

DAFTAR PUSTAKA

Sudjadi, 2005, *Teori & Aplikasi Mikrokontroler : Aplikasi pada Mikrokontroler AT89C51*. Graha Ilmu, Yogyakarta

Toshiba (1999), *Data sheet Book ULN 2003 Toshiba Bipolar Digital Circuit Silicon Monolithic*, www.Toshiba.com

Wasito.S, *Data Sheet Book I Data IC Linier, TTL dan CMOS*, Gramedia, Jakarta

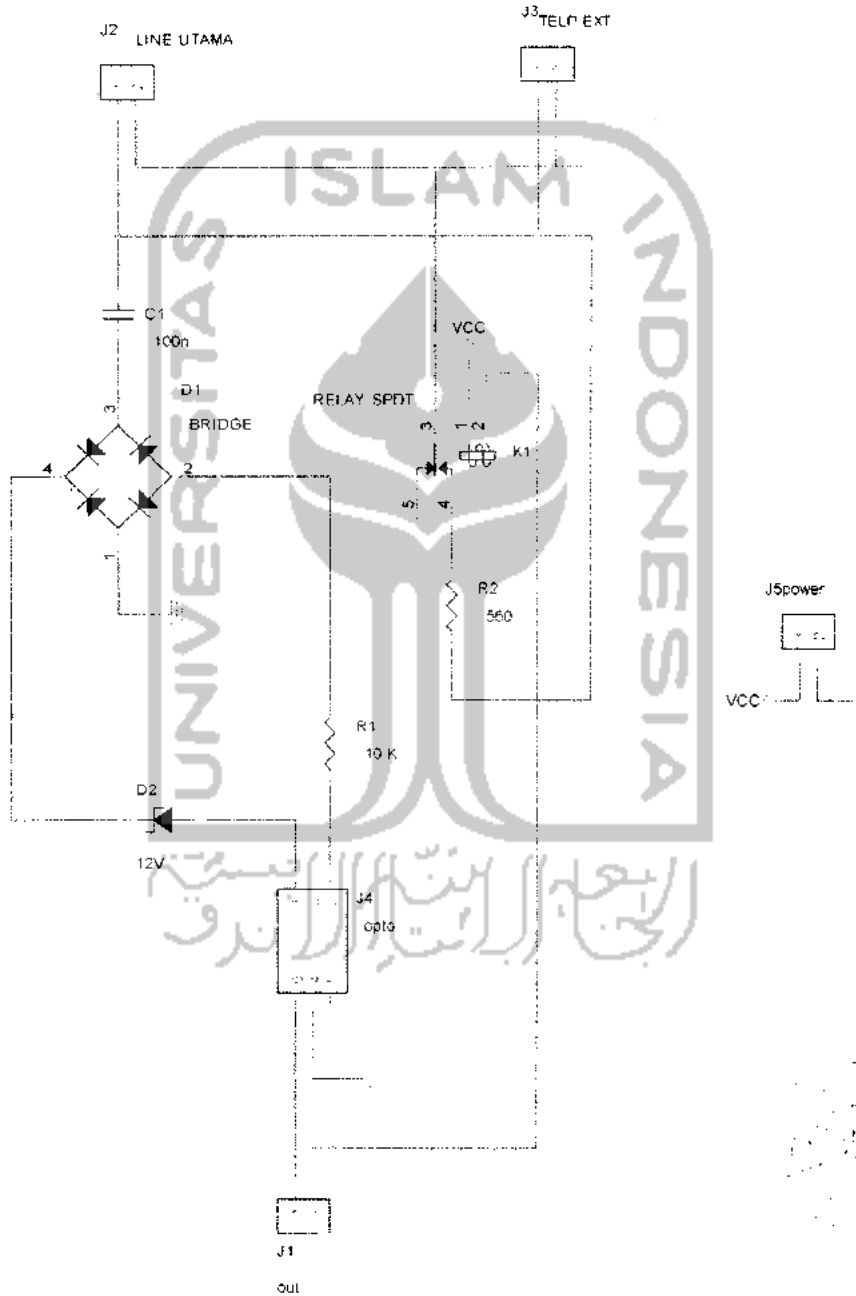
ISD, Data Sheet ISD2500 Series, www.alldatasheet.com

www.dtmf.org

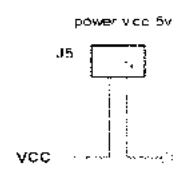
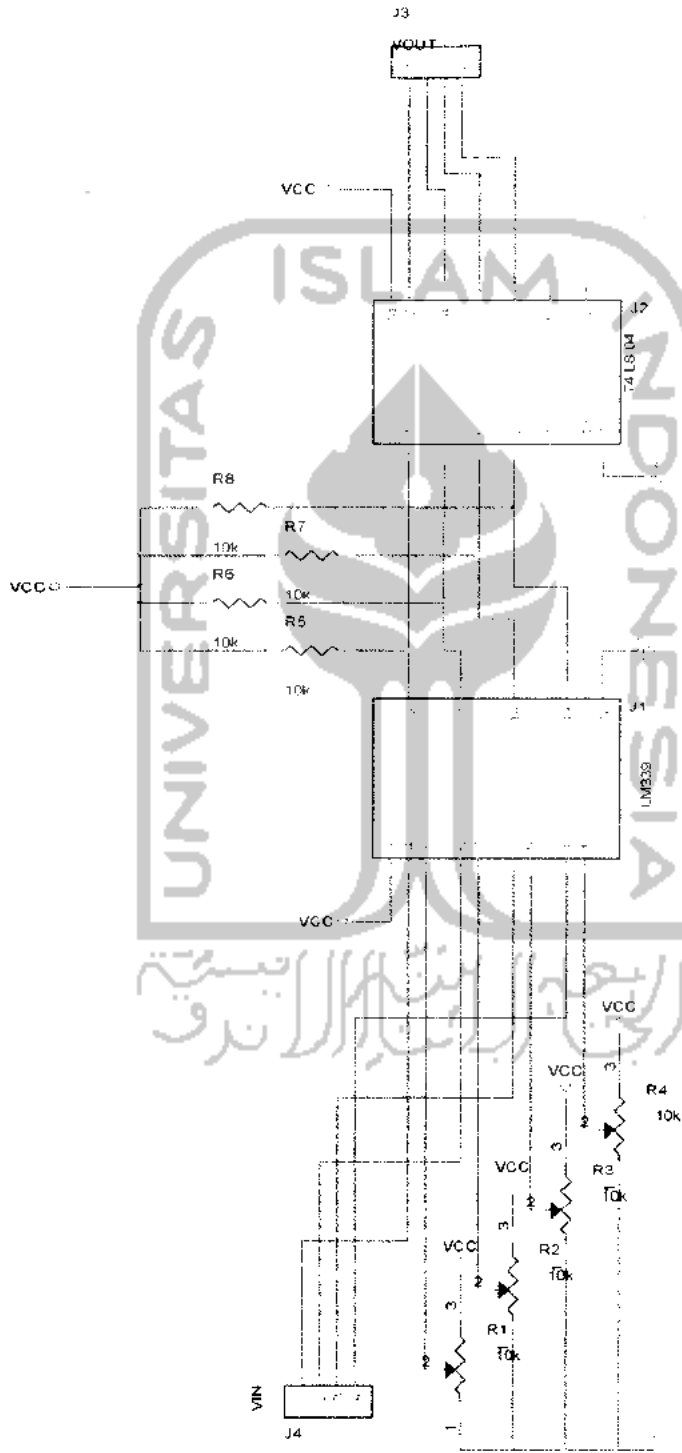
www.atmel.com



