

ET 386L  
Lab 6 Output Operations, Machine Cycles

1. Assemble the following circuit:

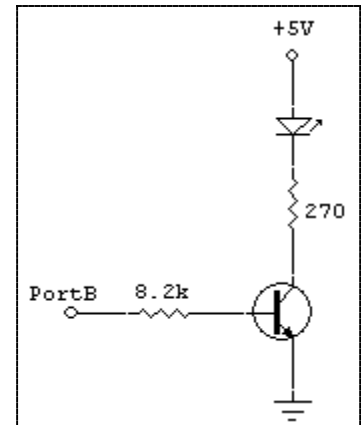
2. Create, assemble, make appropriate comments and save the following program:

```
      ORG    $0100    ;
REP   LDAA   #$01     ;
      STAA   $1004    ;
      LDX    #$FFFF   ;

HIGH  DEX     ;
      BNE    HIGH     ;

      LDAA   #$00     ;
      STAA   $1004    ;
      LDX    #$FFFF   ;

LOW   DEX     ;
      BNE    LOW      ;
      JMP    REP      ;
      END
```



Typical circuit for 8 LED  
Array Connected to Port B

3. This program is similar to Lab 5 but must be executed normally.

4. Modify the program as follows:

- a. Insert two NOP commands inside both the HIGH and LOW loops.
- b. Calculate the machine cycles, period and frequency for the modified loops. Refer to the complete instruction set in the reference manual to find the machine cycles for each command.
- c. Modify the program to produce the following pattern: