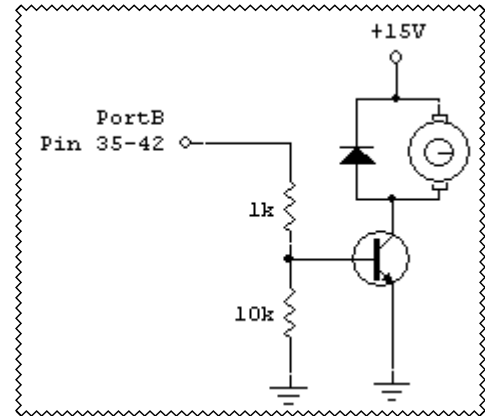


ET 386L
Lab 11 D.C. Motors, Pulse Width Modulation

1. Connect the following circuit:



2. Create, assemble, make appropriate comments and save the following programs:

```

        ORG    $0120
FAST    NOP
        LDAA   #$FF
        STAA   $1004      ;Address of Port B for output
        LDX    #$0C80
HIGH1   DEX
        BNE    HIGH1
        LDAA   #$00
        STAA   $1004
        LDX    #$029B
LOW1    DEX
        BNE    LOW1
        RTS

        ORG    $0130
SLOW    NOP
        RTS

        ORG    $0100      ;Main Body
SPIN    NOP
        JSR    FAST
*       JSR    SLOW *
        JMP    SPIN
        END
```

3. Complete the “Slow” subroutine. “REM” out the “FAST” subroutine, execute the program using only the “SLOW” subroutine and observe the results.

4. Connect the switch assembly to the EVBU and execute the following program:

```

Watch  ORG    $0100
        LDAB  $100A ;Main body
        CMPB  #$01 ;first logical decision
        BEQ   Fast ;
        CMPB  #$80 ;second logical decision
        BEQ   Slow ;
        JMP   Watch ;

Fast    ORG    $0130
        NOP    ;Fast subroutine
        LDAA  #$FF ;
        STAA  $1004 ;
        LDX   #$0C80 ;

High1   DEX
        BNE   High1
        LDAA  #$00 ;
        STAA  $1004 ;
        LDX   #$029B ;

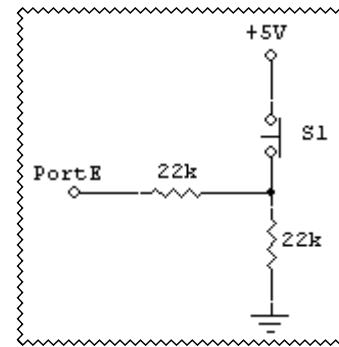
Low1    DEX
        BNE   Low1 ;
        JMP   Watch ;

Slow    ORG    $0150
        NOP    ;Slow subroutine
        LDAA  #$FF ;
        STAA  $1004 ;
        LDX   #$029B ;

High2   DEX
        BNE   High2 ;
        LDAA  #$00 ;
        STAA  $1004 ;
        LDX   #$0C80 ;

Low2    DEX
        BNE   Low2 ;
        JMP   Watch ;
        END

```



Typical Switch Assembly

5. Modify the previous program so that 3 speeds are created.