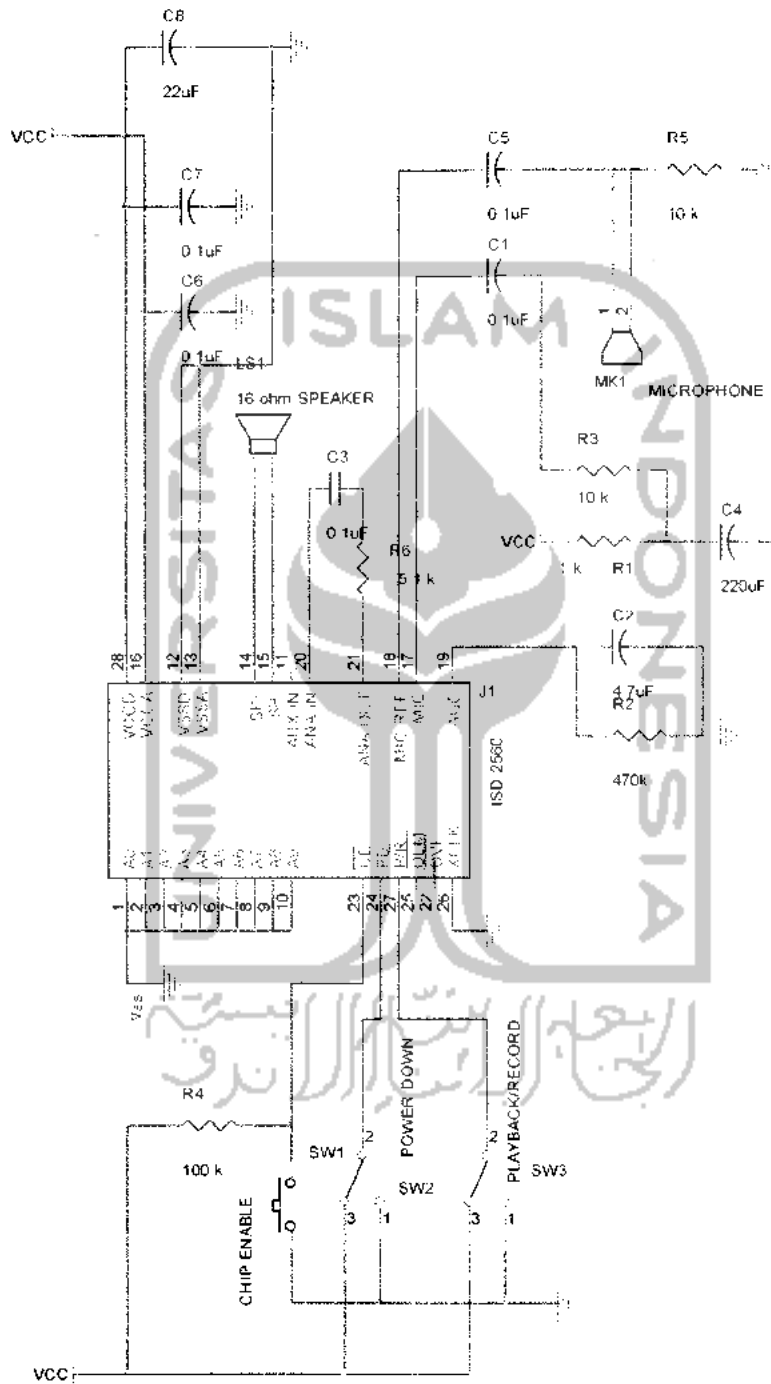
LAMPIRAN



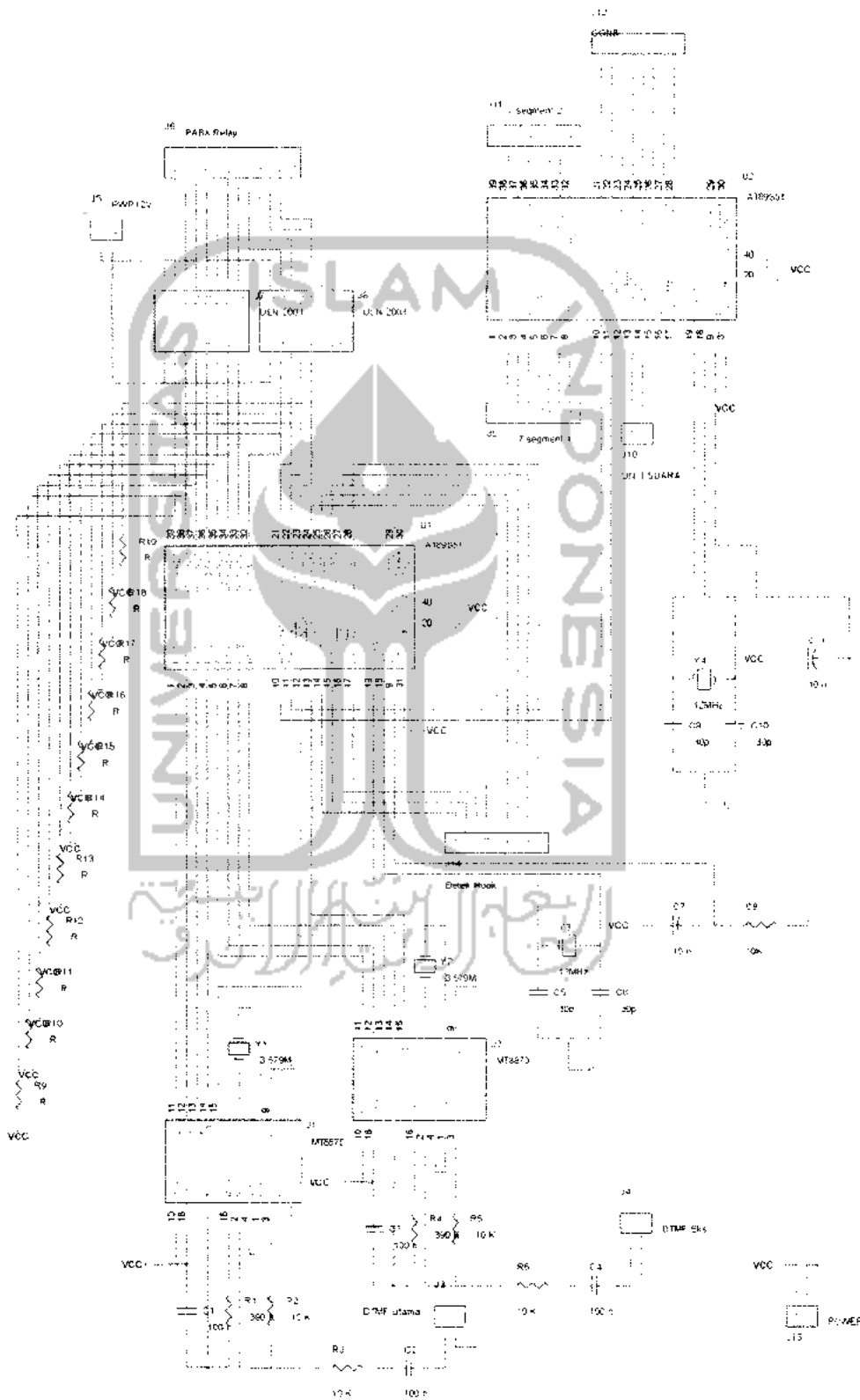
Title		Revisi	
Rangkaian Deteksi Detak kering		Rev	RevCode
		Size	Doc
Date	Saturday, April 05, 2008	Sheet	1 of 1



