8051 Interfacing with ADC

Topics of Discussion

- Basics of ADC
- Interfacing with **ADC0804**
  - Assembly Language Programming of **ADC0804**
- Basics of **ADC0808/0809**
  - Assembly Language Programming of **ADC0808/0809**
- C Language Programming of **ADC0804** and **ADC0808/0809**

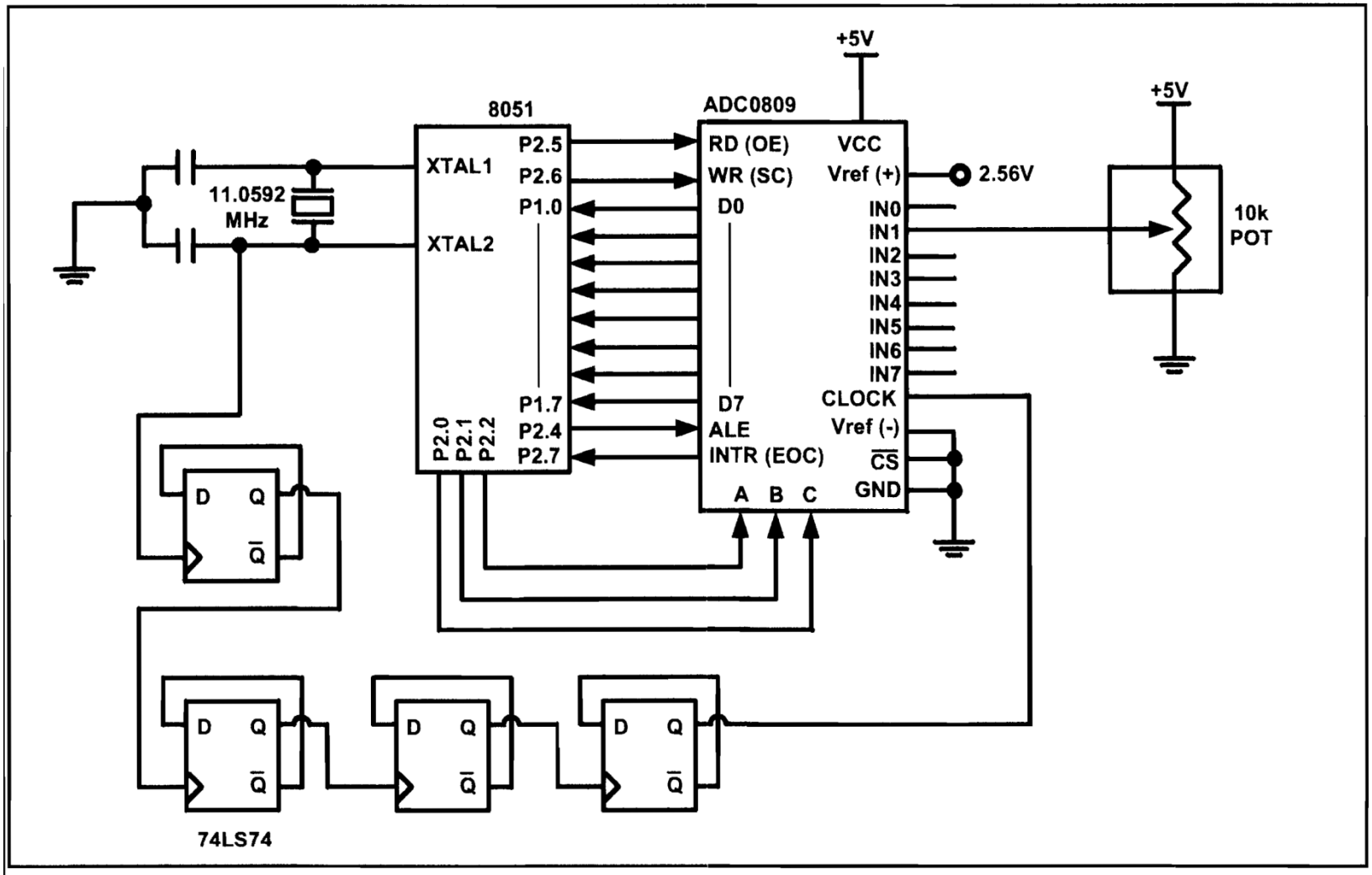

Figure 13-7. 8051 Connection to ADC0809 for Channel 1

Programming ADC0808/0809 in Assembly

```
        ALE     BIT P2.4
        OE      BIT P2.5
        SC      BIT P2.6
        EOC     BIT P2.7
        ADDR_A BIT P2.0
        ADDR_B BIT P2.1
        ADDR_C BIT P2.2
        MYDATA EQU P1
        ORG     0H
        MOV     MYDATA,#0FFH      ;make P1 an input
        SETB    EOC               ;make EOC an input
        CLR     ALE               ;clear ALE
        CLR     SC                ;clear WR
        CLR     OE                ;clear RD
BACK:
        CLR     ADDR_C            ;C=0
        CLR     ADDR_B            ;B=0
        SETB    ADDR_A            ;A=1 (Select Channel 1)
        ACALL   DELAY             ;make sure the addr is stable
        SETB    ALE               ;latch address
        ACALL   DELAY             ;delay for fast DS89C4x0 Chip
        SETB    SC                ;start conversion
        ACALL   DELAY
        CLR     ALE
        CLR     SC
HERE:
        JB      EOC, HERE         ;wait until done
HERE1:
        JNB     EOC, HERE1        ;wait until done
        SETB    OE                ;enable RD
        ACALL   DELAY             ;wait
        MOV     A,MYDATA          ;read data
        CLR     OE                ;clear RD for next time
        ACALL   CONVERSION        ;hex to ASCII (Chap 6)
        ACALL   DATA_DISPLAY      ;display the data (Chap 12)
        SJMP    BACK
```

Programming ADC0808/0809 in C

```
#include <reg51.h>
sbit ALE = P2^4;
sbit OE = P2^5;
