

Determine device configuration bits and UART configuration assuming:

- 1) Using internal Fast RC oscillator.
- 2) using PLL mode for oscillator.
- 3) Baud rate of 115200 bps.

Device configuration bits:

FNOSC\_PRCPLL

\* Requires software to configure CLKDIV

UART Configuration:

$$F_{cy} = \frac{(\overset{PRC}{8000000} * \overset{PLL}{4}) / \overset{Fosc/2}{2}}{1}$$

$$= 16000000$$

BRGH = 0

$$UxBRG = \frac{16000000}{16 * 115200} - 1$$

$$= 7.68$$

$$\approx \underline{\underline{7}}$$

\* Will lead to error:

$$\text{Actual Baud Rate} = \frac{16000000}{16(7+1)}$$

$$= 125000$$

$$\text{Baud Rate Error} = \underline{\underline{6.5\%}}$$

BRGH = 1

$$UxBRG = \frac{16000000}{4 * 115200} - 1$$

$$= 33.72$$

$$\approx \underline{\underline{33}}$$

\* Will lead to error:

$$\text{Actual Baud Rate} = \frac{16000000}{4(33+1)}$$

$$= 117647.06$$

$$\text{Baud Rate Error} = \underline{\underline{2.1\%}}$$

// Send command using UART2 and wait until it's safe  
 // to transmit another command.

```
void SendCommand(char cmd) {
```

```
    U2TXREG = cmd;
    while (IFS1bits.U2TXIF == 0);
    IFS1.U2TXIF = 0;
```

```
}
```

// Wait until an acknowledge (not not acknowledge) is received  
 // using UART2. Return 1 for acknowledge, 0 otherwise

```
int WaitForAcknowledge() {
```

```
    char receivedChar;
```

```
    while (IFS1bits.U2RXIF == 0);
    IFS1bits.U2RXIF = 0;
    receivedChar = U2RXREG;
    if (receivedChar == 0x06) return 1;
    return 0;
```

```
}
```

Send Command Requirements:

UTXISEL = 00

↓

- Sets U2TXIP when character transferred to TSR.
- Implies at least one entry is free within transmit buffer
- Safe to send another character

Wait For Acknowledge Requirements:

URXISEL = 0

- Sets U2RXIP when character is transferred to receive buffer
- Implies at least one character has been received and can be read from RXREG