# ET-386 Lab 15 Port D

68HC11 Communication Lab - TX (Transmit) and RX (Receive) Lab for use with MiniIDE

This lab requires the use of two computers. One computer will act as the Transmitter and the other computer will behave as the Receiver of the message. Additionally, two 68HC11 EVBU boards are required. One board provides the processing power for the Transmitter and the other board provides the computing power for the Receiver. Ensure that MiniIDE is set to the correct assembler of "asm11.exe" and this is done by going into the options menu in the program.

1. Assemble the circuit as follows:
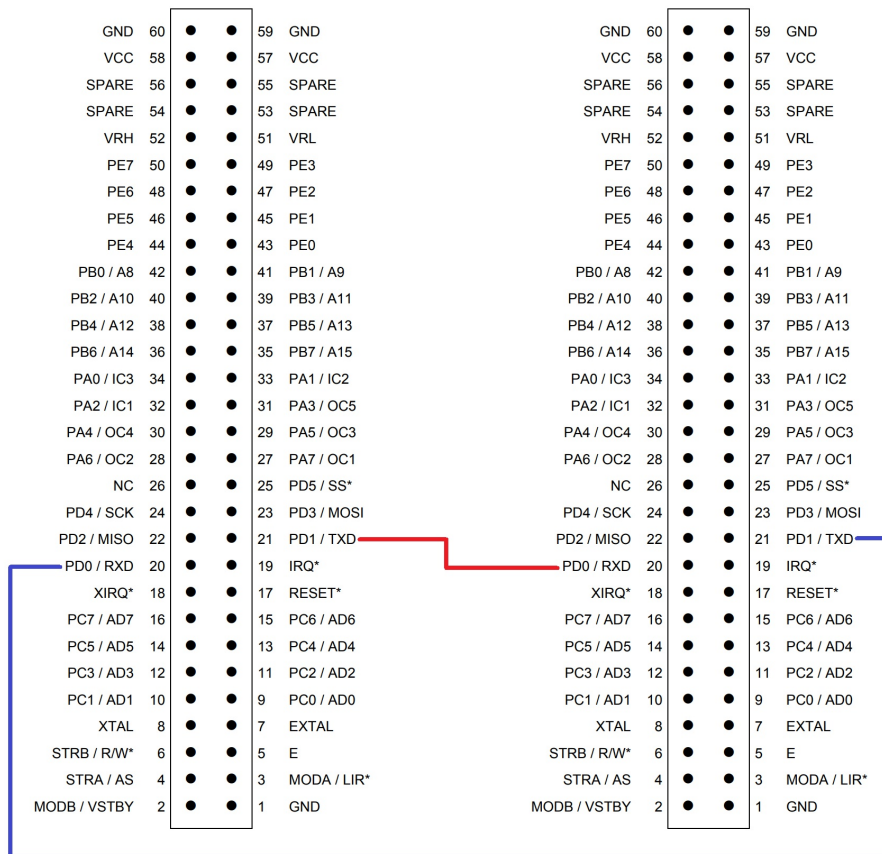
2. We will start off with the TX portion of the lab. Create, assemble, make appropriate comments and save the original program shown below on one computer.

```
REGBASE    EQU    $1000

BAUD   EQU    $2B

SCCR1  EQU    $2C
```

```
SCCR2 EQU    $2D
SCSR  EQU    $2E
SCDR  EQU    $2F


      ORG    $0100
      LDX    #REGBASE
      LDY    #MSG


      LDAA   #%0011000   ;Set Baud
      STAA   BAUD,X


      CLR    SCCR1,X            ;Set Xmit


      LDAA   #%00001000  ;Enable Transmitter
      STAA   SCCR2,X


XMIT  LDAA   SCSR,X             ;Read Status Reg to Clear Flags


      LDAA   0,Y         ;Get character of message
      CMPA   #$04        ;Check for EOT 0027
      BEQ    DONE        ;If EOT xmit is done
      STAA   SCDR,X             ;xmit the character


WAIT  BRCLR SCSR,X #%01000000 WAIT  ;Wait for TC
      INY                ;point to next character


      BRA    XMIT        ;Do it again


DONE  SWI



      ORG    $0000
MSG   FCC    "Hello!"
      FCB    $04
```

3. Download the .s19 file into the microprocessor and connect to terminal. In the terminal window of the of the IDE, one should now see activity from the microprocessor.

4. For the RX portion of the lab. Create, assemble, make appropriate comments and save the original program shown below on the other computer.

```
REGBASE      EQU    $1000

BAUD  EQU    $2B

SCCR1 EQU    $2C

SCCR2 EQU    $2D

SCSR  EQU    $2E

SCDR  EQU    $2F


        ORG    $0120

        LDX    #REGBASE

        LDY    #BUFFER


        LDAA   #%0011000    ;Set Baud rate for 9600

        STAA   BAUD,X


        CLR    SCCR1,X            ;Set Rcv Mode to 8-bit


        LDAA   #%00000100   ;Enable Receiver

        STAA   SCCR2,X


RCV     BRCLR SCSR,X #%00100000 RCV    ;Wait for data to arrive


        LDAA   SCDR,X

        CMPA   #$0D

        BEQ    DONE


        STAA   0,Y

        INY


        BRA    RCV
```

```
        DONE   SWI



            ORG    $01E0

BUFFER          RMB    32              ;Reserve 32 bytes
```

5. Download the .s19 file into the microprocessor and connect to terminal. In the terminal window of the of the IDE, one should now see activity from the microprocessor. Additionally, the message of "Hello !" will be displayed in the terminal window in hexadecimal form as "48656C6C6F2021".

6. To send a live message from one computer to another, one can start typing in the terminal window and the string will appear on the other computer. When pressing the enter key, a new line will start and one can start typing a new string.