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1 ;====================================================================

2 ;

3 ; Author : ADI - Apps

4 ;

5 ; Date : April 2002

6 ;

7 ; File : UART.asm

8 ;

9 ; Hardware : ADuC832

10 ;

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

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

13 ; they can be viewed using the preconfigured

14 ; Hyperterminal program. (c:\ADuC\_Beta832\9600com1.ht)

15 ; After the transmission of the 16 bytes a 5 second

16 ; delay is called and the process is repeated.

17 ;

18 ;====================================================================

19 ;

20 $MOD832 ;Use 8052 predefined Symbols

21

00B4 22 LED EQU P3.4

23

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

25 ; BEGINNING OF CODE

---- 26 CSEG

0000 27 ORG 0000H

28

0000 020060 29 JMP MAIN

30

0060 31 ORG 0060H ; Start code at address above interrupts

32

33

0060 34 MAIN: ; Main program

35 ;Configure Uart for 9600 baud at defualt core freq of 2.097152MHz

0060 759E82 36 MOV T3CON,#82h

0063 759D2D 37 MOV T3FD,#02Dh

0066 759852 38 MOV SCON,#52h

39

0069 40 START:

0069 B2B4 41 CPL LED ; CPL LED with each transmission

006B 9000EB 42 MOV DPTR, #TITLE

006E 12009F 43 CALL SENDSTRING ; write title block on screen

44

0071 7800 45 MOV R0, #00H ; Start transmissions from 0

0073 7908 46 MOV R1, #08H ; Start a new line after 8 transmissions

47

0075 48 LOOP1: ; Every eight transmissions start on a

49 ; new line

0075 740A 50 MOV A, #10 ; Transmit a linefeed

0077 1200B7 51 CALL SENDCHAR

007A 740D 52 MOV A, #13 ; Transmit a carriage return

007C 1200B7 53 CALL SENDCHAR

54

007F 7908 55 MOV R1, #08H

56

0081 57 LOOP2:

0081 7420 58 MOV A, #20H ; Transmit a SPACE (=ASCII 20) between

UART2 PAGE 2

59 ; transmissions on same line

0083 1200B7 60 CALL SENDCHAR

61

0086 E8 62 MOV A, R0 ; Transmit R0 = present data

0087 1200BF 63 CALL SENDVAL

008A 08 64 INC R0 ; increment data

65

008B B47F03 66 CJNE A, #7FH, CONT ; check if data =7F, if no continue

008E 020098 67 JMP WAIT5S ; if = 7F wait 5s and repeat

68

0091 19 69 CONT: DEC R1 ; decrement R1....

0092 E9 70 MOV A, R1

0093 B400EB 71 CJNE A, #00H, LOOP2 ; and check if new line is required

72 ; jump to loop 2 for a space

0096 80DD 73 JMP LOOP1 ; jump to loop 1 for a new line

74

75

0098 7432 76 WAIT5S: MOV A, #50 ; wait 5s

009A 1200DF 77 CALL DELAY

009D 80CA 78 JMP START ; start transmissions again

79

80

81 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

82 ; SENDSTRING

83

009F 84 SENDSTRING: ; sends ASCII string to UART starting at location

85 ; DPTR and ending with a null (0) value

86

009F C0E0 87 PUSH ACC

00A1 C0F0 88 PUSH B

00A3 E4 89 CLR A

00A4 F5F0 90 MOV B,A

00A6 E5F0 91 IO0010: MOV A,B

00A8 05F0 92 INC B

00AA 93 93 MOVC A,@A+DPTR

00AB 6005 94 JZ IO0020

00AD 1200B7 95 CALL SENDCHAR

00B0 80F4 96 JMP IO0010

00B2 D0F0 97 IO0020: POP B

00B4 D0E0 98 POP ACC

99

00B6 22 100 RET

101

102 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

103 ; SENDCHAR

104

00B7 105 SENDCHAR: ; sends ASCII value contained in A to UART

106

00B7 3099FD 107 JNB TI,$ ; wait til present char gone

00BA C299 108 CLR TI ; must clear TI

00BC F599 109 MOV SBUF,A

110

00BE 22 111 RET

112

113 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

114 ; SENDVAL

115

00BF 116 SENDVAL: ; converts the hex value of A into two ASCII chars,

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117 ; and then spits these two characters up the UART.

118 ; does not change the value of A.

