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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 Processing Bits

1. Abstract

This program processes bits.

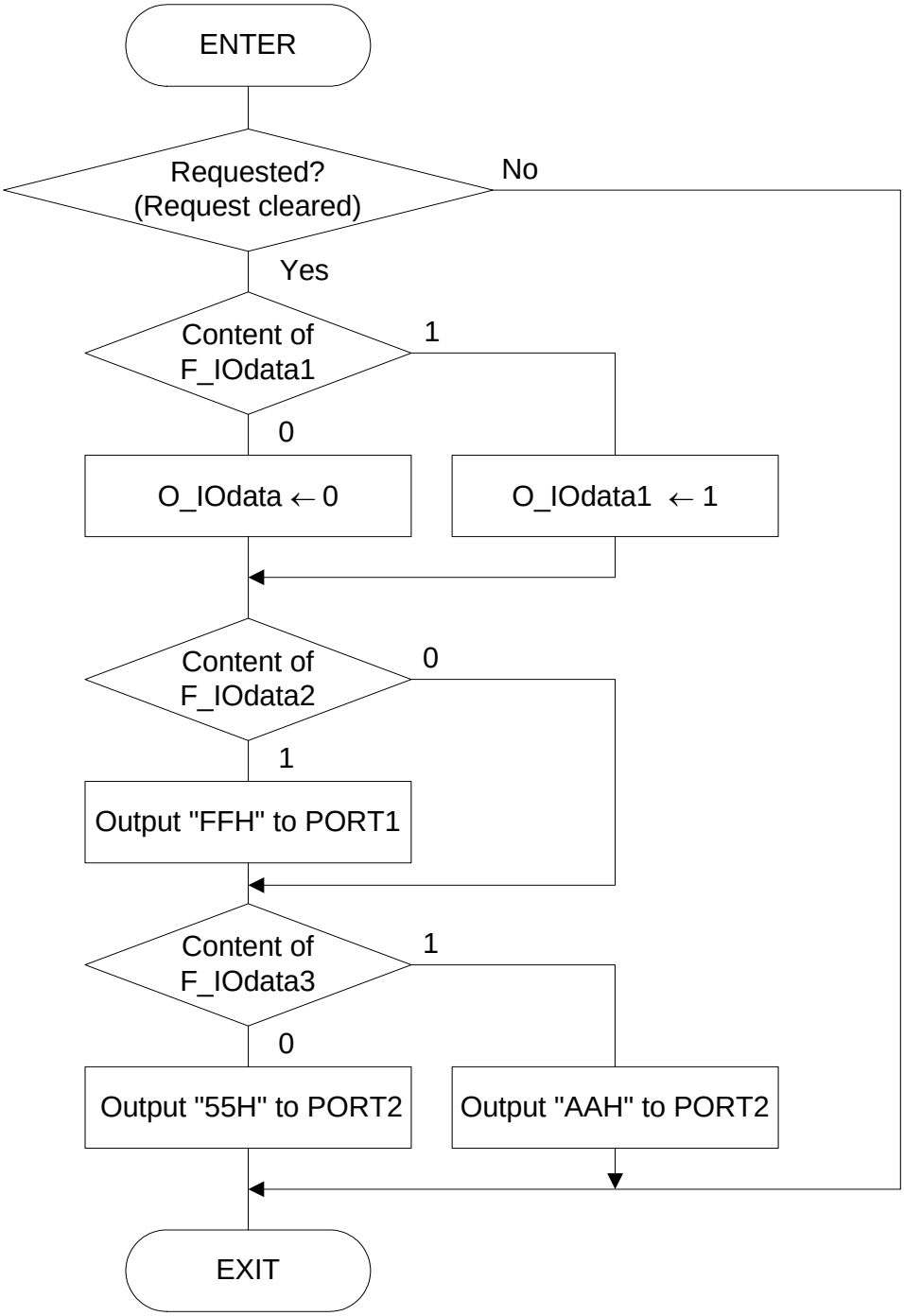
2. Introduction

This program uses bit processing instructions (BTSTC, BTST, BNTST) and condition store instructions (STNZ, STZX) to perform its function. When it is executed, a value is output to PORT1, or PORT2 that corresponds to the bit content of a variable area (FLAG1).

Subroutine name : -	ROM capacity : 32 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
Usage precautions			

3. Flowchart


ENTER
Requested?
(Request cleared)
No
Yes
Content of
F_IOdata1
1
0
O_IOdata ← 0
O_IOdata1 ← 1
Content of
F_IOdata2
0
1
Output "FFH" to PORT1
Content of
F_IOdata3
1
0
Output "55H" to PORT2
Output "AAH" to PORT2
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
                                         ; SFR area
PORT0          .EQU     003E0H           ; PORT0
O_IOdata1      .BTEQU      0,PORT0       ;
PORT1          .EQU     003E1H           ; PORT1
PORT2          .EQU     003E4H           ; PORT2
;                                        ;
            .SECTION    RAM,DATA
            .ORG     VramTOP             ; RAM area
FLAG1:         .BLKB       1            ;
F_REQ          .BTEQU      0,FLAG1      ; Output request flag
F_IOdata1      .BTEQU      1,FLAG1      ;
F_IOdata2      .BTEQU      2,FLAG1      ;
F_IOdata3      .BTEQU      3,FLAG1      ;
;                                        ;
;=============================================================
; Title     : Setting bit after accepting event
; Outline   : Outputs memory content only when requested by other process
; Input     : ------------------------------> Output:
; R0L ( )                          R0L    (Unused)
; 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
   BTSTC       F_REQ                     ; Confirms and clears request
   JEQ      BITsetEXIT                   ; --> No request
;
   BTST     F_IOdata1                    ; Checks memory content
   BMC      O_IOdata1                    ; Outputs memory content
;
   BNTST       F_IOdata2                 ; Checks memory content
   STNZ     #0FFH,PORT1                  ; Outputs “FF” if memory content = 1
;
   BTST     F_IOdata3                    ; Checks memory content
   STZX     #055H,#0AAH,PORT2            ; Outputs “55” : memory content = 0 ,
                                         ; “AA” : memory content = 1
BITsetEXIT:
;                                        ;
            .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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