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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 Hexadecimal Data to ASCII Code

1. Abstract

This program converts hexadecimal data into ASCII code.

2. Introduction

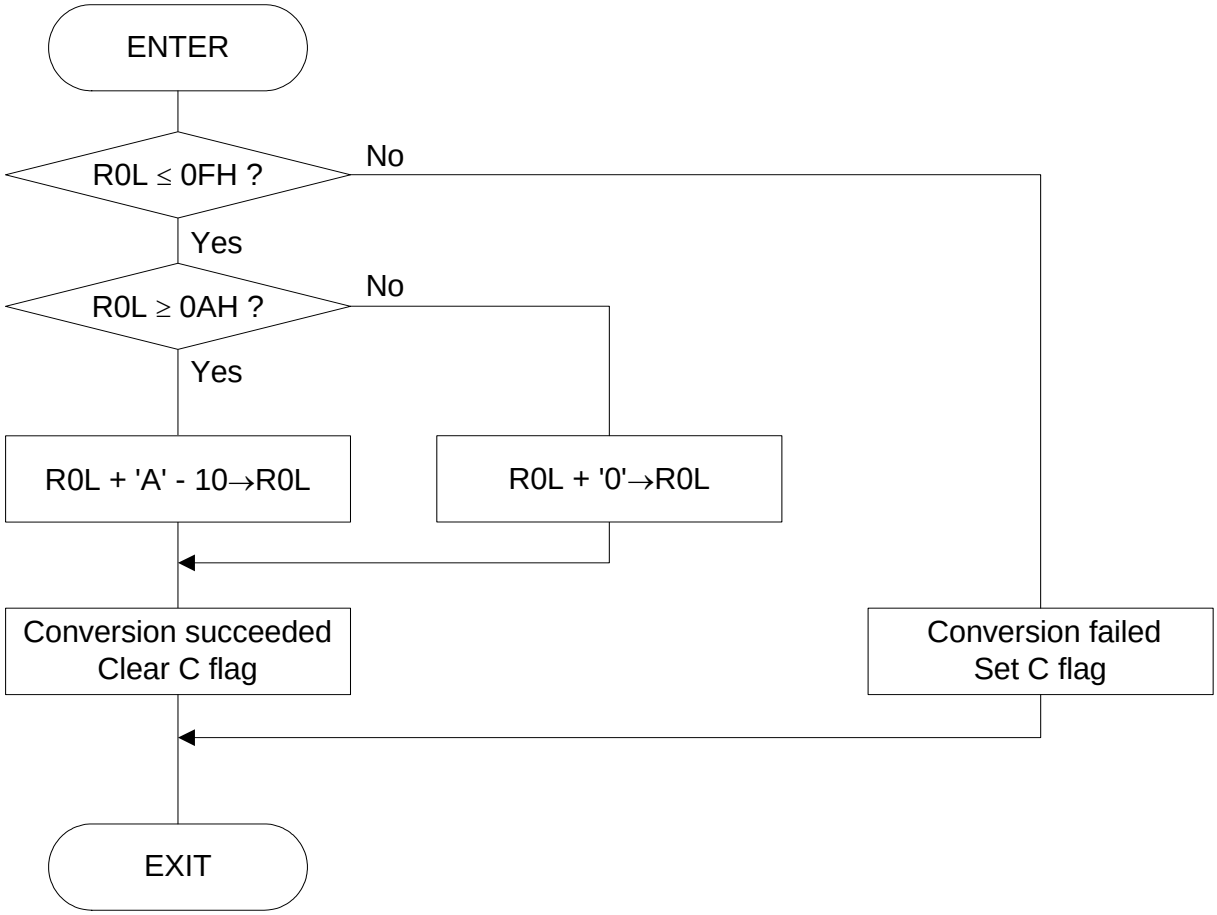
This program converts hexadecimal data into ASCII code. The hexadecimal data that can be converted are from “00H” to “0FH.” The converted ASCII code are numbers from ‘0’ to ‘9’ and alphabets from ‘A’ to ‘F’. Set the hexadecimal data in R0L. The converted ASCII code is output to R0L. Conversion information is output to the C flag.

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

Subroutine name : HTOA	ROM capacity : 21 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	Hexadecimal	ASCII code	←
R0H	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
C flag	-	Converted or not	←
Usage precautions			

3. Flowchart


ENTER
R0L ≤ 0FH ?
No
Yes
R0L ≥ 0AH ?
No
Yes
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 hexadecimal into ASCII code
; Contents of processing:
;             The hexadecimal data input in R0L is converted into ASCII code, which
;             is returned to R0L. The valid hexadecimal data are 00 to 0F. 0A to 0F
;             are converted into ‘A’ to ‘F.’ No conversion is performed if invalid code
;             is input.
; Procedure : (1) Input hexadecimal data in R0L.
;             (2) Call the subroutine.
;             (3) The converted hexadecimal data is loaded into R0L.
; Result : When converted into ASCII code, the C flag is cleared to 0. If not converted
;            into ASCII code, i.e., if any hexadecimal data other than 00 to 0F was
;            input, the C flag is set to 1.
; Input     : ------------------------------> Output:
; R0L (Hexadecimal)                R0L   (ASCII code)
; 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
HTOA:                                    ;
   CMP.B       #0FH,R0L                  ; 0F or below?
   JGTU     HTOA_ERR                     ; --> No(not converted)
   CMP.B       #0AH,R0L                  ; 0A or above?
   JGEU     HTOA10                       ; --> Yes (A to F set)
   OR.B     #'0',R0L                    ;
   FCLR     C                           ; Sets “converted” information
   RTS                                  ;
HTOA10:                                  ;
   ADD.B       #(41H-10),R0L             ; ADD.B #'A'-10,R0L
   FCLR     C                           ; Sets “converted” information
   RTS                                  ;
HTOA_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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