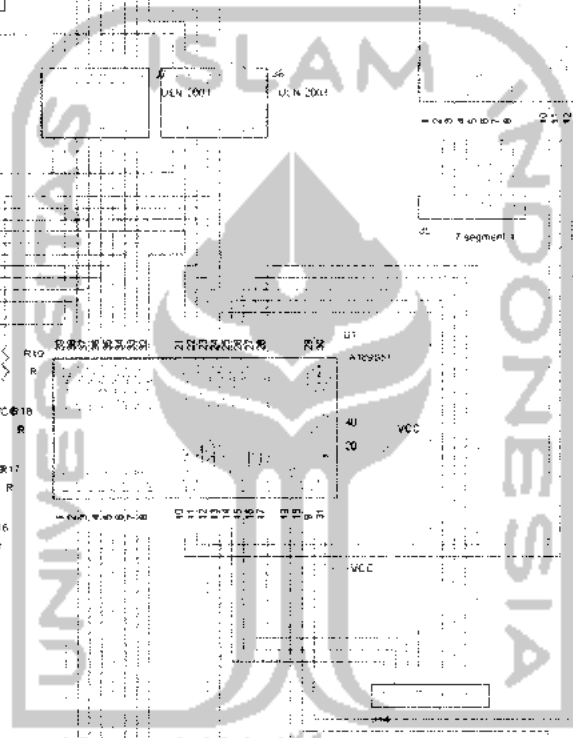
Title		COMPARATOR	
Size	Document Number	Rev	4-Rev
D	Herry Ibnu Nurcahyo	Sheet	1 of 1
Date	Friday, April 11, 2008		



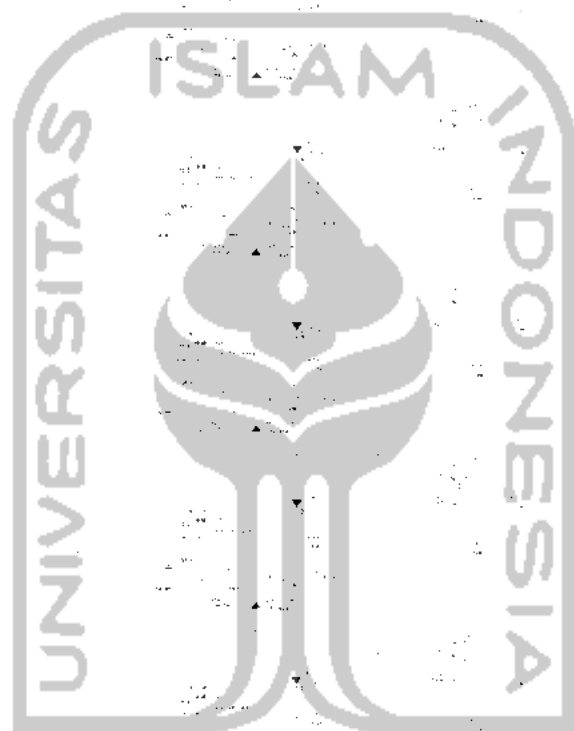
Title		Rangkaian ISD 2560	
Size	E	Document Number	<Doc>
Date	Monday, October 11, 2004	Sheet	1 of 1
Rev	00		



File	Rangkaian Mikrokontroler
Size	Document Number
E	1-Dec-07
Doc	Number: 3011 (Rev. 001)



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



الجامعة الإسلامية
الاندونيسية

=====

: PABX PROGRAM
: Programmed by Herry Ibnu Nurcahyo

=====

STD1 BIT P1.7
STD2 BIT P3.3

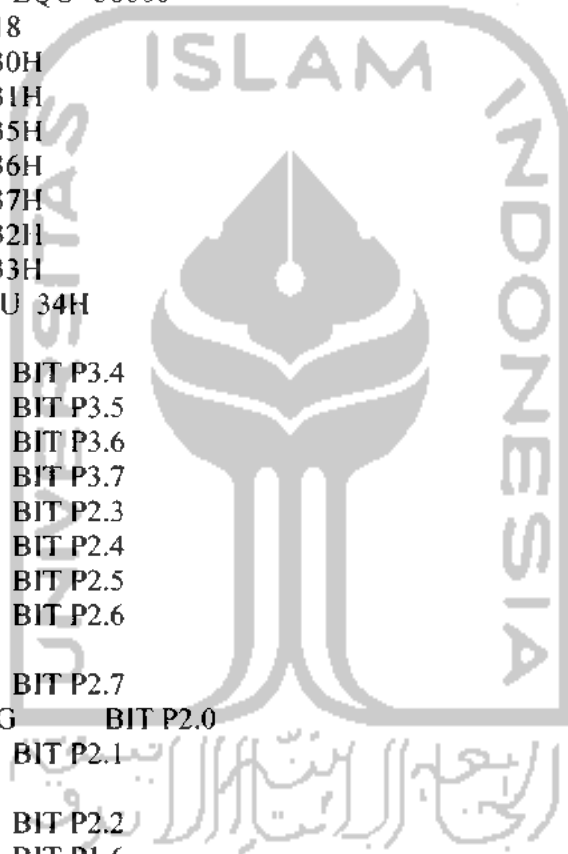
NILAI EQU -100
NILAI2 EQU -50000
NACC EQU 18
ACC1 EQU 30H
ACC2 EQU 31H
ACC3 EQU 35H
ACC4 EQU 36H
ACC5 EQU 37H
SUM EQU 32H
BUFF EQU 33H
SUM_EX EQU 34H

