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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 Changing Blocks

1. Abstract

This program changes memory contents consisting of the same number of bytes with each other memory location.

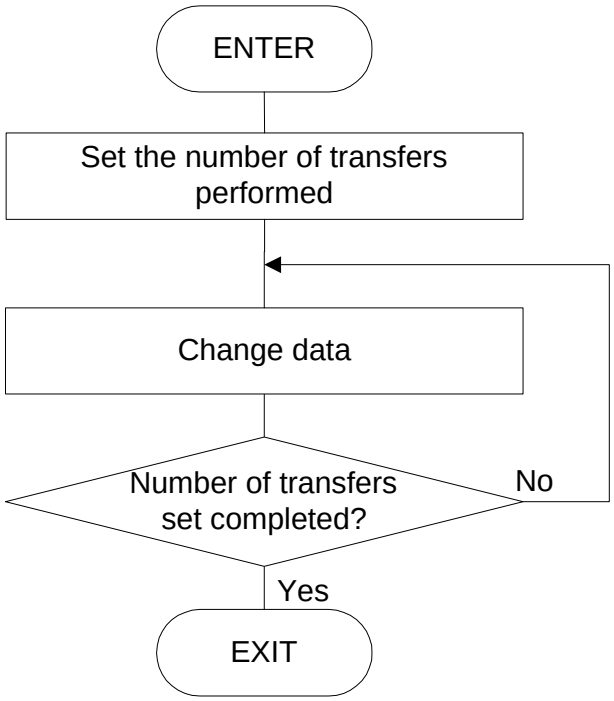
2. Introduction

This program changes memory contents consisting of the same number of bytes with each other memory location. An add and conditional branch instruction (ADJNZ) is used to count the number of transfers performed. In this program, memory contents basically are changed in bytes. However, if the memory contents to be changed consist of even bytes, they can be changed in words for increased speed of processing.

Subroutine name : -	ROM capacity : 17 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	-	Last data of BLOCK2	Register used for change
R0H	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	0000_{16}	Number of transfers performed
A1	-	-	Unused
BLOCK1	Content of BLOCK1	Content of BLOCK2	←
BLOCK2	Content of BLOCK2	Content of BLOCK1	←
Usage precautions	Memory contents are changed in bytes.		

3. Flowchart


ENTER
Set the number of transfers performed
Change data
Number of transfers set completed?
No
Yes
EXIT

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
;                                        ;
            .SECTION    RAM,DATA
            .ORG     VramTOP             ; RAM area
LENGTH         .EQU     10               ; Length of area
BLOCK1:     .BLKB       LENGTH           ; Area 1
BLOCK2:     .BLKB       LENGTH           ; Area 2
;                                        ;
;=============================================================
; Title     : Changing blocks
; Outline   : Changes data in units of blocks.
; Input     : ------------------------------> Output:
; R0L ( )                          R0L   (Indeterminate)
; R0H ( )                          R0H   (Unused)
; R1L ( )                          R1L   (Unused)
; R1H ( )                          R1H   (Unused)
; R2 ( )                           R2    (Unused)
; R3 ( )                           R3    (Unused)
; A0 ( )                           A0    (Indeterminate)
; A1 ( )                           A1    (Unused)
; Stack amount used: None
; Notes:
;=============================================================
            .SECTION    PROGRAM,CODE
            .ORG     VromTOP             ; ROM area
   MOV.B       #LENGTH,A0                ; Sets number of transfers performed
LOOP:                                    ;
   MOV.B       BLOCK1-1[A0],R0L          ;
   XCHG.B      R0L,BLOCK2-1[A0]          ; Changes data
   MOV.B       R0L,BLOCK1-1[A0]          ;
   ADJNZ.W  #-1,A0,LOOP                  ; --> Looped for the number of transfers
                                         ; performed
;                                        ;
            .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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