RL78 Development Environment Migration Guide

Migration between RL78 family (Compiler ed; Linker option) (CA78K0R to CC-RL)

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Introduction

- This document describes how to handle the options for the linkage editor and other build tools (ROMization processor, object converter, and variables/functions information file generator) when migrating projects created for the CA78K0R C compiler for the RL78 family of MCUs to the CC-RL C compiler for the RL78 family of MCUs.
- This document describes the CA78K0R C compiler for the RL78 family of MCUs and the CC-RL C compiler for the RL78 family of MCUs.
  The applicable versions are as follows.
  - CA78K0R V1.20 and later
  - CC-RL V1.03.00

Agenda

1. Linkage Editor Option Specifications

Differences in load module file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of a load module file.	-o	-output	
Does not output a load module file.	-no	—	CC-RL provides no option to stop output of a load module file.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in forced load module file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the forced output of a load module file.	-j	—	CC-RL provides no option to forcibly output a load module file.
Does not forcibly output a load module file.	-nj	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in debugging information output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Outputs debugging information to a load module file.	-g	-debug	
Does not output debugging information to a load module file.	-ng	-nodebug	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in debugging information output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Outputs debugging information to a load module file.	-g	-debug	
Does not output debugging information to a load module file.	-ng	-nodebug	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in symbol generation specification for resolving the stack

Item	Option		Actions
	CA78K0R	CC-RL	
Automatically generates public symbols to resolve the stack.	-s	—	__STACK_ADDR_START and __STACK_ADDR_END are generated by specifying the –device option. Refer to "Startup" in the user's manual.
Does not automatically generate public symbols to resolve the stack.	-ns	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in link directive file specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies a link directive file.	-d	—	Use the –start option to specify section allocation.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in link list file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of a link list file.	-p	-list	
Does not output a link list file.	-np	—	Delete the –list option setting.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in link list file information specification

Item	Option		Actions
	CA78K0R	CC-RL	
Outputs a map list to the link list file.	-km	-list	
Does not output a map list to the link list file.	-nkm	—	Delete the –list option setting.
Outputs a link directive file to the link list file.	-kd	—	CC-RL does not use the link directive file; no link directive information is output.
Does not output a link directive file to the link list file.	-nkd	—	
Outputs a public symbol list to the link list file.	-kp	-show =symbol	Specify this option together with the –list option.
Does not output a public symbol list to the link list file.	-nkp	—	Delete the -show=symbol option setting.
Outputs a local symbol list to the link list file.	-kl	-show =symbol	Specify this option together with the –list option.
Does not output a local symbol list to the link list file.	-nkl	—	Delete the -show=symbol option setting.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in link list file format specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the number of lines per page.	-ll	—	CC-RL provides no option to specify the format of the link list file to be output.
Outputs line feed codes.	-lf	—	Same as above.
Does not output line feed codes.	-nlf	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in error list file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of an error list file.	-e	—	CC-RL provides no option to specify the output of an error list file.
Does not output an error list file.	-ne	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in library file specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies a library file.	-b	-library	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in library file reading path specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the path from which a library file is to be read.	-i	—	Specify a file name with a path in the –library option.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in parameter file specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies a parameter file.	-f	-subcommand	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in temporary file generation path specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the path to where a temporary file is to be generated.	-t	—	Use environment variable "HLNK_TMP" to specify this.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in device file search path specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the path to where a device file is to be searched for.	-y	-device	Specify the device file name with a path in the –device option.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in warning message output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of warning messages to the console.	-w	-message -nomessage	These CC-RL options control the output of information-level messages.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in specification of boot-area ROM program linkage in the MCU having on-chip flash memory

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the start address of the flash memory area.	-zb	—	CC-RL provides no option to specify the start address of the flash area.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in on-chip debug specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the use of on-chip debug functions	-go	-ocdbg	This CC-RL option specifies the control value for the on-chip debug option bytes. The debug monitor area should be allocated separately using the –DEBUG_MONITOR option.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in security ID specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the security ID.	-gi	-security_id	

Refer to the user's manual for the compiler for more information and make changes as required.

Allocating the debug monitor area when enabling on-chip debug

When enabling the on-chip debug function, the debug monitor area should be allocated.

Specify the debug monitor area with the –DEBUG_MONITOR linkage editor option.

The following areas are filled with 0xFF.