PHOOK1 BIT P3.4
PHOOK2 BIT P3.5
PHOOK3 BIT P3.6
PHOOK4 BIT P3.7
PHOOK5 BIT P2.3
PHOOK6 BIT P2.4
PHOOK7 BIT P2.5
PHOOK8 BIT P2.6

REL_SEMU BIT P2.7
REL_DERING BIT P2.0
REL_SPEAK BIT P2.1

REL_TELP1 BIT P2.2
REL_TELP2 BIT P1.6
REL_TELP3 BIT P1.5
REL_TELP4 BIT P1.4
REL_TELP5 BIT P1.3
REL_TELP6 BIT P1.2
REL_TELP7 BIT P1.1
REL_TELP8 BIT P1.0

SIGN BIT 70H
SIGN2 BIT 71H
SIGN3 BIT 74H
BITSP BIT 72H
BUSY BIT 73H



BUSY_ BIT 74H

ORG 0H
SJMP START

ORG 03H
JMP INT_EX0

ORG 0BH
JMP INT_TIMER0

ORG 23H
JMP SERINT

ORG 30H
START: MOV SP,#81H
MOV TMOD,#21H
MOV TH1,#0FDH
MOV SCON,#50H

CALL INIT_TIMER0
MOV ACC1,#NACC
MOV ACC2,#5
MOV SUM_EX,#0

SETB TR1
SETB EA
SETB ES
SETB ET0
SETB EX0
SETB IT0

MOV SUM,#0

CLR SIGN
CLR SIGN2
CLR BITSP
CLR BUSY

CLR SIGN3
CLR BUSY_
CALL STAND_BY
CLR REL_SPEAK

MAIN:CALL NO_DEFAULT
CLR REL_SPEAK

EXTERNAL_CALL1:
JNB SIGN3,DET_HOOK1
CLR REL_SEMU
CALL DET_DTMF_UTAMA

CLR SIGN3

DET_HOOK1:

JB PHOOK1,EXT1
SETB BUSY
MOV R5,#10H
MOV A,R5
CALL KIRIM
CALL STAND_BY
SETB REL_TELPI
CLR REL_SPEAK
MOV 33H,#1
CLR BITSP
JB SIGN,EXT1
CALL DET_DTMF_EXT

EXT1: JNB PHOOK1,DET_HOOK1
CLR SIGN

DET_HOOK2:

JB PHOOK2,EXT2
SETB BUSY
MOV R5,#20H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP2
CLR REL_SPEAK
MOV 33H,#2
SETB BITSP
JB SIGN,EXT2
CALL DET_DTMF_EXT

EXT2: JNB PHOOK2,DET_HOOK2
CLR SIGN

;JMP MAIN

DET_HOOK3:

JB PHOOK3,EXT3
SETB BUSY
MOV R5,#30H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP3
SETB REL_SPEAK
MOV 33H,#3
SETB BITSP

```
JB SIGN,EXT3
CALL DET_DTMF_EXT
EXT3: JNB PHOOK3,DET_HOOK3
CLR SIGN
```

DET_HOOK4:

```
JB PHOOK4,EXT4
SETB BUSY
MOV R5,#40H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP4
CLR REL_SPEAK
MOV 33H,#4
SETB BITSP
JB SIGN,EXT4
CALL DET_DTMF_EXT
EXT4: JNB PHOOK4,DET_HOOK4
CLR SIGN
```

DET_HOOK5:

```
JB PHOOK5,EXT5
SETB BUSY
MOV R5,#50H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP5
CLR REL_SPEAK
MOV 33H,#5
SETB BITSP
JB SIGN,EXT5
CALL DET_DTMF_EXT
EXT5: JNB PHOOK5,DET_HOOK5
CLR SIGN
```

DET_HOOK6:

```
JB PHOOK6,EXT6
SETB BUSY
MOV R5,#60H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP6
CLR REL_SPEAK
```

```
MOV 33H,#6
SETB BITSP
JB SIGN,EXT6
CALL DET_DTMF_EXT
EXT6: JNB PHOOK6,DET_HOOK6
CLR SIGN
```

```
DET_HOOK7:
JB PHOOK7,EXT7
SETB BUSY
MOV R5,#70H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP7
CLR REL_SPEAK
MOV 33H,#7
SETB BITSP
JB SIGN,EXT7
CALL DET_DTMF_EXT
EXT7: JNB PHOOK7,DET_HOOK7
CLR SIGN
```

```
DET_HOOK8:
JB PHOOK8,EXT8
SETB BUSY
MOV R5,#80H
MOV A,R5
CALL KIRIM
CALL STAND_BY
CLR REL_TELP8
CLR REL_SPEAK
MOV 33H,#8
SETB BITSP
JB SIGN,EXT8
CALL DET_DTMF_EXT
EXT8: JNB PHOOK8,DET_HOOK8
CLR SIGN
```

```
CLR EA
MOV A,#0A0H
CALL KIRIM
MOV A,#0AH
CALL KIRIM
SETB EA
CLR BUSY
```

JMP MAIN

DET_DTMF_EXT:

CALL INIT_TIMER0

SETB TR0

SETB ET0

CLR SIGN2

WAITD1A: JNB SIGN2, WAITD1

CLR SIGN2

RET

WAITD1: JNB STD1, WAITD1A

DTMF1: MOV A, P0

ANL A, #00001111B

CALL KIRIM

SETB REL_DERING

CLR REL_SPEAK

CALL TUJUAN

CLR BUSY

RET

TUJUAN:

NO1: CJNE A, #1, NO2

CALL INIT_TIMER0

MOV ACC2, #5

SETB TR0

CLR SIGN2

SETB REL_TELP1

WAIT1A: SETB REL_DERING

CALL LDELAY

CALL LDELAY

;CALL LDELAY

JB PHOOK1, WAIT1AD

SJMP EX1W

WAIT1AD:

CLR REL_DERING

CALL LDELAY

JB PHOOK1, WAIT1S

SJMP EX1W

WAIT1S: JNB SIGN2, WAIT1A

SJMP EXIT1

EX1W:

