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H8/300L Series

Lowercase-to-Uppercase Conversion of ASCII Codes (TPR)

Introduction

1. The software TPR converts a lowercase ASCII code to a corresponding uppercase ASCII code.
2. All data used with the software TPR is ASCII code.

Target Device

H8/300L Series

Contents

1. Arguments

Description		Memory area	Data length (bytes)
Input	Lowercase ASCII code	R0L	1
Output	Uppercase ASCII code	R0L	1

2. Changes to Internal Registers and Flags

R0H	R0L	R1	R2	R3	R4	R5	R6	R7
×	↕	•	•	•	•	•	•	•

I	U	H	U	N	Z	V	C
•	•	×	•	×	×	×	×

•: No change
×: Undefined
↕: Result

3. Specifications

Program memory (bytes)
14
Data memory (bytes)
0
Stack (bytes)
0
Clock cycle count
24
Reentrant
Possible
Relocation
Possible
Interrupt
Possible

4. Description

4.1 Details of functions

1. The following argument is used with the software TPR:
   R0L: Sets a lowercase ASCII code as an input argument. After execution of the software TPR, the corresponding uppercase ASCII code is placed in R0L.
2. The following figure illustrates the execution of the software TPR. When the lowercase ASCII code 'a' (H'61) is set as shown in (1), it is converted to the uppercase ASCII code 'A' (H'41), which is then placed in R0L as shown in (2).

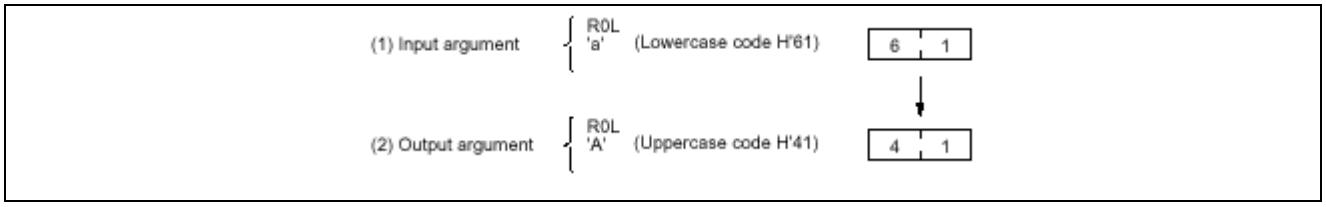


Figure 4.1 Example of Software TPR Execution

4.2 Note on usage

A lowercase ASCII code must be set in R0L. If any other code is placed in R0L, the input data is retained in R0L.

4.3 Data memory

The software TPR uses no data memory.

