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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

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M16C/60 Series and M16C/20 Series

General-purpose Program for Compressing BCD

1. Abstract

This program converts 2-digit unpacked BCD data into 1-digit packed BCD.

2. Introduction

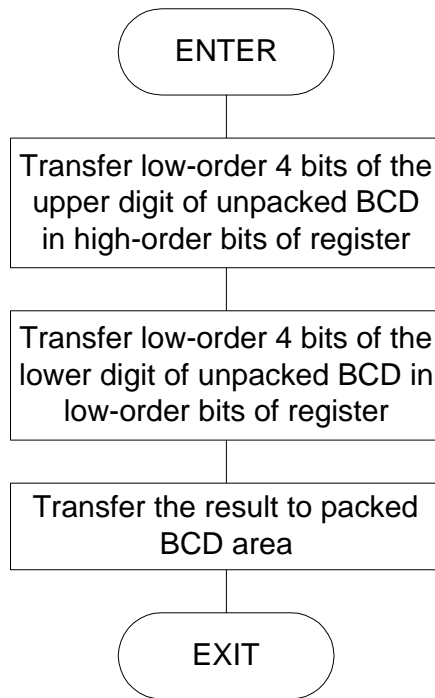
This program converts 2-digit unpacked BCD data into 1-digit packed BCD. Set the 2-digit unpacked BCD data in a variable area (UNPACK_BCDhi, UNPACK_BCDlow). When the program is executed, 1-digit packed BCD data is output to a variable area (PACK_BCD).

The program transfers the low-order 4 bits of the upper digit and the low-order 4 bits of the lower digit of the unpacked BCD in the high-order and the low-order bits of a data creation register by using a 4-bit manipulating instruction as it creates packed BCD.

Subroutine name : -	ROM capacity : 8 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	-	Packed BCD	Used to create data
R0H	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
UNPACK_BCDhi	Upper half of unpacked BCD	Does not change	←
UNPACK_BCDlow	Lower half of unpacked BCD	Does not change	←
PACK_BCD	-	Packed BCD	←
Usage precautions			

3. Flowchart



4. The example of a reference program

```

;*****
; *
; M16C General-purpose Programs *
; CPU : M16C *
; *
;*****
VramTOP   .EQU    000400H           ; Declares start address of RAM
VromTOP   .EQU    0F0000H           ; Declares start address of ROM
Vsb       .EQU    0400H             ; Sets SB
;
;               .SECTION    RAM,DATA
;               .ORG      VramTOP     ; RAM area
UNPACK_BCDhi: .BLKB    1             ; Upper digit of unpacked BCD
UNPACK_BCDlow: .BLKB   1             ; Lower digit of unpacked BCD
PACK_BCD:     .BLKB    1             ; Packed BCD
;
;=====
; Title       : Compressing BCD
; Outline     : Converts 2-digit unpacked BCD to 1-digit packed BCD.
; Input      : -----> Output:
; R0L ( )    R0L    (Packed BCD)
; R0H ( )    R0H    (Unused)
; R1L ( )    R1L    (Unused)
; R1H ( )    R1H    (Unused)
; R2 ( )    R2     (Unused)
; R3 ( )    R3     (Unused)
; A0 ( )    A0     (Unused)
; A1 ( )    A1     (Unused)
; Stack amount used: None
; Notes:
;=====
;               .SECTION    PROGRAM, CODE
;               .ORG      VromTOP     ; ROM area
;               .SB      Vsb         ; Declares SB register value
;               .SBSYM   UNPACK_BCDhi ;
;               .SBSYM   UNPACK_BCDlow ;
;               .SBSYM   PACK_BCD    ;
LDC        #Vsb,SB                ; Sets initial values for SB register
MOVLH     UNPACK_BCDhi,R0L         ;
MOVLL     UNPACK_BCDlow,R0L        ;
MOV.B     R0L,PACK_BCD             ;
;
;               .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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