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April 1st, 2010
Renesas Electronics Corporation

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M16C/60 Series and M16C/20 Series

General-purpose Program for Converting from ASCII to Hexadecimal Data

1. Abstract

This program converts ASCII code into hexadecimal data.

2. Introduction

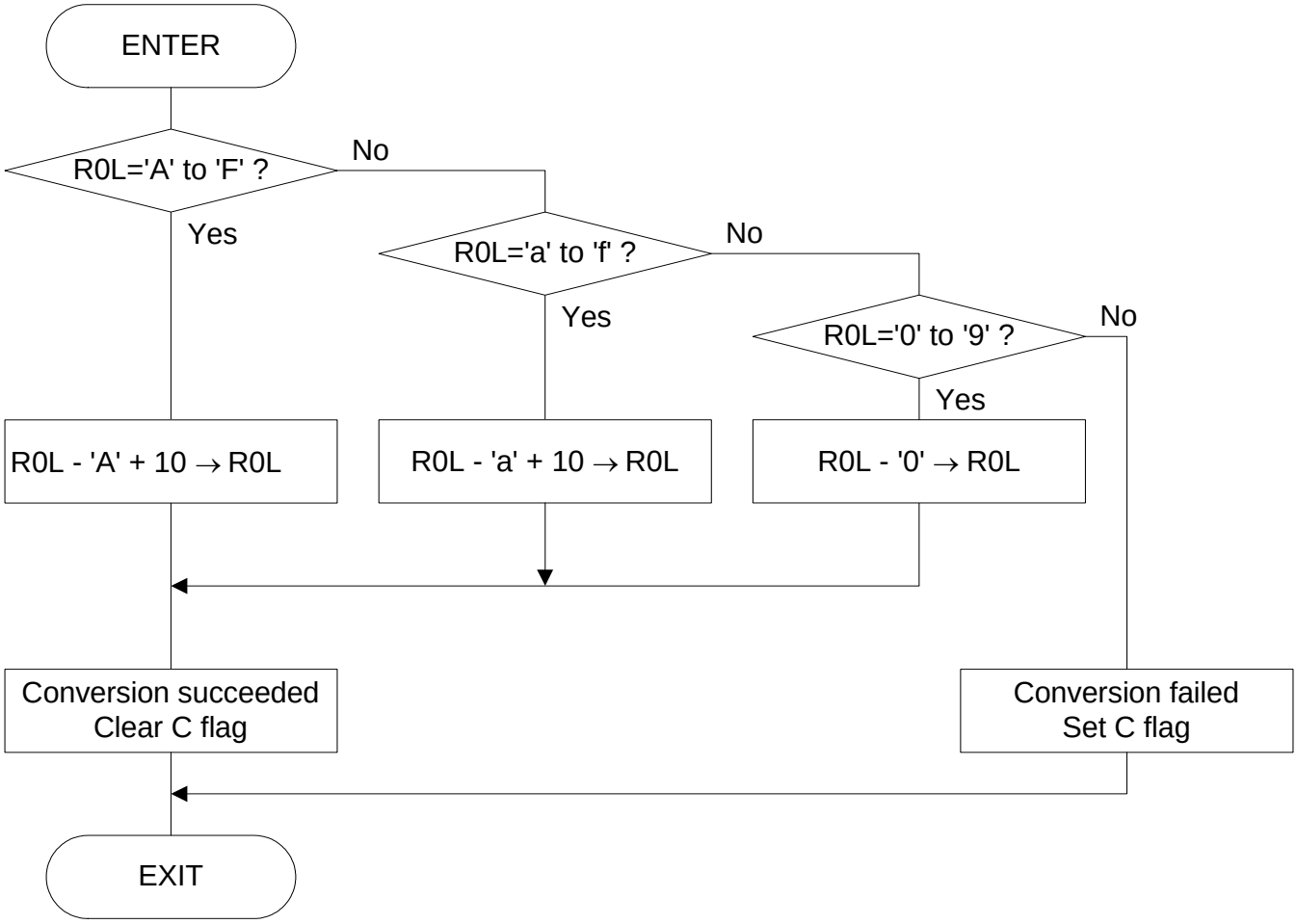
This program converts ASCII code into hexadecimal data. The ASCII code that can be converted are numbers from '0' to '9' and alphabets from 'a' to 'f' and 'A' to 'F'. Set ASCII code in R0L. The converted hexadecimal data is output to R0L. Conversion information is output to the C flag.

