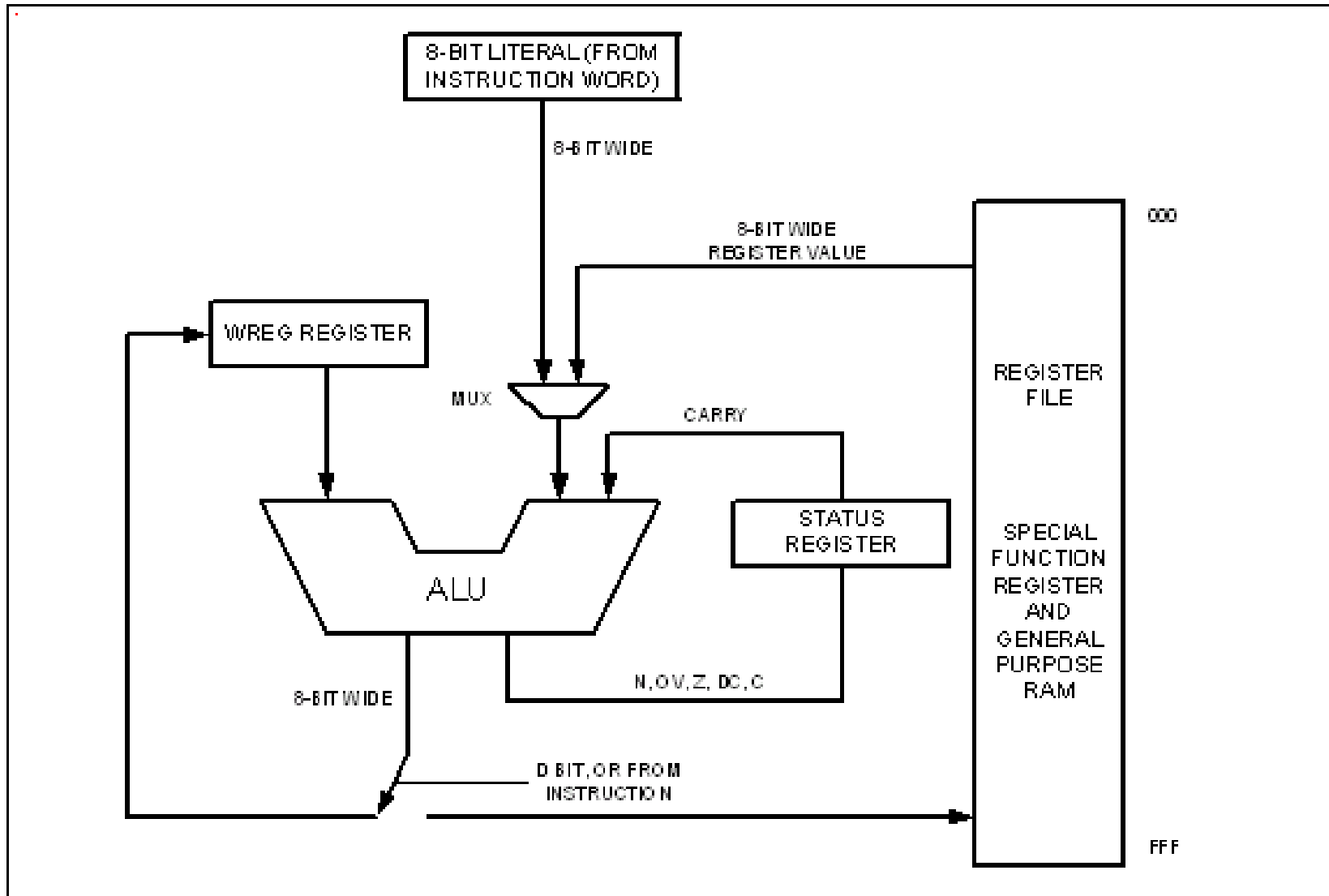




PIC File Register Instructions

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WREG, fileReg, and ALU in PIC18



ALU instructions using WREG and fileReg

Table 2-2: ALU Instructions Using Both WREG and fileReg

Instruction		
ADDWF	fileReg, d	ADD WREG and fileReg
ADDWFC	fileReg, d	ADD WREG and fileReg with Carry
ANDWF	fileReg, d	AND WREG with fileReg
IORWF	fileReg, d	OR WREG with fileReg
SUBFWB	fileReg, d	Subtract fileReg from WREG with borrow
SUBWF	fileReg, d	Subtract WREG from fileReg
SUBWFB	fileReg, d	Subtract WREG from fileReg with borrow
XORWF	fileReg, d	Exclusive-OR WREG with fileReg

