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

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; Date : April 2002

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; File : ADCtimer.asm

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; Hardware : ADuC814

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

; Outputs ADC results to RAM. Continuously

; flashes LED (independently of ADC routine) at

; approximately 3Hz.

; All rate calculations assume an 2.097152MHz Mclk.

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$MOD814 ; Use 8052&ADuC814 predefined symbols

LED EQU P3.3 ; P3.3 drives red LED on eval board

CHAN EQU 0 ; convert this ADC input channel..

; ..chan values can be 0 thru 6

DSEG

ORG 0030H

LENGTH EQU 40

BUFFER: DS LENGTH ; set up buffer in RAM

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; BEGINNING OF CODE

CSEG

ORG 0000h

JMP MAIN ; jump to main program

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; INTERRUPT VECTOR SPACE

ORG 0033H ; (ADC ISR)

CJNE R0,#58H,CONT

JMP EXIT

CONT: MOV @R0,ADCDATAH

INC R0

MOV @R0,ADCDATAL

INC R0

EXIT: RETI

;====================================================================

; MAIN PROGRAM

ORG 004Bh

MAIN:

MOV R0,#BUFFER

; PRECONFIGURE...

MOV ADCCON1,#09Eh ; power up ADC & enable Timer2 mode

MOV ADCCON2,#CHAN ; select channel to convert

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

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

MOV TL2,#0F6h ; = 2\*9\*5.722us

MOV TH2,#0FFh ; = 102.99us

; LAUNCH Timer2 DRIVEN CONVERSIONS...

SETB EA ; enable interrupts

SETB EADC ; enable ADC interrupt

SETB TR2 ; run Timer2

; CONTINUE WITH OTHER CODE...

AGAIN: CPL LED ; blink (complement) the LED

MOV A,#01H ; Delay length

CALL DELAY ; delay 100ms

JMP AGAIN ; repeat

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

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

; and the ADC interrupt service routine.

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; SUBROUTINE

DELAY: ; Delays by 100ms \* A

; 100mSec based on 2.097152MHZ

; Core Clock

; i.e. default ADuC814 Clock

MOV R1,A ; Acc holds delay variable

DLY0: MOV R2,#022h ; Set up delay loop0

DLY1: MOV R3,#0FFh ; Set up delay loop1

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

DJNZ R2,DLY1 ; Dec R2 & Jump DLY1 until R2 is 0

DJNZ R1,DLY0 ; Dec R1 & Jump DLY0 until R1 is 0

RET ; Return from subroutine

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END