C	Meaning
0	ASCII converted into hexadecimal
1	Not converted because inconvertible code was input

Subroutine name : ATOH	ROM capacity : 42 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	ASCII code	Hexadecimal	←
R0H	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
C flag	-	Conversion information	←
Usage precautions			

3. Flowchart


ENTER
R0L='A' to 'F' ?
No
Yes
R0L='a' to 'f' ?
No
Yes
R0L='0' to '9' ?
No
Yes
R0L - 'A' + 10 → R0L
R0L - 'a' + 10 → R0L
R0L - '0' → R0L
Conversion succeeded
Clear C flag
Conversion failed
Set C flag
EXIT

4. The example of a reference program

```
;*********************************************************************
; *
; M16C General-purpose Programs *
; CPU : M16C *
; *
;*********************************************************************
VromTOP     .EQU     0F0000H             ; Declares start address of ROM
;                                        ;
;=============================================================
; Title     : Converting ASCII code into hexadecimal
; Contents of processing:
;             The ASCII code input in R0L is converted into hexadecimal data, which
;             is returned to R0L. The valid ASCII code are 0 to 9, A to F, and a to
;             f. No conversion is per-formed if invalid code is input.
; Procedure : (1) Input ASCII code in R0L.
;             (2) Call the subroutine.
;             (3) The converted hexadecimal data is loaded into R0L.
; Result : When converted into hexadecimal data, the C flag is cleared to 0. If not
;             converted into hexadecimal data, i.e., if any code other than 0 to 9,
;             A to F, or a to f was input, the C flag is set to 1.
; Input     : ------------------------------> Output:
; R0L (ASCII code)                R0L   (Hexadecimal)
; R0H ( )                         R0H   (Unused)
; R1 ( )                          R1    (Unused)
; R2 ( )                          R2    (Unused)
; R3 ( )                          R3    (Unused)
; A0 ( )                          A0    (Unused)
; A1 ( )                          A1    (Unused)
; Stack amount used: None
;=============================================================
            .SECTION    PROGRAM,CODE
            .ORG     VromTOP             ; ROM area
ATOH:                                    ;
   CMP.B       #'a',R0L                  ; ‘a’ or above?
   JLTU     ATOH10                       ; --> no
   CMP.B       #'f',R0L                  ; ‘f’ or below?
   JGTU     ATOH_ERR                     ; --> no (not converted)
   SUB.B       #(61H-10),R0L             ; SUB.B #'a'-10,R0L
   FCLR     C                           ; Sets “converted” information
   RTS                                  ;
ATOH10:                                  ;
   CMP.B       #'A',R0L                  ; ‘A’ or above?
   JLTU     ATOH20                       ; --> no
   CMP.B       #'F',R0L                  ; ‘F’ or below?
   JGTU     ATOH_ERR                     ; --> no (not converted)
   SUB.B       #(41H-10),R0L             ; SUB.B #'A'-10,R0L
   FCLR     C                           ; Sets “converted” information
   RTS                                  ;
```

```
ATOH20:                                 ;
   CMP.B       #'0',R0L                 ; ‘0’ or above?
   JLTU     ATOH_ERR                    ; --> no (not converted)
   CMP.B       #'9',R0L                 ; ‘9’ or below?
   JGTU     ATOH_ERR                    ; --> no (not converted)
   AND.B       #0FH,R0L                 ;
   FCLR     C                          ; Sets “converted” information
   RTS                                 ;
ATOH_ERR:                               ;
   FSET     C                          ; Sets “not-converted” information
   RTS                                 ;
;                                       ;
            .END                        ;
```

5. Reference

SOFTWARE MANUAL
M16C/60 M16C/20 Series SOFTWARE MANUAL
(Acquire the most current version from Renesas web-site)

6. Web-site and contact for support

Renesas Web-site

http://www.renesas.com

Contact for Renesas technical support

Mail to : support_apl@renesas.com

REVISION HISTORY

Rev.	Date	Description	
		Page	Summary
1.00	Jul 08, 2002	-	First edition issued

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