ADCTIMER PAGE 1

1 ;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

2 ;

3 ; Author : ADI - Apps www.analog.com/MicroConverter

4 ;

5 ; Date : 31 JAN 2002

6 ;

7 ; File : ADCtimer.asm

8 ;

9 ; Hardware : ADuC831

10 ;

11 ; Description : Performs ADC conversions at 10KSPS in Timer2 mode.

12 ; Outputs ADC results on P0 & P2. Continuously

13 ; flashes LED (independently of ADC routine) at

14 ; approximately 5Hz.

15 ; All rate calculations assume an 11.0592MHz Mclk.

16 ;

17 ;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

18

19 $MOD831 ; Use 8052&ADuC812 predefined symbols

20

00B4 21 LED EQU P3.4 ; P3.4 drives red LED on eval board

0000 22 CHAN EQU 0 ; convert this ADC input channel..

23 ; ..chan values can be 0 thru 8

24 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25 ; BEGINNING OF CODE

---- 26 CSEG

27

0000 28 ORG 0000h

29

0000 02004B 30 JMP MAIN ; jump to main program

31 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

32 ; INTERRUPT VECTOR SPACE

0033 33 ORG 0033H ; (ADC ISR)

34

0033 85D980 35 MOV P0,ADCDATAL ; ADC result low byte to Port0

0036 85DAA0 36 MOV P2,ADCDATAH ; high nibble and channel ID to Port2

0039 32 37 RETI

38

39 ;====================================================================

40 ; MAIN PROGRAM

004B 41 ORG 004Bh

42

004B 43 MAIN:

44

45 ; PRECONFIGURE...

004B 75EFB2 46 MOV ADCCON1,#0B2h ; power up ADC & enable Timer2 mode

004E 75D800 47 MOV ADCCON2,#CHAN ; select channel to convert

0051 75CAD2 48 MOV RCAP2L,#0D2h ; sample period = 2 \* T2 reload prd

0054 75CBFF 49 MOV RCAP2H,#0FFh ; = 2\*(10000h-FFD2h)\*1.085us

0057 75CCD2 50 MOV TL2,#0D2h ; = 2\*46\*1.085us

005A 75CDFF 51 MOV TH2,#0FFh ; = 99.8us

52

53 ; LAUNCH Timer2 DRIVEN CONVERSIONS...

005D D2AF 54 SETB EA ; enable interrupts

005F D2AE 55 SETB EADC ; enable ADC interrupt

0061 D2CA 56 SETB TR2 ; run Timer2

57

58 ; CONTINUE WITH OTHER CODE...

ADCTIMER PAGE 2

0063 B2B4 59 AGAIN: CPL LED ; blink (complement) the LED

0065 12006A 60 CALL DELAY ; delay 100ms

0068 80F9 61 JMP AGAIN ; repeat

62

63 ; the micro is free to continue with other tasks (flashing the LED in

64 ; this case) while the ADC operation is being controlled by Timer2

65 ; and the ADC interrupt service routine.

66

67 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

68 ; SUBROUTINE

69

006A 70 DELAY: ; delay 100ms

71

006A 7FC8 72 MOV R7,#200 ; 200 \* 500us = 100ms

006C 7EE5 73 DLY1: MOV R6,#229 ; 229 \* 2.17us = 500us

006E DEFE 74 DJNZ R6,$ ; sit here for 500us

0070 DFFA 75 DJNZ R7,DLY1 ; repeat 200 times (100ms total)

0072 22 76 RET

77

78 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

79

80 END

VERSION 1.2h ASSEMBLY COMPLETE, 0 ERRORS FOUND

ADCTIMER PAGE 3

ADCCON1. . . . . . . . . . . . . D ADDR 00EFH PREDEFINED

ADCCON2. . . . . . . . . . . . . D ADDR 00D8H PREDEFINED

ADCDATAH . . . . . . . . . . . . D ADDR 00DAH PREDEFINED

ADCDATAL . . . . . . . . . . . . D ADDR 00D9H PREDEFINED

AGAIN. . . . . . . . . . . . . . C ADDR 0063H

CHAN . . . . . . . . . . . . . . NUMB 0000H

DELAY. . . . . . . . . . . . . . C ADDR 006AH

DLY1 . . . . . . . . . . . . . . C ADDR 006CH

EA . . . . . . . . . . . . . . . B ADDR 00AFH PREDEFINED

EADC . . . . . . . . . . . . . . B ADDR 00AEH PREDEFINED

LED. . . . . . . . . . . . . . . NUMB 00B4H

MAIN . . . . . . . . . . . . . . C ADDR 004BH

P0 . . . . . . . . . . . . . . . D ADDR 0080H PREDEFINED

P2 . . . . . . . . . . . . . . . D ADDR 00A0H PREDEFINED

P3 . . . . . . . . . . . . . . . D ADDR 00B0H PREDEFINED

RCAP2H . . . . . . . . . . . . . D ADDR 00CBH PREDEFINED

RCAP2L . . . . . . . . . . . . . D ADDR 00CAH PREDEFINED

TH2. . . . . . . . . . . . . . . D ADDR 00CDH PREDEFINED

TL2. . . . . . . . . . . . . . . D ADDR 00CCH PREDEFINED

TR2. . . . . . . . . . . . . . . B ADDR 00CAH PREDEFINED