JB BITSP, NO1K

SETB REL_TELP1

SJMP GENI

```
NO1K:CALL NO_DEFAULT
      CALL PILIH
      CLR REL_TELP1
GEN1:CLR REL_DERING
      CLR REL_SPEAK
      CALL LDELAY
WAIT1B: CALL LDELAY
WAIT1C: JNB PHOOK1,WAIT1B
EXIT1: CALL STAND_BY
      CLR REL_SPEAK
      MOV A,#0AH
      CALL KIRIM
      CLR BITSP
      RET
```

```
-----
NO2: CJNE A,#2,NO3
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      CLR SIGN2
      SETB REL_TELP2
WAIT2A: SETB REL_DERING
      CALL LDELAY
      CALL LDELAY
      ;CALL LDELAY
      JB PHOOK2,WAIT2AD
      SJMP EX2W
WAIT2AD:
      CLR REL_DERING
      CALL LDELAY
      JB PHOOK2,WAIT2S
      SJMP EX2W
```

```
WAIT2S: JNB SIGN2,WAIT2A
      SJMP EXIT2
```

```
EX2W: JB BITSP,NO2K
      SETB REL_TELP2
      SJMP GEN2
```

```
NO2K:CALL NO_DEFAULT
      CALL PILIH
      CLR REL_TELP2
GEN2:CLR REL_DERING
      CLR REL_SPEAK
      CALL LDELAY
```

```
WAIT2B: CALL LDELAY
WAIT2C: JNB PHOOK2, WAIT2B
EXIT2:  CALL STAND_BY
        CLR REL_SPEAK
        MOV A, #0AH
        CALL KIRIM
        CLR BITSP
        RET
```

```
NO3: CJNE A, #3, NO4
      CALL INIT_TIMER0
      MOV ACC2, #5
      SETB TR0
      CLR SIGN2
      SETB REL_TELP3
WAIT3A: SETB REL_DERING
      CALL LDELAY
      CALL LDELAY
      ;CALL LDELAY
      JB PHOOK3, WAIT3AD
      SJMP EX3W
WAIT3AD: CLR REL_DERING
      CALL LDELAY
      JB PHOOK3, WAIT3S
      SJMP EX3W
WAIT3S: JNB SIGN2, WAIT3A
      SJMP EXIT3
EX3W:  JB BITSP, NO3K
      SETB REL_TELP3
      SJMP GEN3
```

```
NO3K: CALL NO_DEFAULT
      CALL PILIH
      CLR REL_TELP3
GEN3: CLR REL_DERING
      CLR REL_SPEAK
      CALL LDELAY
WAIT3B: CALL LDELAY
WAIT3C: JNB PHOOK3, WAIT3B
EXIT3:  CALL STAND_BY
      CLR REL_SPEAK
      MOV A, #0AH
```

```
CALL KIRIM
CLR BITSP
RET
```

```
-----
NO4: CJNE A,#4,NO5
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      CLR SIGN2
      SETB REL_TELP4
WAIT4A: SETB REL_DERING
      CALL LDELAY
      CALL LDELAY
      ;CALL LDELAY
      JB PHOOK4,WAIT4AD
      SJMP EX4W
WAIT4AD: CLR REL_DERING
      CALL LDELAY
      JB PHOOK4,WAIT4S
      SJMP EX4W

WAIT4S: JNB SIGN2,WAIT4A
      SJMP EXIT4
EX4W:   JB BITSP,NO4K
      SETB REL_TELP4
      SJMP GEN4

NO4K:CALL NO_DEFAULT
      CALL PILIH
      CLR REL_TELP4
GEN4: CLR REL_DERING
      CLR REL_SPEAK
      CALL LDELAY
WAIT4B: CALL LDELAY
WAIT4C: JNB PHOOK4,WAIT4B
EXIT4:  CALL STAND_BY
      CLR REL_SPEAK
      MOV A,#0AH
      CALL KIRIM
      CLR BITSP
      RET
```

```
-----
```

```

NO5: CJNE A,#5,NO6
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      CLR SIGN2
      SETB REL_TELP5
WAIT5A: SETB REL_DERING
        CALL LDELAY
        CALL LDELAY
        ;CALL LDELAY
        JB PHOOK5,WAIT5AD
        SJMP EX5W
WAIT5AD: CLR REL_DERING
         CALL LDELAY
         JB PHOOK5,WAIT5S
         SJMP EX5W

WAIT5S: JNB SIGN2,WAIT5A
        SJMP EXIT5
EX5W:   JB BITSP,NO5K
        SETB REL_TELP5
        SJMP GEN5

NO5K:CALL NO_DEFAULT
      CALL PILIH
      CLR REL_TELP5
GEN5: CLR REL_DERING
      CLR REL_SPEAK
      CALL LDELAY
WAIT5B: CALL LDELAY
WAIT5C: JNB PHOOK5,WAIT5B
EXIT5: CALL STAND_BY
        CLR REL_SPEAK
        MOV A,#0AH
        CALL KIRIM
        CLR BITSP
        RET

```

```

NO6: CJNE A,#6,NO7
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      CLR SIGN2

```



```
SETB REL_TELP6
WAIT6A: SETB REL_DERING
        CALL LDELAY
        CALL LDELAY
        ;CALL LDELAY
        JB PHOOK6,WAIT6AD
        SJMP EX6W
```

```
WAIT6AD: CLR REL_DERING
         CALL LDELAY
         JB PHOOK6,WAIT6S
         SJMP EX6W
```

```
WAIT6S: JNB SIGN2,WAIT6A
        SJMP EXIT6
```

```
EX6W:  JB BITSP,NO6K
        SETB REL_TELP6
        SJMP GEN6
```

```
NO6K: CALL NO_DEFAULT
       CALL PILIH
       CLR REL_TELP6
```

```
GEN6: CLR REL_DERING
       CLR REL_SPEAK
       CALL LDELAY
```

```
WAIT6B: CALL LDELAY
WAIT6C:  JNB PHOOK6,WAIT6B
EXIT6:  CALL STAND_BY
        CLR REL_SPEAK
        MOV A,#0AH
        CALL KIRIM
        CLR BITSP
        RET
```

```
-----
NO7: CJNE A,#7,NO8
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      CLR SIGN2
      SETB REL_TELP7
WAIT7A: SETB REL_DERING
        CALL LDELAY
        CALL LDELAY
        ;CALL LDELAY
```

JB PHOOK7, WAIT7AD
SJMP EX7W
WAIT7AD:
CLR REL_DERING
CALL LDELAY
JB PHOOK7, WAIT7S
SJMP EX7W

WAIT7S: JNB SIGN2, WAIT7A
SJMP EXIT7

EX7W:
JB BITSP, NO7K
SETB REL_TELP7
SJMP GEN7

NO7K: CALL NO_DEFAULT
CALL PILIH
CLR REL_TELP7
GEN7: CLR REL_DERING
CLR REL_SPEAK
CALL LDELAY

WAIT7B: CALL LDELAY
WAIT7C: JNB PHOOK7, WAIT7B
EXIT7: CALL STAND_BY
CLR REL_SPEAK
MOV A, #0AH
CALL KIRIM
CLR BITSP
RET

NO8: CJNE A, #8, EX_
CALL INIT_TIMER0
MOV ACC2, #5
SETB TR0
CLR SIGN2
SETB REL_TELP8
WAIT8A: SETB REL_DERING
CALL LDELAY
CALL LDELAY
;CALL LDELAY
JB PHOOK8, WAIT8AD
SJMP EX8W
WAIT8AD:
CLR REL_DERING
CALL LDELAY

