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

;

; Author : ADI - Apps

;

; Date : October 2003

;

; File : UART.asm

;

; Hardware : ADuC841

;

; Description : This Program transmits the numbers 0->7F (starting

; with 0) down the UART in ASCII form to the PC where

; they can be viewed using the preconfigured

; Hyperterminal program. (c:\ADuC\_Beta841\9600com1.ht)

; After the transmission of the 16 bytes a 2 second

; delay is called and the process is repeated.

;

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

;

$MOD841 ;Use 8052 predefined Symbols

LED EQU P3.4

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; BEGINNING OF CODE

CSEG

ORG 0000H

JMP MAIN

ORG 0060H ; Start code at address above interrupts

MAIN: ; Main program

MOV T3CON,#86h

MOV T3FD,#08h

MOV SCON,#52h

START:

CPL LED ; CPL LED with each transmission

MOV DPTR, #TITLE

CALL SENDSTRING ; write title block on screen

MOV R0, #00H ; Start transmissions from 0

MOV R1, #08H ; Start a new line after 8 transmissions

LOOP1: ; Every eight transmissions start on a

; new line

MOV A, #10 ; Transmit a linefeed

CALL SENDCHAR

MOV A, #13 ; Transmit a carriage return

CALL SENDCHAR

MOV R1, #08H

LOOP2:

MOV A, #20H ; Transmit a SPACE (=ASCII 20) between

; transmissions on same line

CALL SENDCHAR

MOV A, R0 ; Transmit R0 = present data

CALL SENDVAL

INC R0 ; increment data

CJNE A, #7FH, CONT ; check if data =7F, if no continue

JMP WAIT5S ; if = 7F wait 5s and repeat

CONT: DEC R1 ; decrement R1....

MOV A, R1

CJNE A, #00H, LOOP2 ; and check if new line is required

; jump to loop 2 for a space

JMP LOOP1 ; jump to loop 1 for a new line

WAIT5S: MOV A, #200 ; wait 2s

CALL DELAY

JMP START ; start transmissions again

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; SENDSTRING

SENDSTRING: ; sends ASCII string to UART starting at location

; DPTR and ending with a null (0) value

PUSH ACC

PUSH B

CLR A

MOV B,A

IO0010: MOV A,B

INC B

MOVC A,@A+DPTR

JZ IO0020

CALL SENDCHAR

JMP IO0010

IO0020: POP B

POP ACC

RET

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; SENDCHAR

SENDCHAR: ; sends ASCII value contained in A to UART

JNB TI,$ ; wait til present char gone

CLR TI ; must clear TI

MOV SBUF,A

RET

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; SENDVAL

SENDVAL: ; converts the hex value of A into two ASCII chars,

; and then spits these two characters up the UART.

; does not change the value of A.

PUSH ACC

SWAP A

CALL HEX2ASCII

CALL SENDCHAR ; send high nibble

POP ACC

PUSH ACC

CALL HEX2ASCII

CALL SENDCHAR ; send low nibble

POP ACC

RET

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; HEX2ASCII

HEX2ASCII: ; converts A into the hex character representing the

; value of A's least significant nibble

ANL A,#00Fh

CJNE A,#00Ah,$+3

JC IO0030

ADD A,#007h

IO0030: ADD A,#'0'

RET

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

; DELAY

DELAY:

MOV R5,A ; Acc holds delay variable

DLY0: MOV R6,#090h ; Set up delay loop0

DLY1: MOV R7,#0FFh ; Set up delay loop1

DJNZ R7,$ ; Dec R2 until R2 is zero

DJNZ R6,DLY1 ; Dec R1 & Jump DLY1 until R1 is 0

DJNZ R5,DLY0 ; Dec R0 & Jump DLY0 until R0 is 0

RET ; Return from subroutine

;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TITLE: DB 10,10,13,'\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_',10,13

DB 'Analog Devices MicroConverter ADuC841',10,13

DB ' UART Demo Routine',10,13

DB ' Transmission of Data from 0 to 7F',10,13,0

END