List converter

- Change of format

The format of the message has been changed and unified as shown below.

[file-number(line-number) :] tool-name key-word symbol-and-number: message

Output example:

sample.asm(26) : RA78K0 error E2202: Illegal operand

4.2.3 Expansion of include file path specification function

The number of include file paths that can be specified in the structured assembler preprocessor and assembler has been expanded from 8 to 64.

4.2.4 Expansion of library file search path specification function

The number of library file search paths that can be specified in the linker has been increased from 10 to 64.

4.2.5 Addition of function to specify series-common objects

The -COMMON option that is used to specify the objects common to the series has been added to the assembler.

4.2.6 Addition of function supporting on-chip debug

The -GO option that is used to specify the target program size for on-chip debugging has been added to the linker.

4.2.7 Addition of function to support security ID

A relocation attribute for security ID "SECUR_ID" has been added to the code segment CSEG. The default segment name is "?CSEGS!".

The -GI option that is used to specify the security ID has been added to the linker.

4.2.8 Expansion of object filling specification function

The function to specify object filling values has been expanded in the object converter. When specification of this option is omitted, it is now assumed that the -U0FFH has been specified and the vacant space is filled with 0FFH.

In addition, the -NU option that specifies no filling has been added.

4.2.9 Change of interpretation when object address order sort specification option is omitted

When the object address order sort specification option is omitted, it is now assumed that the -R option has been specified.

Specify the -NR option to output the object in the order stored in the load module file.

4.2.10 Addition of option byte function

A function has been added to define a default segment (?CSEGOB0 to ?CSEGOB4) to each address and set the initial value loaded from the device file when using a device that has the option byte specification function but where the option byte is not specified.

4.2.11 Addition of segment allocation prohibited area

When the security ID is specified, segments cannot be allocated to addresses 85H to 8EH, which are reserved for security ID specification.

When the on-chip debug function is used, segments also cannot be allocated at addresses 02H to 03H, 84H, the area 8FH to “program size specification +1”, which are reserved for on-chip debugging.

4.2.12 Change of handling of @@CALF segment by linker

Handling of the @@CALF segment that is output from the CC78K0 has been changed. If the size of the @@CALF segment is 0, the relocation attribute is assumed to be UNIT and it is allocated at linking. As a result, the ROM area is segmented at address 0800H if the size of the @@CALF segment is 0.

4.2.13 Expansion of functions in option dialog box

The edit functions used when specifying the following options have been added to the option specification dialog box in PM plus.

Command	Option
Structured assembler	Include file search specification
	Symbol definition
Assembler	Include file search specification
	Symbol definition
Linker	Library file specification
	Library file search path specification

4.3 Changes in PM plus

This section explains the changes in PM plus Ver. 5.10 to Ver. 5.20.

4.3.1 Support of space and 2-byte character use for folder name

The space and 2-byte characters can now be used for the folder name. However, they still cannot be used for the file path specification. (See **5.2.5 Caution on installation directory.**)

4.3.2 Improvement of performance

The performance of the following types of processing has been improved.

- Build processing
- Processing to close workspace
- Processing to close project window tree

4.3.3 Enhancement of batch build function

The batch build function has been enhanced. Build and re-build of multiple projects can be performed in the order they are specified. In addition, the order is memorized.

4.3.4 Addition of error message highlight function

Error message lines and warning message lines displayed in the Output window are now displayed in red and blue, respectively.

4.3.5 Support of function to jump error help

A function to jump from an error message displayed in the Output window to the corresponding help has been added.

4.3.6 Addition of history edit function

A function to edit the history a file and a workspace file has been added.

4.3.7 Support of regular expression

A function to use the regular expression when performing search or replace has been added.

The display of this function was previously dimmed and cannot be selected because it was not supported.

4.3.8 Support of extension link

The extension "prw" is now linked with PM plus.

5. CAUTIONS

Cautions on using RA78K0 Ver. 3.70 are described below.

5.1 Device File

A device file is necessary to execute the RA78K0. The device file is not included in the RA78K0 package. Download the device file via ODS (online delivery service).

NEC Electronics Microprocessor website (URL: http://www.necel.com/micro/index_e.html)

→ [Development Tools Download] → [DeviceFile]

5.2 Cautions on Installation

5.2.1 Product ID

A product ID is required to install RA78K0 Ver. 3.70. The product ID is shown on the medium or medium case.

