servo2.c – PIC servo duty cycle generator pseudo code

clarification: this code is used to run 5 servo motors (1ms → 2ms pulses with a frequency of around 50Hz) off of one output compare. This was done to avoid using multiple PICS on the boat.

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module function prototypes

```
// initialize timer module for using servos
void init_servos(void);

// change duty of each servo
void setDuty(ServoChannel_t chan, unsigned char duty);
```

global variables

```
unsigned int g_duty[NUM_CHANNELS];     // NUM_CHANNELS = 5
char g_servoPortState[NUM_CHANNELS+1];
```

private functions

```
static unsigned int calculateTicksThrottle(unsigned char duty);
static unsigned int calculateTicks(unsigned char duty);
```

```
void init_servos(void)
        set Timer1 prescale values (prescale by 8)      // T1CON = 0x30
        set output compare                              // CCP1CON = 0x0A
        enable software interrupt from ccp1             // CCP1IE = 1
        clear interrupt flag                            // CCP1IF = 0
        enable timer1                                   // TMR1ON = 1;
end init_servos
```

```
void setDuty(ServoChannel_t chan, unsigned char duty)
        if (chan == throttle channel)                   // if chan == CHANNEL5
                g_duty[chan] = calculateTicksThrottle(duty)
        end if
        else
                g_duty[chan] = calculateTicks(duty)
        end else
end setDuty
```

---

static unsigned int calculateTicksThrottle(unsigned char duty)

// NOTE: timer1 period is 105 ms, we want somewhere between 1ms and 2ms high times

convert duty (0 → 255) to 1 to 2ms pulse in ticks

// ticks = (125*(unsigned int)duty)/51 + 625; this is the conversion

return ticks;

end calculateTicksThrottle

---

static unsigned int calculateTicks (unsigned char duty)

// NOTE: timer1 period is 105 ms, we want somewhere between 0.8ms and 2.4ms high times

convert duty (0 → 255) to 0.8 to 2.4ms pulse in ticks

// ticks = (200*(unsigned int)duty)/51 + 500; this is the conversion

return ticks;

end calculateTicks