119

00BF C0E0 120 PUSH ACC

00C1 C4 121 SWAP A

00C2 1200D3 122 CALL HEX2ASCII

00C5 11B7 123 CALL SENDCHAR ; send high nibble

00C7 D0E0 124 POP ACC

00C9 C0E0 125 PUSH ACC

00CB 1200D3 126 CALL HEX2ASCII

00CE 11B7 127 CALL SENDCHAR ; send low nibble

00D0 D0E0 128 POP ACC

129

00D2 22 130 RET

131

132

133 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

134 ; HEX2ASCII

135

00D3 136 HEX2ASCII: ; converts A into the hex character representing the

137 ; value of A's least significant nibble

138

00D3 540F 139 ANL A,#00Fh

00D5 B40A00 140 CJNE A,#00Ah,$+3

00D8 4002 141 JC IO0030

00DA 2407 142 ADD A,#007h

00DC 2430 143 IO0030: ADD A,#'0'

144

00DE 22 145 RET

146

147 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

148 ; DELAY

00DF 149 DELAY: ; Delays by 100ms \* A

150 ; 100mSec based on 2.097152MHZ

151 ; Core Clock

152 ; i.e. default ADuC832 Clock

153

00DF FD 154 MOV R5,A ; Acc holds delay variable

00E0 7E22 155 DLY0: MOV R6,#022h ; Set up delay loop0

00E2 7FFF 156 DLY1: MOV R7,#0FFh ; Set up delay loop1

00E4 DFFE 157 DJNZ R7,$ ; Dec R2 until R2 is zero

00E6 DEFA 158 DJNZ R6,DLY1 ; Dec R1 & Jump DLY1 until R1 is 0

00E8 DDF6 159 DJNZ R5,DLY0 ; Dec R0 & Jump DLY0 until R0 is 0

00EA 22 160 RET ; Return from subroutine

161 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

162

163

00EB 0A0A0D5F 164 TITLE: DB 10,10,13,'\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_',10,13

00EF 5F5F5F5F

00F3 5F5F5F5F

00F7 5F5F5F5F

00FB 5F5F5F5F

00FF 5F5F5F5F

0103 5F5F5F5F

0107 5F5F5F5F

010B 5F5F5F5F

010F 5F5F5F0A

0113 0D

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0114 416E616C 165 DB 'Analog Devices MicroConverter ADuC832',10,13

0118 6F672044

011C 65766963

0120 6573204D

0124 6963726F

0128 436F6E76

012C 65727465

0130 72204144

0134 75433833

0138 320A0D

013B 20202020 166 DB ' UART Demo Routine',10,13

013F 20202020

0143 20554152

0147 54204465

014B 6D6F2052

014F 6F757469

0153 6E650A0D

0157 20205472 167 DB ' Transmission of Data from 0 to 7F',10,13,0

015B 616E736D

015F 69737369

0163 6F6E206F

0167 66204461

016B 74612066

016F 726F6D20

0173 3020746F

0177 2037460A

017B 0D00

168

169 END

VERSION 1.2h ASSEMBLY COMPLETE, 0 ERRORS FOUND

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ACC. . . . . . . . . . . . . . . D ADDR 00E0H PREDEFINED

B. . . . . . . . . . . . . . . . D ADDR 00F0H PREDEFINED

CONT . . . . . . . . . . . . . . C ADDR 0091H

DELAY. . . . . . . . . . . . . . C ADDR 00DFH

DLY0 . . . . . . . . . . . . . . C ADDR 00E0H

DLY1 . . . . . . . . . . . . . . C ADDR 00E2H

HEX2ASCII. . . . . . . . . . . . C ADDR 00D3H

IO0010 . . . . . . . . . . . . . C ADDR 00A6H

IO0020 . . . . . . . . . . . . . C ADDR 00B2H

IO0030 . . . . . . . . . . . . . C ADDR 00DCH

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

LOOP1. . . . . . . . . . . . . . C ADDR 0075H

LOOP2. . . . . . . . . . . . . . C ADDR 0081H

MAIN . . . . . . . . . . . . . . C ADDR 0060H

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

SBUF . . . . . . . . . . . . . . D ADDR 0099H PREDEFINED

SCON . . . . . . . . . . . . . . D ADDR 0098H PREDEFINED

SENDCHAR . . . . . . . . . . . . C ADDR 00B7H

SENDSTRING . . . . . . . . . . . C ADDR 009FH

SENDVAL. . . . . . . . . . . . . C ADDR 00BFH

START. . . . . . . . . . . . . . C ADDR 0069H

T3CON. . . . . . . . . . . . . . D ADDR 009EH PREDEFINED

T3FD . . . . . . . . . . . . . . D ADDR 009DH PREDEFINED

TI . . . . . . . . . . . . . . . B ADDR 0099H PREDEFINED

TITLE. . . . . . . . . . . . . . C ADDR 00EBH

WAIT5S . . . . . . . . . . . . . C ADDR 0098H