PICmicro Information

The PICmicro programs include 'equate' statements that define the following labels:

Register	Description
PORTA	input / output port A
PORTB	input / output port B
TRISA	the control register for port A *
TRISB	the control register for port B *
STATUS	the status register
INTCON	the interrupt control register

these registers are on memory page 1

Constant	Description
W	result into working register (h'00')
F	result into file register (h'01')
RP0	register page selection bit
C	the carry flag STATUS bit
Z	the zero flag STATUS bit
GIE	the global interrupt controller bit
INT0IE	the external interrupt enable bit
INT0IF	external interrupt occurred flag bit

Pinout for 16F88 PICmicro IC:
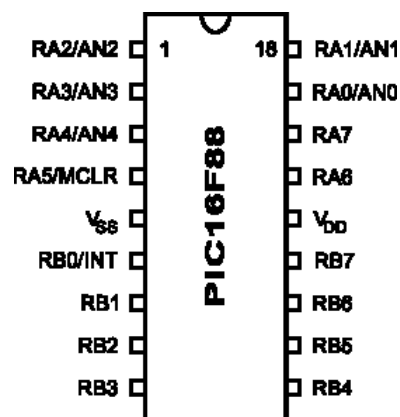
List of commands:

Mnemonic	Operands	Description
addlw	k	Add working register to literal k (k + WREG)
andlw	k	AND working register with literal k (k & WREG)
bcf	f, b	Bit clear in file register (file register f, bit b)
bsf	f, b	Bit set in file register (file register f, bit b)
btfsc	f, b	Bit test in file register, skip if clear (file register f, bit b)
btfss	f, b	Bit test in file register, skip if set (file register f, bit b)
call	label	Call subroutine at label
clrf	f	Clear file register f
comf	f, d	Complement f (to itself if d = 1, or working register if d = 0)
decfsz	f, d	Decrement f, skip if zero (to itself if d = 1, or working register if d = 0)
goto	label	Unconditional branch to label
incf	f, d	Increment file register f (to itself if d = 1, or working register if d = 0)
iorlw	k	Inclusive OR working register with literal (k | WREG)
movf	f, d	Move f (to itself if d = 1, or working register if d = 0)
movlw	k	Move literal to working register
movwf	f	Move working register to file register f
nop	-	No operation
retfie	-	Return from interrupt service routine and set global interrupt enable bit GIE
return	-	Return from subroutine
sublw	k	Subtract working register from literal k (k – WREG)

Number system notation

Decimal	d'153'
Hex	h'20' or 0x20
Binary	b'10010110' or 0b10010110

Structure of the INTCON register

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
GIE	PEIE	TMR0IE	INT0IE	RBIE	TMR0IF	INT0IF	RBIF

Structure of the STATUS register

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IRP	RP1	RP0	$\overline{TO}$	$\overline{PD}$	Z	DC	C

Extension PICAXE material for project work (not part of syllabus)

Instruction Set

The full Microchip MPASM instruction set is supported.

Pre-defined general purpose registers

The following byte registers are available for general use - B0 to B27. They are assumed to be on memory page 0. Registers and constants can be renamed using EQU e.g.

```
wSave EQU B20
```

Assumed sub-routines for project work.

For PICAXE project work use the following sub-routines are assumed predefined to make 'real-life' project work easier.

```
call wait1ms        ; delay 1 millisecond
call wait10ms       ; delay 10 milliseconds
call wait100ms      ; delay 100 milliseconds
call wait1000ms     ; delay 1000 milliseconds
call readadc0       ; read analogue value on A.0 and copy into b0
call readadc1       ; read analogue value on A.1 and copy into b1
call readadc2       ; read analogue value on A.2 and copy into b2
call readtemp0      ; read DS18B20 temperature value on A.0 and copy into b0
call readtemp1      ; read DS18B20 temperature value on A.1 and copy into b1
call readtemp2      ; read DS18B20 temperature value on A.2 and copy into b2
call debug          ; upload byte register (B0-B27) values to computer screen
call lcd            ; send byte value in working register out of pin B.0 to
                    ; LCD at 2400,N,8,1
```