

## 162COG Series Sample Program

```

;LCD CONTROLLER:NT7603
  RS EQU P1.0
  R_W EQU P1.1
  E EQU P1.2
  ORG 0000H
  JMP START
START:
  LCALL DELAY30ms
  LCALL DELAY30ms
  LCALL DELAY30ms
  LCALL DELAY30ms
  CLR RS
  CLR R_W
  MOV A,#00100000B      ;FUNCTION SET
  SETB E
  CLR E
  MOV A,#00100000B      ;FUNCTION SET
  SET E
  CLR E
  LCALL DELAY43us
  MOV A,#10000000B      ;FUNCTION SET
  SET E
  CLR E
  LCALL DELAY43us
  LCALL INTI
  LCALL DELAY30ms
  LCALL DELAY30ms
  LCALL DELAY30ms
  LCALL DELAY30ms
START1:
  MOV B,#11111111B      ;ALL POINTS ON
  LCALL TEST1
  LCALL DELAY1

  MOV B,#00000000B      ;CHECKER1 ON
  LCALL TEST1
  LCALL DELAY1

  MOV B,#00000001B      ;CHECKER2 ON
  LCALL TEST1
  LCALL DELAY1

  MOV 45H,#01000001B    ;ALL CHAR ON
  MOV 46H,#01100001B
  LCALL TEST5
  LCALL DELAY1

  MOV A,#00000001B      ;DISPLAY CLEAR
  LCALL WCOM
  LCALL DELAY1
  JMP START1

INTI:
  MOV A,#00001100B      ;DISPLAY ON(CURSOR ON,BLINK OFF)
  LCALL WCOM
  LCALL DELAY43us
  MOV A,#00000001B      ;DISPLAY CLEAR
  LCALL WCOM
  LCALL DELAY30ms
  MOV A,#00000110B      ;ENTRY MODE SET
  LCALL WCOM
  LCALL DELAY43us
  LCALL W_CGRAM
  RET

TEST1:MOV A,#00000010B   ;CURSOR INITIAL
      LCALL WCOM
      LCALL DELAY30ms
      MOV A,#10000000B   ;SET DDRAM ADDRESS(00H)
      LCALL WCOM
      LCALL DELAY43us
      MOV R2,#16
TEST1_1:MOV A,B
      LCALL WDATA
      DJNZ R2,TEST1_1
;      LCALL DELAY30ms
;      LCALL DELAY30ms

```

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MOV A,#11000000B      ;SET DDRAM ADDRESS(40H)
LCALL WCOM
LCALL DELAY43us
MOV R2,#16
TEST1_2:MOV A,B
LCALL WDATA
DJNZ R2,TEST1_2
RET

TEST5:MOV A,#00000010B ;CURSOR INITIAL
LCALL WCOM
LCALL DELAY30ms
MOV A,#10000000B      ;SET DDRAM ADDRESS(00H)
LCALL WCOM
LCALL DELAY43us
MOV R2,#16
TEST5_1:MOV A,45H
LCALL WDATA
INC 45H
DJNZ R2,TEST5_1
; LCALL DELAY30ms
; LCALL DELAY30ms

MOV A,#11000000B      ;SET DDRAM ADDRESS(40H)
LCALL WCOM
LCALL DELAY43us
MOV R2,#16
TEST5_2:MOV A,46H
LCALL WDATA
INC 46H
DJNZ R2,TEST5_2
RET
W_CGRAM:MOV A,#01000000B
LCALL WCOM
LCALL DELAY43us
MOV R1,#4
W_C1:
MOV A,#11101010B
LCALL WDATA
LCALL DELAY43us
MOV A,#11110101B
LCALL WDATA
LCALL DELAY43us
DJNZ R1,W_C1
MOV R1,#4
W_C2:
MOV A,#11110101B
LCALL WDATA
LCALL DELAY43us
MOV A,#11101010B
LCALL WDATA
LCALL DELAY43us
DJNZ R1,W_C2

RET
DELAY1:MOV 40H,#20
DEL11:MOV 41H,#200
DEL12:MOV 42H,#250
DEL13:DJNZ 42H,DEL13
      DJNZ 41H,DEL12
      DJNZ 40H,DEL11
      RET
DELAY30ms:MOV 40H,#250
DEL21:  MOV 41H,#200
DEL22:  DJNZ 41H,DEL22
      DJNZ 40H,DEL21
      RET
DELAY43us:MOV 44H,#45
DEL31:  DJNZ 44H,DEL31
      RET
DELAY10us:MOV 46H,#20
DEL41:DJNZ 46H,DEL41
RET
DELAY8us:MOV 46H,#10
DEL51:DJNZ 46H,DEL51
RET
WCOM:    PUSH ACC

```

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```
CLR RS
CLR R_W
MOV P0,A
SETB E
CLR E
SWAP A
MOV P0,A
SETB E
CLR E
LCALL DELAY43us
POP ACC
RET
WDATA: PUSH ACC
SETB RS
CLR R_W
MOV P0,A
SETB E
CLR E
SWAP A
MOV P0,A
SETB E
CLR E
LCALL DELAY43us
POP ACC
RET
END
```