1. On-chip debug monitor area (2 bytes from address 00002H)
2. Debug monitor area (10 bytes from address 000CEH)
3. Debug monitor area (512-byte area after the end address of code flash)

Differences in user option byte specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the value for the user option bytes.	-gb	-user_opt_byte	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in mirror area specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the area where the mirror source segment is allocated.	-mi	—	Use the -mirror_source option for the assembler.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in 64-Kbyte boundary allocation specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies segment allocation of the last byte at each 64-Kbyte area boundary (only for the assembler output files).	-ccza	—	Allocation at each 64-Kbyte area boundary cannot be specified. Allocate each section while taking special care regarding 64-Kbyte boundaries.
Specifies segment allocation of the last byte at each 64-Kbyte area boundary (including the compiler output files).	-nccza	—	Same as above.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in self-RAM area allocation control specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies limitation on allocation to the self-RAM area (outputs an error).	-self	-self	
Specifies limitation on allocation to the self-RAM area (outputs a warning).	-selfw	-selfw	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in trace RAM area allocation control specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies limitation on allocation to the trace RAM area (outputs an error).	-ocdtr	-ocdtr	
Specifies limitation on allocation to the trace RAM area (outputs a warning).	-ocdtrw	-ocdtrw	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in hot plug-in RAM area allocation control specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies limitation on allocation to the hot plug-in RAM area (outputs an error).	-ocdhpi	-ocdhpi	
Specifies limitation on allocation to the hot plug-in RAM area (outputs a warning).	-ocdhpiw	-ocdhpiw	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in specification of working area allocation for RRM/DMM function

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the working area address for the RRM/DMM function.	-rrm	-rrm	

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in copy routine address specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the address where the copy routine is to be allocated.	-rc	—	CC-RL provides no option to specify the address to allocate the copy routine. Refer to "ROMization" in the user's manual.

Refer to the user's manual for the compiler for more information and make changes as required.

Differences in ROMization area specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the address of the target area for ROMization.	-ra	—	CC-RL provides no option to specify the address of the target area for ROMization. Refer to "ROMization" in the user's manual.

Refer to the user's manual for the compiler for more information and make changes as required.

2. Other Tool Option Specifications

ROMization Processor Option Specifications
Differences in ROMization processor options

The CC-RL provides no options corresponding to the ROMization processor options.
For ROMization in the CC-RL, refer to "ROMization" in the user's manual.

Object Converter Option Specifications
Differences in object converter options

The object converter functions are integrated into the linkage editor functions in the CC-RL.

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in symbol table file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of a symbol table file.	-s	—	CC-RL provides no option to specify the output of a symbol table file.
Does not output a symbol table file.	-ns	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications

Differences in specification of object sorting in the address order

Item	Option		Actions
	CA78K0R	CC-RL	
Outputs hex-format objects in the address order.	-r	—	CC-RL provides no option to output hex-format objects in the address order.
Outputs hex-format objects in the order of their appearance in the load module file.	-nr	—	CC-RL provides no option to output hex-format objects in the order of their appearance in the module file.

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in object filling specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies a value to fill the area where no object is output.	-u	-space	
Does not fill the area where no object is output.	-nu	—	Delete the –space option setting.

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in error list file output specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of an error list file.	-e	—	CC-RL provides no option to specify the output of an error list file.
Does not output an error list file.	-ne	—	

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in parameter file specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies a parameter file.	-f	-subcommand	

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in hex format specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the Intel standard hex format.	-ki	—	CC-RL provides no option to specify the Intel standard hex format. Use the Intel extended hex format.
Specifies the Intel extended hex format.	-kie	-form =hexadecimal	
Specifies the extended tektronix format.	-kt	—	CC-RL provides no option to specify the extended tektronix format.
Specifies the Motorola S format.	-km	—	CC-RL provides no option to specify the Motorola S format that does not support 32-bit addresses. Use the 32-bit-address format.
Specifies the Motorola S format (32-bit address)	-kme	-form=stype	

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in device file search path specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the path to where a device file is to be searched for.	-y	-dev	Specify the device file name with a path in the –dev option.

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications

Differences in specification of separate file output for on-chip flash memory MCUs

Item	Option		Actions
	CA78K0R	CC-RL	
Outputs the boot area and other areas to separate files.	-zf	—	Specify the output ranges in the –output option to separate output areas. Example: -output=file1.hex=sec1:sec2,file2.hex=sec3

Refer to the user's manual for the compiler for more information and make changes as required.

Object Converter Option Specifications
Differences in CRC calculation specification

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the CRC calculation for hex-format objects.	-crc	-crc	

Refer to the user's manual for the compiler for more information and make changes as required.

Variables/Functions Information File Generator Option Specifications

Differences in variables/functions information file generator options

The CC-RL cannot generate a variables/functions information file.

Item	Option		Actions
	CA78K0R	CC-RL	
Specifies the output of a variables/functions information file.	-vo	-vfinfo	
Specifies the margin size for the saddr area.	-vs	—	CC-RL provides no option to specify the margin size for the saddr area.
Specifies the output of ROM/RAM usage information.	-vx	-total_size	Use the -total_size option.
Specifies the address where the copy routine is to be allocated.	-rc	—	CC-RL provides no option to specify the address to allocate the copy routine.
Specifies the address of the target area for ROMization.	-ra	—	CC-RL provides no option to specify the address of the target area for ROMization.

Refer to the user's manual for the compiler for more information and make changes as required.

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