ADCTIMER PAGE 1

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

2 ;

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

4 ;

5 ; Date : March 2001

6 ;

7 ; File : ADCtimer.asm

8 ;

9 ; Hardware : ADuC832

10 ;

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

12 ; Outputs ADC results to RAM. Continuously

13 ; flashes LED (independently of ADC routine) at

14 ; approximately 3Hz.

15 ; All rate calculations assume an 2.097152MHz Mclk.

16 ;

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

18

19 $MOD832 ; Use 8052&ADuC832 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 6

24

---- 25 DSEG

0030 26 ORG 0030H

0028 27 LENGTH EQU 40

0030 28 BUFFER: DS LENGTH ; set up buffer in RAM

29

30 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

31 ; BEGINNING OF CODE

---- 32 CSEG

33

0000 34 ORG 0000h

35

0000 02004B 36 JMP MAIN ; jump to main program

37 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38 ; INTERRUPT VECTOR SPACE

0033 39 ORG 0033H ; (ADC ISR)

0033 B85803 40 CJNE R0,#58H,CONT

0036 02003F 41 JMP EXIT ; place breakpoint here to view ram in debugger after conver

sions

0039 A6DA 42 CONT: MOV @R0,ADCDATAH

003B 08 43 INC R0

003C A6D9 44 MOV @R0,ADCDATAL

003E 08 45 INC R0

003F 32 46 EXIT: RETI

47

48

49 ;====================================================================

50 ; MAIN PROGRAM

004B 51 ORG 004Bh

52

004B 53 MAIN:

004B 7830 54 MOV R0,#BUFFER

55 ; PRECONFIGURE...

004D 75EF9E 56 MOV ADCCON1,#09Eh ; power up ADC & enable Timer2 mode

0050 75D800 57 MOV ADCCON2,#CHAN ; select channel to convert

ADCTIMER PAGE 2

0053 75CAF6 58 MOV RCAP2L,#0F6h ; sample period = 2 \* T2 reload prd

0056 75CBFF 59 MOV RCAP2H,#0FFh ; = 2\*(10000h-FFF6h)\*5.722us

0059 75CCF6 60 MOV TL2,#0F6h ; = 2\*9\*5.722us

005C 75CDFF 61 MOV TH2,#0FFh ; = 102.99us

62

63 ; LAUNCH Timer2 DRIVEN CONVERSIONS...

005F D2AF 64 SETB EA ; enable interrupts

0061 D2AE 65 SETB EADC ; enable ADC interrupt

0063 D2CA 66 SETB TR2 ; run Timer2

67

68 ; CONTINUE WITH OTHER CODE...

0065 B2B4 69 AGAIN: CPL LED ; blink (complement) the LED

0067 7401 70 MOV A,#01H ; Delay length

0069 12006E 71 CALL DELAY ; delay 100ms

006C 80F7 72 JMP AGAIN ; repeat

73

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

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

76 ; and the ADC interrupt service routine.

77

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

79 ; SUBROUTINE

006E 80 DELAY: ; Delays by 100ms \* A

81 ; 100mSec based on 2.097152MHZ

82 ; Core Clock

83 ; i.e. default ADuC832 Clock

84

006E F9 85 MOV R1,A ; Acc holds delay variable

006F 7A22 86 DLY0: MOV R2,#022h ; Set up delay loop0

0071 7BFF 87 DLY1: MOV R3,#0FFh ; Set up delay loop1

0073 DBFE 88 DJNZ R3,$ ; Dec R3 & Jump here until R3 is 0

0075 DAFA 89 DJNZ R2,DLY1 ; Dec R2 & Jump DLY1 until R2 is 0

0077 D9F6 90 DJNZ R1,DLY0 ; Dec R1 & Jump DLY0 until R1 is 0

0079 22 91 RET ; Return from subroutine

92

93

94

95 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

96

97 END

VERSION 1.2h ASSEMBLY COMPLETE, 0 ERRORS FOUND

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

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

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

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

AGAIN. . . . . . . . . . . . . . C ADDR 0065H

BUFFER . . . . . . . . . . . . . D ADDR 0030H

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

CONT . . . . . . . . . . . . . . C ADDR 0039H

DELAY. . . . . . . . . . . . . . C ADDR 006EH

DLY0 . . . . . . . . . . . . . . C ADDR 006FH

DLY1 . . . . . . . . . . . . . . C ADDR 0071H

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

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

EXIT . . . . . . . . . . . . . . C ADDR 003FH

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

LENGTH . . . . . . . . . . . . . NUMB 0028H

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

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