JB PHOOK8, WAIT8S
SJMP EX8W

WAIT8S: JNB SIGN2, WAIT8A
SJMP EXIT8

EX8W:
JB BITSP, NO8K
SETB REL_TELP8
SJMP GEN8

NO8K: CALL NO_DEFAULT
CALL PILIH
CLR REL_TELP8

GEN8: CLR REL_DERING
CLR REL_SPEAK
CALL LDELAY

WAIT8B: CALL LDELAY
WAIT8C: JNB PHOOK8, WAIT8B
EXIT8: CALL STAND_BY

CLR REL_SPEAK
MOV A, #0AH
CALL KIRIM
CLR BITSP

EX_: RET

PILIH: MOV A, 33H
PIL1: CJNE A, #1, PIL2
CLR REL_TELP1
RET

PIL2: CJNE A, #2, PIL3
CLR REL_TELP2
RET

PIL3: CJNE A, #3, PIL4
CLR REL_TELP3
RET

PIL4: CJNE A, #4, PIL5
CLR REL_TELP4
RET

PIL5: CJNE A, #5, PIL6
CLR REL_TELP5
RET

PIL6: CJNE A, #6, PIL7
CLR REL_TELP6
RET

PIL7: CJNE A, #7, PIL8
CLR REL_TELP7



```
RET
PIL8: CJNE A,#8,EXP
CLR REL_TELP8
EXP: RET
```

```
INIT_TIMER0:
MOV TH0,#HIGH(NILAI2)
MOV TL0,#LOW(NILAI2)
CLR TF0
MOV ACC1,#18
MOV ACC2,#7
RET
```

```
KIRIM: MOV SBUF,A
JNB TI,$
CLR TI
RET
```

```
DELAY: MOV R2,#0
DELAY1: MOV R3,#29H
DJNZ R3,$
DJNZ R2,DELAY1
RET
```

```
LDELAY: MOV R4,#20
LDELAY1: CALL DELAY
DJNZ R4,LDELAY1
RET
```

```
XLDELAY: MOV R6,#33
XLDELAY1: CALL LDELAY
DJNZ R6,XLDELAY1
RET
```

```
STAND_BY:
CLR REL_TELP1
CLR REL_TELP2
CLR REL_TELP3
CLR REL_TELP4
CLR REL_TELP5
CLR REL_TELP6
CLR REL_TELP7
CLR REL_TELP8
CLR REL_DERING
RET
```

```
NO_DEFAULT:
```

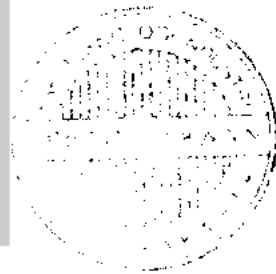
```
SETB REL_TELP1
SETB REL_TELP2
SETB REL_TELP3
SETB REL_TELP4
SETB REL_TELP5
SETB REL_TELP6
SETB REL_TELP7
SETB REL_TELP8
CLR REL_DERING
RET
```

```
INT_TIMER0:
PUSH PSW
PUSH ACC
CLR TR0
CLR TF0
MOV TH0,#HIGH(NILAI2)
MOV TL0,#LOW(NILAI2)
DJNZ ACC1,EX_TIMER0
MOV ACC1,#18
DJNZ ACC2,EX_TIMER0
MOV ACC2,#5
SETB SIGN2
POP ACC
POP PSW
RETI
```

```
EX_TIMER0:
SETB TR0
POP ACC
POP PSW
RETI
```

```
DET_DTMF_UTAMA:
MOV A,#04H
CALL KIRIM
CALL INIT_TIMER0
MOV ACC2,#17
SETB TR0
SETB ET0
CLR SIGN2
```

```
WAITD2A: JNB SIGN2,WAITD2
CLR SIGN2
MOV A,#0FH
CALL KIRIM
```



```
CLR TR0
CALL STAND_BY
CLR REL_SPEAK
RET
```

```
WAITD2: JNB STD2, WAITD2A
```

```
DTMF2: MOV A, P0
        ANL A, #11110000B
        SWAP A
        CALL KIRIM
:       SETB REL_DERING
        CLR REL_SPEAK
        CALL TUJUAN2
        CLR BUSY_
EX_DIAL: RET
```

```
TUJUAN2:
NO1_: CJNE A, #1, NO2_
        CALL STAND_BY
:       SETB REL_DERING
        SETB REL_TELP1
        CLR REL_SPEAK
        CALL INIT_TIMER0
        MOV ACC2, #5
        SETB TR0
        SETB ET0
        CLR SIGN2
```

```
WAITIA_:
        SETB REL_DERING
        CALL LDELAY
        CALL LDELAY
        JB PHOOK1, WAITID_
        SJMP EXIW_
```

```
WAITID_:
        CLR REL_DERING
        CALL LDELAY
        JB PHOOK1, WAITIS_
        SJMP EXIW_
```

```
WAITIS_:
        JNB SIGN2, WAITIA_
        CLR TR0
        MOV A, #0FH
        CALL KIRIM
        SJMP EX_T1_
```

```
EXIW_:
```

```
SETB REL_SEMU
CLR REL_DERING
SETB REL_SPEAK
SETB REL_TELPI
```

```
WAIT1B_: CALL LDELAY
WAIT1C_: JNB PHOOK1,WAIT1B_
MOV A,#0AH
CALL KIRIM
```

```
EX_T1_: SETB REL_SEMU
CALL STAND_BY
CLR REL_SPEAK
RET
```

```
-----
NO2_: CJNE A,#2,NO3_
CALL STAND_BY
: SETB REL_DERING
SETB REL_TELP2
CLR REL_SPEAK
CALL INIT_TIMER0
MOV ACC2,#5
SETB TR0
SETB ET0
CLR SIGN2
```

```
WAIT2A_: SETB REL_DERING
CALL LDELAY
CALL LDELAY
JB PHOOK2,WAIT2D_
SJMP EX2W_
```

```
WAIT2D_: CLR REL_DERING
CALL LDELAY
JB PHOOK2,WAIT2S_
SJMP EX2W_
```

```
WAIT2S_: JNB SIGN2,WAIT2A_
CLR TR0
MOV A,#0FH
CALL KIRIM
SJMP EX_T2_
```

```
EX2W_: SETB REL_SEMU
CLR REL_DERING
```

```
SETB REL_SPEAK
SETB REL_TELP2
```

```
WAIT2B_ : CALL LDELAY
WAIT2C_ : JNB PHOOK2.WAIT2B_
          MOV A,#0AH
          CALL KIRIM
```

```
EX_T2_ : SETB REL_SEMU
          CALL STAND_BY
          CLR REL_SPEAK
          RET
```

```
-----
NO3_ : CJNE A,#3,NO4_
      CALL STAND_BY
;     SETB REL_DERING
      SETB REL_TELP3
      CLR REL_SPEAK
      CALL INIT_TIMER0
      MOV ACC2,#5
      SETB TR0
      SETB ET0
      CLR SIGN2
```

```
WAIT3A_ : SETB REL_DERING
          CALL LDELAY
          CALL LDELAY
          JB PHOOK3.WAIT3D_
          SJMP EX3W_
```

```
WAIT3D_ : CLR REL_DERING
          CALL LDELAY
          JB PHOOK3.WAIT3S_
          SJMP EX3W_
```

```
WAIT3S_ : JNB SIGN2.WAIT3A_
          CLR TR0
          MOV A,#0FH
          CALL KIRIM
          SJMP EX_T3_
```

```
EX3W_ : SETB REL_SEMU
        CLR REL_DERING
        SETB REL_SPEAK
```