ADDWF instruction

- ADDWF fileReg, d
 - Add the contents of WREG and a file register
 - Destination, d
 - If d=0, result is placed in WREG
 - If d=1, result is placed in file register

- Ex1

```
MOVLW 28H
MOVWF 5H
MOVLW 56H
ADDWF 5H, 0    or  ADDWF 5H, 1
(ADDWF 5H, W  or  ADDWF 5H, F)
```

File register instructions

Table 2-3: File Register Instructions Using fileReg or WREG as Destination

Instruction		
COMF	fileReg, d	Complement fileReg
DECF	fileReg, d	Decrement fileReg
DECFSZ	fileReg, d	Decrement fileReg and skip if zero
DECFSNZ	fileReg, d	Decrement fileReg and skip if not zero
INCF	fileReg, d	Increment fileReg
INCFSZ	fileReg, d	Increment fileReg and skip if zero
INCSNZ	fileReg, d	Increment fileReg and skip if not zero
MOVF	fileReg, d	Move fileReg
NEGF	fileReg, d	Negative fileReg
RLCF	fileReg, d	Rotate left fileReg through carry
RLNCF	fileReg, d	Rotate left fileReg (No carry)
RRCF	fileReg, d	Rotate right fileReg through carry
RRNCF	fileReg, d	Rotate right fileReg (No carry)
SWAPF	fileReg, d	Swap nibbles in fileReg
BTG	fileReg, d	Bit Toggle fileReg

COMF instruction

- Complements (inverts) the content of file register

- Ex1

```
MOVLW 55H
```

```
MOVWF PORTB
```

```
COMF PORTB, F ; 55H (01010101) → AAH (10101010)
```

- Write a program to toggle PORTB continuously forever

Ans:

```
MOVLW 55H
```

```
MOVWF PORTB
```

```
B1 COMF PORTB, F
```

```
GOTO B1
```

DECF instruction

- Subtract one from the content of fileReg

- Ex1

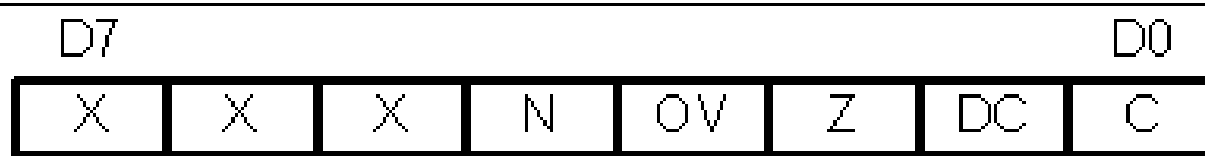
```
MOVLW 3
```

```
MOVWF 20H
```

```
DECF 0x20, F ; loc 20H has 2
```

```
DECF 0x20, W ; loc 20H still has 2 but WREG = 1
```

PIC18 status register



C – Carry flag **(Carry from D7 bit during an ADD or SUB operation)**

DC – Digital Carry flag **(Carry from D3 to D4 bit)**

Z – Zero flag **(Binary coded decimal (BCD) operation)**

OV – Overflow flag **(for signed number operation)**

N – Negative flag **(for signed number operation)**

X – D5, D6, and D7 are not implemented,
and reserved for future use.

Instruction that affect flag bits

Instruction	C	DC	Z	OV	N
ADDLW	X	X	X	X	X
ADDWF	X	X	X	X	X
ADDWFC	X	X	X	X	X
ANDLW			X		X
ANDWF			X		X
CLRF			X		
COMF			X		X
DAW	X				
DECF	X	X	X	X	X
INCF	X	X	X	X	X
IORLW			X		X
IORWF			X		X
MOVF			X		
NEGF	X	X	X	X	X
RLCF	X		X		X
RLNCF			X		X
RRCF	X		X		X
RRNCF			X		X
SUBFWB	X	X	X	X	X
SUBLW	X	X	X	X	X
SUBWF	X	X	X	X	X
SUBWFB	X	X	X	X	X
XORLW			X		X
XORWF			X		X

Note: X can be 0 or 1.

Reference

- M.A. Mazidi, R.D. Mckinlay, D Causey, PIC Microcontroller and Embedded Systems Using Assembly and C for PIC18, Pearson Education Inc., 2008.
- Han-Way Huang, PIC Microcontroller: An Introduction to Software and Hardware Interfacing, Thomson Delmar Learning, 2005.