sbit SC = P2^6;
sbit EOC = P2^7;
sbit ADDR_A = P2^0;
sbit ADDR_B = P2^1;
sbit ADDR_C = P2^2;
sfr  MYDATA = P1;
void main()
  {
    unsigned char value;
    MYDATA = 0xFF;                  //make P1 an input
    EOC = 1;                        //make EOC an input
    ALE = 0;                        //clear ALE
    OE = 0;                         //clear OE
    SC = 0;                         //clear SC
    while(1)
      {
        ADDR_C = 0;                 //C=0
        ADDR_B = 0;                 //B=0
        ADDR_A = 1;                 //A=1 (Select Channel 1)
        MSDelay(1);                 //delay for fast DS89C4x0
        ALE = 1;
        MSDelay(1);
        SC = 1;
        MSDelay(1);
        ALE = 0;
        SC = 0;                     //start conversion
        while(EOC==1);              //wait for data conversion
        while(EOC==0);
        OE = 1;                     //enable RD
        MSDelay(1);
        value = MYDATA;             //get the data
        OE = 0;                     //disable RD for next round
        ConvertAndDisplay(value);   //Chap 7 & 12
      }
  }
```

Programming ADC0804 in C

The 8051 C version of the above program is given below.

```
#include <reg51.h>
sbit RD = P2^5;
sbit WR = P2^6;
sbit INTR = P2^7;
sfr MYDATA = P1;
void main()
  {
    unsigned char value;
    MYDATA = 0xFF;          //make P1 and input
    INTR = 1;               //make INTR and input
    RD = 1;                 //set RD high
    WR = 1;                 //set WR high
    while(1)
     {
       WR = 0;              //send WR pulse
       WR = 1;              //L-to-H(Start Conversion)
       while(INTR == 1);    //wait for EOC
       RD = 0;              //send RD pulse
       value = MYDATA;      //read value
       ConvertAndDisplay(value);  //(Chap 7 and 12)
       RD = 1;
     }
  }
```