5.2.2 Caution on activating installer

Insert the CD-ROM of RA78K0 Ver. 3.70 (Windows version) in the CD-ROM drive. The installer is started automatically. If it does not start automatically, execute "setup.exe" in the directory DISK1 under RA78K0 from Windows Explorer.

5.2.3 Caution on restarting computer

Because it may be necessary to restart the computer after installation, terminate all other applications.

5.2.4 Caution on authority for installation

Administrator right is required for installation of RA78K0 Ver. 3.70 in Windows NT, Windows 2000, or Windows XP.

5.2.5 Caution on installation directory

Do not install RA78K0 Ver. 3.70 in a directory with a name containing a space; otherwise the development tools may not be correctly executed.

5.2.6 Caution on re-installation

To re-install RA78K0 Ver. 3.70, uninstall the copy of RA78K0 Ver. 3.70 already installed. If this product is installed in a different directory without uninstalling the first copy of RA78K0 Ver. 3.70, the first copy of RA78K0 Ver. 3.70 already installed cannot be uninstalled.

5.2.7 Caution on file created at installation

The following file will be created after RA78K0 Ver. 3.70 has been installed. This file is necessary for uninstalling RA78K0 Ver. 3.70 and must not be deleted (the installation destination is assumed to be C:\NECTools32).

C:\NECTools32\SETUP*.*

5.2.8 Caution on language used in Windows

RA78K0 Ver. 3.70 can be installed in the English Windows environment only.

If an attempt is made to install RA78K0 Ver. 3.70 in an environment other than English Windows, a message indicating a file transfer error is displayed and the installation is aborted.

This situation also occurs if a language other than English is specified as the system language in the "Regional Settings Properties" tab.

5.2.9 Installation folder

Be sure to install RA78K0 Ver. 3.70 in the folder in which other NEC Electronics tools are installed; otherwise the tool may not be able to be activated.

5.2.10 Caution on PM plus help

The PM plus help is supplied in the HTML help format. If the help does not operate correctly, proceed as follows.

- Install Microsoft Internet Explorer 5.0 or later (IE5.5 SP2 or later recommended)

The font size of the help menu is affected by the font settings in Internet Explorer. The display is too large in the default size ("Medium") of Internet Explorer. Therefore, change the font size to "Smallest" in [Fonts] from the [View] menu and restart the help.

5.3 Cautions Related to Assembler

See **APPENDIX B** in the **RA78K0 Assembler Package Ver. 3.70 Operation User's Manual** for cautions on the assembler.

5.4 Cautions on PM plus

See the **PM plus Ver. 5.20 User's Manual** for cautions on PM plus.

6. RESTRICTIONS

This section explains restrictions only apply to RA78K0 Ver. 3.70.

Since the numbers assigned to the restrictions have not been changed, the restriction numbers shown below are not consecutive.

6.1 List of Restrictions

No.	Restrictions
1	An error occurs if a control statement is crossed in a structured assembly language description.
5	Restriction that the assembler performs illegal processing if the label receiving the effect of optimization is described in the saddr part when an EQU definition is performed for a bit symbol with the value saddr.bit
11	The dependence of include files when the structured assembler is activated by PM plus.
15	The dependence of include files when the assembler is activated by PM plus.
37	An A402 error is output in the linker if the source file name consists of 15 or more characters.

6.2 Details of Restrictions

No.1 An error occurs if a control statement is crossed in a structured assembly language description.

[Description]

If a control statement is divided or crossed by `#ifdef-#endif`, an error occurs when `#ifdef` is true.

Example:

```

switch (mode)
#ifdef stsw ← Range from #ifdef to #else/#endif
  case 1: ← Range from case to next case/default/ends
    break
#endif
  default:
    break
ends

```

[Workaround]

In the case of nesting, there is no error. The source should be rewritten so that the ranges of the control statements do not cross.

```

#ifdef stsw ← Range from #ifdef to #else/#endif
  switch (mode) ← Range from case to next case/default/ends
    case 1:
      break
    default:
      break
  ends
#else
  switch (mode)
    default:
      break
  ends
#endif

```

No.5 Restriction that the assembler performs illegal processing if the label receiving the effect of optimization is described in the `saddr` part when an EQU definition is performed for a bit symbol with the value `saddr.bit`

[Description]

The assembler performs illegal processing if the label receiving the effect of optimization is described in the `saddr` part when an EQU definition is performed for a bit symbol with the value `saddr.bit`.