SETB REL_TELP3

WAIT3B_: CALL LDELAY
WAIT3C_: JNB PHOOK3, WAIT3B_
MOV A, #0AH
CALL KIRIM

EX_T3_:
SETB REL_SEMU
CALL STAND_BY
CLR REL_SPEAK
RET

NO4_: CJNE A, #4, NO5_
CALL STAND_BY
SETB REL_DERING
SETB REL_TELP4
CLR REL_SPEAK
CALL INIT_TIMER0
MOV ACC2, #5
SETB TR0
SETB ET0
CLR SIGN2

WAIT4A_:
SETB REL_DERING
CALL LDELAY
CALL LDELAY
JB PHOOK4, WAIT4D_
SJMP EX4W_

WAIT4D_:
CLR REL_DERING
CALL LDELAY
JB PHOOK4, WAIT4S_
SJMP EX4W_

WAIT4S_:
JNB SIGN2, WAIT4A_
CLR TR0
MOV A, #0FH
CALL KIRIM
SJMP EX_T4_

EX4W_:
SETB REL_SEMU
CLR REL_DERING
SETB REL_SPEAK
SETB REL_TELP4



```
WAIT4B_ : CALL LDELAY
WAIT4C_ : JNB PHOOK4,WAIT4B_
          MOV A,#0AH
          CALL KIRIM
```

```
EX_T4_ :
          SETB REL_SEMU
          CALL STAND_BY
          CLR REL_SPEAK
          RET
```

```
-----
NO5_ : CJNE A,#5,NO6_
          CALL STAND_BY
:      SETB REL_DERING
          SETB REL_TELP5
          CLR REL_SPEAK
          CALL INIT_TIMER0
          MOV ACC2,#5
          SETB TR0
          SETB ET0
          CLR SIGN2
```

```
WAIT5A_ :
          SETB REL_DERING
          CALL LDELAY
          CALL LDELAY
          JB PHOOK5,WAIT5D_
          SJMP EX5W_
```

```
WAIT5D_ :
          CLR REL_DERING
          CALL LDELAY
          JB PHOOK5,WAIT5S_
          SJMP EX5W_
```

```
WAIT5S_ :
          JNB SIGN2,WAIT5A_
          CLR TR0
          MOV A,#0FH
          CALL KIRIM
          SJMP EX_T5_
```

```
EX5W_ :
          SETB REL_SEMU
          CLR REL_DERING
          SETB REL_SPEAK
          SETB REL_TELP5
```

```
WAIT5B_ : CALL LDELAY
WAIT5C_ : JNB PHOOK5,WAIT5B_
```

```
MOV A,#0AH
CALL KIRIM
EX_T5_:
SETB REL_SEMU
CALL STAND_BY
CLR REL_SPEAK
RET
```

```
NO6_: CJNE A,#6,NO7_
CALL STAND_BY
SETB REL_DERING
SETB REL_TELP6
CLR REL_SPEAK
CALL INIT_TIMER0
MOV ACC2,#5
SETB TR0
SETB ET0
CLR SIGN2
```

```
WAIT6A_:
SETB REL_DERING
CALL LDELAY
CALL LDELAY
JB PHOOK6.WAIT6D_
SJMP EX6W_
```

```
WAIT6D_:
CLR REL_DERING
CALL LDELAY
JB PHOOK6.WAIT6S_
SJMP EX6W_
```

```
WAIT6S_:
JNB SIGN2.WAIT6A_
CLR TR0
MOV A,#0FH
CALL KIRIM
SJMP EX_T6_
```

```
EX6W_:
SETB REL_SEMU
CLR REL_DERING
SETB REL_SPEAK
SETB REL_TELP6
```

```
WAIT6B_: CALL LDELAY
WAIT6C_: JNB PHOOK6.WAIT6B_
MOV A,#0AH
```

```
CALL KIRIM
EX_T6_:
SETB REL_SEMU
CALL STAND_BY
CLR REL_SPEAK
RET
```

```
-----
NO7_: CJNE A,#7,NO8_
CALL STAND_BY
: SETB REL_DERING
SETB REL_TELP7
CLR REL_SPEAK
CALL INIT_TIMER0
MOV ACC2,#5
SETB TR0
SETB ET0
CLR SIGN2
```

```
WAIT7A_:
SETB REL_DERING
CALL LDELAY
CALL LDELAY
JB PHOOK7,WAIT7D_
SJMP EX7W_
```

```
WAIT7D_:
CLR REL_DERING
CALL LDELAY
JB PHOOK7,WAIT7S_
SJMP EX7W_
```

```
WAIT7S_:
JNB SIGN2,WAIT7A_
CLR TR0
MOV A,#0FH
CALL KIRIM
SJMP EX_T7_
```

```
EX7W_:
SETB REL_SEMU
CLR REL_DERING
SETB REL_SPEAK
SETB REL_TELP7
```

```
WAIT7B_: CALL LDELAY
WAIT7C_: JNB PHOOK7,WAIT7B_
MOV A,#0AH
CALL KIRIM
```

```
EX_T7_:
    SETB REL_SEMU
    CALL STAND_BY
    CLR REL_SPEAK
    RET
```

```
-----
NO8_: CJNE A,#8,EX_NO2
    CALL STAND_BY
:    SETB REL_DERING
    SETB REL_TELP8
    CLR REL_SPEAK
    CALL INIT_TIMER0
    MOV ACC2,#5
    SETB TR0
    SETB ET0
    CLR SIGN2
```

```
WAIT8A_:
    SETB REL_DERING
    CALL LDELAY
    CALL LDELAY
    JB PHOOK8,WAIT8D_
    SJMP EX8W_
```

```
WAIT8D_:
    CLR REL_DERING
    CALL LDELAY
    JB PHOOK8,WAIT8S_
    SJMP EX8W_
```

```
WAIT8S_:
    JNB SIGN2,WAIT8A_
    CLR TR0
    MOV A,#0FH
    CALL KIRIM
    SJMP EX_T8_
```

```
EX8W_:
    SETB REL_SEMU
    CLR REL_DERING
    SETB REL_SPEAK
    SETB REL_TELP8
```

```
WAIT8B_: CALL LDELAY
WAIT8C_: JNB PHOOK8,WAIT8B_
    MOV A,#0AH
    CALL KIRIM
```

```
EX_T8_:
    SETB REL_SEMU
```



```
CALL STAND_BY
CLR REL_SPEAK
EX_NO2: RET
```

```
INT_EX0: PUSH PSW
        PUSH ACC
        PUSH 02H
        PUSH 03H
        PUSH 04H
        PUSH 06H
        DJNZ SUM_EX,EX_EX0
```

```
        JB BUSY_EX,EX_EX0
        MOV A,#02H
        CALL KIRIM
        MOV A,#0EH
        CALL KIRIM
        SETB SIGN3
        CALL LDELAY
        JNB BUSY_EX,EX_EX0
        SETB BUSY_
        CALL XLDELAY
        MOV A,#0FH
        CALL KIRIM
        CLR SIGN3
```

```
EX_EX0: POP 06H
        POP 05H
        POP 04H
        POP 02H
        POP ACC
        POP PSW
        RETI
```

```
SERINT: JB RI,RECEIVED
        RETI
```

```
RECEIVED: PUSH PSW
          PUSH ACC
          MOV A,SBUF
          CLR RI
          CJNE A,#0FH,EX_SERINT
```

```
EX_SERINT:
```