4.4 Example of use

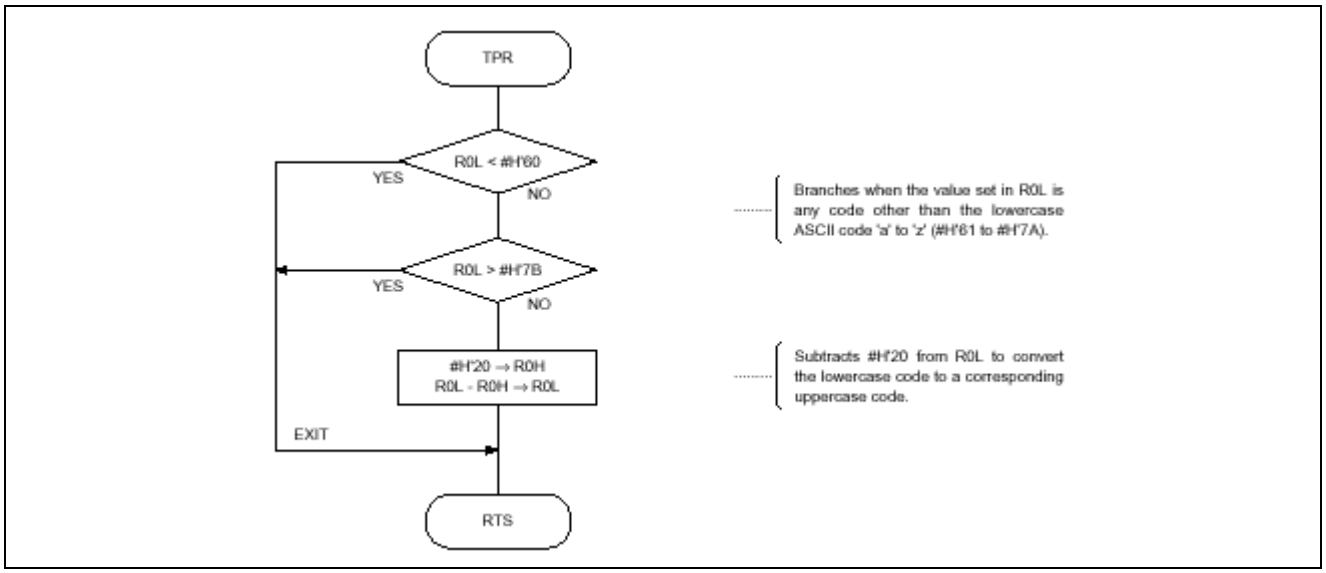
Set a lowercase ASCII code in the input argument and call the software TPR as a subroutine.

```
WORK1   .RES. B   1          ..... Reserves a data memory area in which the
                               user program places a lowercase ASCII
                               code.
WORK2   .RES. B   1          ..... Reserves a data memory area in which a
                               corresponding uppercase ASCII code is
                               placed in the user program.
        MOV. B    @WORK1, R0L ..... Places the lowercase ASCII code set by
                               the user program in the input argument.
        JSR       @TPR       ..... Calls the software TPR as a subroutine.
        MOV. B    R0, @WORK2 ..... Places the uppercase ASCII code set in
                               the output argument in the data memory
                               area of the user program.
```

4.5 Operation

1. Compare instruction (CMP.B) is used to determine whether the input data set in R0L is a lowercase ASCII code.
2. H'20 is subtracted from the lowercase ASCII code to obtain a corresponding uppercase ASCII code.
3. If the input data is not a lowercase ASCII code, the program retains the input data and terminates processing.

5. Flowchart


TPR
R0L < #H'60
YES
NO
R0L > #H'7B
YES
NO
#H'20 → R0H
R0L - R0H → R0L
EXIT
RTS
Branches when the value set in R0L is any code other than the lowercase ASCII code 'a' to 'z' (#H'61 to #H'7A).
Subtracts #H'20 from R0L to convert the lowercase code to a corresponding uppercase code.

6. Program List

```
*** H8/300 ASSEMBLER VER 1.0B ** 08/18/92 09:47:44
PROGRAM NAME =
 1                                          ;*******************************************************************************
 2                                          ;*
 3                                          ;*      00 - NAME               :CHANGE ASCII CODE LOWERCASE
 4                                          ;*                               TO UPPERCASE (TPR)
 5                                          ;*
 6                                          ;*******************************************************************************
 7                                          ;*
 8                                          ;*      ENTRY   :R0L (ASCII CODE LOWERCASE)
 9                                          ;*
10                                          ;*      RETURN  :R0L (ASCII CODE UPPERCASE)
11                                          ;*
12                                          ;*******************************************************************************
13                                          ;
14       TPR_code C       0000                      .SECTION                TPR_code,CODE,ALIGN=2
15                                                  .EXPORT                 TPR
16                                          ;
17       TPR_code C                00000000  TPR     .EQU $                  ;Entry point
18       TPR_code C       0000     A861              CMP.B   #H'61,R0L
19       TPR_code C       0002     4508              BCS     EXIT            ;Branch if R0L<#H'60
20       TPR_code C       0004     A87A              CMP.B   #H'7A,R0L
21       TPR_code C       0006     4204              BHI     EXIT            ;Branch if R0L>#H'7B
22       TPR_code C       0008     F020              MOV.B   #H'20,R0H
23       TPR_code C       000A     1808              SUB.B   R0H,R0L         ;Lowercase - #H'20 -> Uppercase
24       TPR_code C       000C              EXIT
25       TPR_code C       000C     5470              RTS
26                                          ;
27                                                  .END
*****TOTAL ERRORS 0
*****TOTAL WARNINGS 0
```

Revision Record

		Description	
Rev.	Date	Page	Summary
1.00	Sep.18.03	—	First edition issued

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