[Phenomenon]

The assembler performs illegal processing in the following cases.

- When saddr is 0FD20H, path 1 of a label is outside the area, and path 2 is inside the area, an error is output in path 1 for the EQU definition line, but not output in path 2. At this time, the object is created but it is incorrect.
- When saddr is 0FF1FH, path 1 of a label is inside the area, and path 2 is outside the area, no error is output in path 1 for the EQU definition line, while an error is output in path 2. The following assembly error will be output for a label that is defined after this EQU symbol has been referenced.

F410 Phase error

Also, when this label is referenced, the object becomes incorrect.

[Workaround]

There is no workaround.

No.11 The dependence of include files when the structured assembler is activated by PM plus.

[Description]

In checking the dependence of include files described in structured assembler language when creating a make file in PM plus, only the deletion of comments and character strings is processed, and conditions such as #ifdef are ignored.

[Phenomenon]

In the description example below, the #ifdef, #else, and #endif lines are ignored. As a result, the existence of the file name specified by #include is checked regardless of whether the file is referenced or not. An error will occur if the file specified by #include does not exist when executing a build.

Example:

```
#ifdef SYM
#include "func1.inc"
#else
#include "func2.inc"
#endif
```

[Workaround]

There is no workaround.

No.15 The dependence of include files when the assembler is activated by PM plus.

[Description]

In checking the dependence of include files described in assembler language when creating a make file in PM plus, only the deletion of comments and character strings is processed, and conditions such as \$if and \$_if are ignored.

[Phenomenon]

In the description example below, the #if, #else, and #endif lines are ignored. As a result, the existence of the file name specified by #include is checked regardless of whether the file is referenced or not. An error will occur if the file specified by #include does not exist when executing a build.

Example:

```
#if (SYM)
#include(func1.h)
#else
```

```
#include(func2.h)
#endif
```

[Workaround]

There is no workaround.

No.37 An A402 error is output in the linker if the source file name consists of 15 or more characters.

[Description]

An A402 error is output in the linker when the following two conditions are satisfied.

- (1) The source file name consists of 15 or more characters.
- (2) Debug information is not output by the assembler.

The output of debug information is not specified in any of the following cases.

- “Release Build” is selected in PM or PM plus.
- The “-nga -ng” option is specified in the assembler.

[Workaround]

Implement any of the following workarounds.

- (1) Change the name of the source file so that it includes less than 15 characters.
- (2) Select “Debug Build” in PM or PM plus, or specify the “-ga -g” option (specified by default) in the assembler.

Debug information output by the assembler does not affect the generated HEX file.

7. DOCUMENT CORRECTION

7.1 Changed Points in Structured Assembly Language User's Manual

The affected user's manual is as follows.

User's Manual	Version	Document Number
RA78K0 Assembler Package Structured Assembly Language ST78K0 V3.10 or Later	1st	U11789E

7.1.1 Maximum performance list

The value of the maximum length per line in **Table 1-1 Maximum Performance of Structured Assembler** on page 4 has been changed.

<Incorrect> Line length (not including LF or CR)	218 characters
<Correct> Line length (not including LF or CR)	512 characters

7.1.2 Reserved word symbols

SYMLEN, NOSYMLEN, CAP, and NOCAP have been deleted from the “Assembler control instructions” in **Table 2-5 Reserved Word Symbols** on page 14.

7.1.3 switch control statement

A description has been deleted from <2> in **[Description]** on page 27.

<Incorrect> If a break statement is not entered, a comparison instruction is executed for the next case statement.

Note with caution that operations following case processing differ from those in C-language programs. Enter a branch instruction to establish a function similar to a C program.

<Correct> If a break statement is not entered, a comparison instruction is executed for the next case statement.

7.1.4 Control instructions that can be entered only in module headers

The following control instructions have been deleted from **Table 6-1 Control Instructions that Can Be Entered Only in Module Headers** on page 134.

```
[Δ] $ [Δ] SYMLEN
[Δ] $ [Δ] NOSYMLEN
[Δ] $ [Δ] CAP
[Δ] $ [Δ] NOCAP
```

7.1.5 Control instruction list

\$SYMLEN and \$NOSYMLEN have been deleted from **Table 6-3 Control Instruction List** on page 136.