POP ACC
POP PSW
RETI

DATA_SEV: DB 0FFH,0F9H,0A4H,0B0H,99H,92H,82H,0F8H,80H,90H,0C0H
END



```
=====
: PABX - DISPLAY PROGRAM
: Programmed by Herry Ibnu Nurcahyo
=====
```

```
START_ISD BIT P3.2
RST_ISD   BIT P3.3
```

```
ORG 0H
SJMP START
```

```
ORG 23H
JMP SERINT
```

```
ORG 30H
START:
MOV SP,#8H
MOV TMOD,#20H
MOV TH1,#0FDH
MOV SCON,#50H
SETB TRI
SETB EA
SETB ES
: SETB ET0
SETB RST_ISD
CALL DELAY
CLR RST_ISD
```

```
MAIN:
```

```
SJMP $
```

```
DELAY: MOV R2,#0
DELAY1: MOV R3,#29H
        DJNZ R3,$
        DJNZ R2,DELAY1
        RET
```

```
LDELAY: MOV R4,#0
LDELAY1: CALL DELAY
        DJNZ R4,LDELAY1
        RET
```

```
ISD_START:
        SETB RST_ISD
        CALL DELAY
        CLR RST_ISD
        SETB START_ISD
```



```
CALL DELAY
CLR START_ISD
CALL DELAY
SETB START_ISD
RET
```

```
ISD_START2:
SETB START_ISD
CALL DELAY
CLR START_ISD
CALL DELAY
SETB START_ISD
RET
```

```
INT_DERING:
PUSH PSW
PUSH ACC
MOV P1,#1
MOV P0,#1
POP ACC
POP PSW
RETI
```

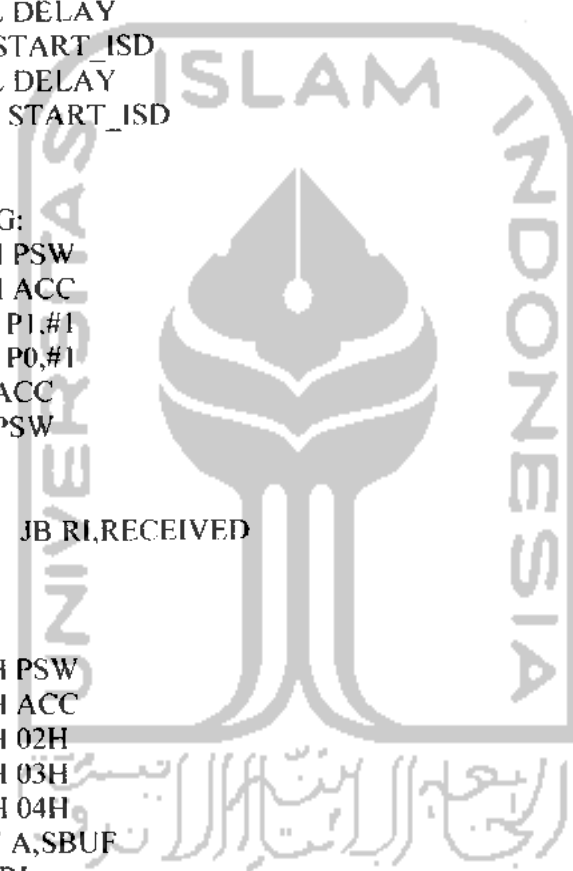
```
SERINT: JB RI,RECEIVED
RETI
```

```
RECEIVED:
PUSH PSW
PUSH ACC
PUSH 02H
PUSH 03H
PUSH 04H
MOV A,SBUF
CLR RI
MOV 30H,A
```

```
ISD: CJNE A,#0EH,ISD2
CALL ISD_START
JMP EX_SER
```

```
ISD2: CJNE A,#0FH,NISD
MOV P0,#86H
CALL ISD_START2
JMP EX_SER
```

```
NISD:
```



```
ANL A,#00001111B
JZ NPENGIRIM
MOV DPTR,#DATA_SEV
MOVC A,@A+DPTR
MOV P0,A
SJMP EX_SER
```

```
NPENGIRIM:
MOV A,30H
SWAP A
MOV DPTR,#DATA_SEV
MOVC A,@A+DPTR
MOV P1,A
```

```
EX_SER: POP 04H
POP 03H
POP 02H
POP ACC
POP PSW
RETI
```

```
PROSES_EXTERNAL:
RET
```

```
KIRIM: MOV SBUF,A
JNB TI,$
CLR TI
RET
```

```
DATA_SEV: DB 0FFH,0F9H,0A4H,0B0H,99H,92H,82H,0F8H,80H,90H,0C0H
END
```

