Set GPIO Power-ON Status on M6117D Series

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Some applications need to set GPIO default status on M6117D series. This document will show user how to add initial codes in M6117D BIOS to do that. Those codes are run before BIOS POST. Refer this technical document for more information:

"**How to Use Free Space in AMI BIOS on M6117D Series ?**"

http://www.dmp.com.tw/tech/dmp-hw/bios/Use_Free_Space_in_AMI_BIOS_on_M6117D.pdf

Get BIOS ROM Image

BIOS ROM image can be read from EEPROM writer. For example: read a 128Kbytes BIOS ROM image from ICOP-6026 BIOS flash from EEPROM writer and save it as **6026.rom**. If you have no EEPROM writer or have trouble about getting BIOS ROM Image, mail tech@dmp.com.tw to get help.

Modify BIOS to Add Initial Codes

Suppose we want to set all GPIO pins to low at power-on. We have to add those codes:

```
mov al,13
out 22,al
mov al,c5
out 23,al
mov al,4e
out 22,al
mov al,ff
out 23,al
mov al,47
out 22,al
mov al,00
out 23,al
mov al,4f
out 22,al
mov al,ff
out 23,al
mov al,4d
out 22,al
mov al,00
out 23,al
mov al,13
out 22,al
mov al,00
```

```
out 23,al
```

Those codes are set GPIO as output mode and set output pins to low. Refer this document to get more information:
"**How to Use GPIO on M6117D ?**"
http://www.dmp.com.tw/tech/dmp-hw/cpu-m6117d/Use_M6117D_GPIO.pdf

We will do this demo at DOS debug command. See our demonstration:

1. Load BIOS image.

```
C:\>debug
-n 6026.rom
-l 2000:0
```

2. Find "FF E5" (JMP BP) to add our codes. Because first 64Kbytes is VGA BIOS, we find "FF E5" at second 64KB.

```
-u 3000:0
3000:0000 B00A          MOV    AL,0A
3000:0002 E670          OUT    70,AL
3000:0004 E471          IN     AL,71
3000:0006 2470          AND    AL,70
3000:0008 3C20          CMP    AL,20
3000:000A 7564          JNZ    0070
3000:000C B00A          MOV    AL,0A
3000:000E E670          OUT    70,AL
3000:0010 E471          IN     AL,71
3000:0012 A880          TEST   AL,80
3000:0014 75F6          JNZ    000C
3000:0016 B000          MOV    AL,00
3000:0018 E670          OUT    70,AL
3000:001A E471          IN     AL,71
3000:001C 3C59          CMP    AL,59
3000:001E 7750          JA     0070
-u
3000:0020 B00A          MOV    AL,0A
3000:0022 E670          OUT    70,AL
3000:0024 E471          IN     AL,71
3000:0026 A880          TEST   AL,80
3000:0028 75F6          JNZ    0020
3000:002A B002          MOV    AL,02
3000:002C E670          OUT    70,AL
3000:002E E471          IN     AL,71
3000:0030 3C59          CMP    AL,59
```

```
3000:0032 773C      JA      0070
3000:0034 B00A      MOV     AL,0A
3000:0036 E670      OUT     70,AL
3000:0038 E471      IN      AL,71
3000:003A A880      TEST    AL,80
3000:003C 75F6      JNZ     0034
3000:003E B004      MOV     AL,04
-u
3000:0040 E670      OUT     70,AL
3000:0042 E471      IN      AL,71
3000:0044 3C23      CMP     AL,23
3000:0046 7728      JA      0070
3000:0048 B00A      MOV     AL,0A
3000:004A E670      OUT     70,AL
3000:004C E471      IN      AL,71
3000:004E A880      TEST    AL,80
3000:0050 75F6      JNZ     0048
3000:0052 B006      MOV     AL,06
3000:0054 E670      OUT     70,AL
3000:0056 E471      IN      AL,71
3000:0058 3C31      CMP     AL,31
3000:005A 7714      JA      0070
3000:005C B00A      MOV     AL,0A
3000:005E E670      OUT     70,AL
-u
3000:0060 E471      IN      AL,71
3000:0062 A880      TEST    AL,80
3000:0064 75F6      JNZ     005C
3000:0066 B008      MOV     AL,08
3000:0068 E670      OUT     70,AL
3000:006A E471      IN      AL,71
3000:006C 3C12      CMP     AL,12
3000:006E 7616      JBE     0086
3000:0070 B409      MOV     AH,09
3000:0072 8AC4      MOV     AL,AH
3000:0074 E670      OUT     70,AL
3000:0076 B001      MOV     AL,01
3000:0078 E671      OUT     71,AL
3000:007A FECC      DEC     AH
3000:007C 75F4      JNZ     0072
3000:007E B00A      MOV     AL,0A
```

```
-u
3000:0080 E670        OUT    70,AL
3000:0082 B024        MOV    AL,24
3000:0084 E671        OUT    71,AL
3000:0086 FFE5        JMP    BP
3000:0088 0000        ADD    [BX+SI],AL
3000:008A 0000        ADD    [BX+SI],AL
3000:008C 0000        ADD    [BX+SI],AL
3000:008E 0000        ADD    [BX+SI],AL
3000:0090 0000        ADD    [BX+SI],AL
3000:0092 0000        ADD    [BX+SI],AL
3000:0094 0000        ADD    [BX+SI],AL
3000:0096 0000        ADD    [BX+SI],AL
3000:0098 0000        ADD    [BX+SI],AL
3000:009A 0000        ADD    [BX+SI],AL
3000:009C 0000        ADD    [BX+SI],AL
3000:009E 0000        ADD    [BX+SI],AL
```

3. "FF E5" is at 3000:0086. So we add our initial codes at this address. Remember to add "JMP BP" at end of your initial codes.

```
-a 3000:0086
3000:0086 mov al,13
3000:0088 out 22,al
3000:008A mov al,c5
3000:008C out 23,al
3000:008E mov al,4e
3000:0090 out 22,al
3000:0092 mov al,ff
3000:0094 out 23,al
3000:0096 mov al,47
3000:0098 out 22,al
3000:009A mov al,00
3000:009C out 23,al
3000:009E mov al,4f
3000:00A0 out 22,al
3000:00A2 mov al,ff
3000:00A4 out 23,al
3000:00A6 mov al,4d
3000:00A8 out 22,al
3000:00AA mov al,00
3000:00AC out 23,al
```

```
3000:00AE mov al,13
3000:00B0 out 22,al
3000:00B2 mov al,00
3000:00B4 out 23,al
3000:00B6 jmp bp
3000:00B8
-
```

4. Save new image to another file "**new.rom"**.

```
-n new.rom
-w
Writing 20000 bytes
-q
C:\>
```

Update New ROM Image

Now use EEPROM writer or our Flash EPROM programming utility (mail to tech@dmp.com.tw to get it) to update your BIOS. Your initial codes will run before BIOS at power-on. For this case, remember to set GPIO as output mode in BIOS. If GPIO is set to input mode, the GPIO status will be set to high at BIOS booting procedure. If GPIO input mode is needed, set its mode at your program start up.

Technical Support

For more technical support, please visit http://www.dmp.com.tw/tech or mail to tech@dmp.com.tw.