7.1.6 Control instructions for symbol name length

The symbol name length control instructions \$SYMLEN and \$NOSYMLEN on page 138 have been deleted.

7.1.7 Control instructions for symbol name length

\$SYMLEN and \$NOSYMLEN has been deleted from **Table A-5 Control Instructions** on page 144.

7.1.8 Maximum performance list

The value of the maximum length per line in **Table C-1 Maximum Performance of Structured Assembler** on page 155 has been changed.

<Incorrect> Line length (not including LF or CR) 218 characters

<Correct> Line length (not including LF or CR) 512 characters

7.2 Changed Points in Operation User's Manual

The affected user's manual is as follows.

User's Manual	Version	Document Number
RA78K0 Assembler Package Operation	1st	U17015E

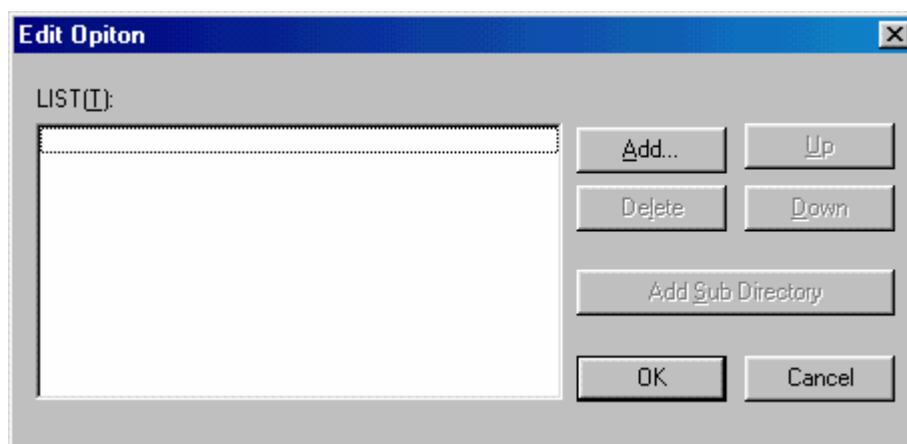
7.2.1 Path edit dialog box

Descriptions for when <Edit...> button of the following options is clicked have been added.

- Include Search Path specification in the Structured Assembler Options dialog box on page 82
- Include Search Path specification in the Assembler Options dialog box on page 127
- Library File specification in the Linker Options dialog box on page 178
- Library File Search Path specification in the Linker Options dialog box on page 178

<Addition>

- When the <Edit...> button is clicked, the <Edit Option> dialog box appears. The specified paths can be edited in the list in this dialog box.
- If multiple paths are specified, paths are listed from the path that is searched first.
- When the <Add...> button is clicked, the <Browse for Folder> dialog box appears and the selected path is added to the list. If there was already a path in the list, the new path is added at the top of the list.
- When the <Delete> button is clicked, the selected path is deleted from the list.
- When the <Up> or <Down> button is clicked, the selected path is moved up or down in the list.
- When the <Add Sub Directory> button is clicked, the sub-directory under the selected directory is added below the selected position.
- When the <OK> button is clicked, the list editing contents are reflected to the combo box.
- When the <Cancel> button is clicked, the list editing contents are not reflected to the combo box.



7.2.2 Symbol edit dialog box

Descriptions for when <Edit...> button of the following options is clicked have been added.

- Symbol Definition specification in the Structured Assembler Options dialog box on page 82
- Symbol Definition specification in the Assembler Options dialog box on page 128

<Addition>

- When the <Edit...> button is clicked, the <Edit Option> dialog box appears. The specified symbols can be edited in the list in this dialog box.
- When the <Add...> button is clicked, the <Add Option> dialog box appears and symbols to be added can be edited. If there was already a defined symbol in the list, the new symbol is added at the top of the list.
- When the <Delete> button is clicked, the selected symbol is deleted from the list.
- When the <Up> or <Down> button is clicked, the selected symbol is moved up or down in the list.
- When the <OK> button is clicked, the list editing contents are reflected to the combo box.
- When the <Cancel> button is clicked, the list editing contents are not reflected to the combo box.

