Application Based Analysis and Design Using Microcontroller

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Abstract - Now day’s automation systems are very common to each and every field of human life. Humans want to lead a leisure full life. The theme work of this paper is also based on this idea. The idea is to automate the appliances using a normal mobile phone system. These paper fistly commands a system which governs a system which gives the command to appliances to either switch on or off. The system works on some common day’s technologies which are mobile networking using GSM or CDMA, Duel Tone Multiple Frequency and basic encoding and decoding techniques. In this project we try to give the same prototype for this type of trains. We are using microcontroller 89c51 as CPU. And secondly the motion of the train is controlled by the stepper motor, for displaying the message in the train we are using intelligent LCD display of two lines. The train is designed for three stations, named as A, B and C. The stoppage time for every station is 3sec and time to travel from one station to another is 6sec, there is a LCD display for showing various messages in the train for passengers. There are indicators, which are used to show the train direction i.e. UP path and DOWN path. before stopping at the station, the train blows the buzzer. it also includes an emergency brakes system due to which the train stops as soon as the brakes are applied and resumes journey when he emergency situation is over.

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Abstract - Now day’s automation systems are very common to each and every field of human life. Humans want to lead a leisure full life. The theme work of this paper is also based on this idea. The idea is to automate the appliances using a normal mobile phone system. These paper firstly commands a system which governs a system which gives the command to appliances to either switch on or off. The system works on some common day’s technologies which are mobile networking using GSM or CDMA, Dual Tone Multiple Frequency and basic encoding and decoding techniques. In this project we try to give the same prototype for this type of trains. We are using microcontroller 89c51 as CPU. And secondly the motion of the train is controlled by the stepper motor, for displaying the message in the train we are using intelligent LCD display of two lines. The train is designed for three stations, named as A, B and C. The stoppage time for every station is 3sec and time to travel from one station to another is 6sec, there is a LCD display for showing various messages in the train for passengers. There are indicators, which are used to show the train direction i.e. UP path and DOWN path .before stopping at the station, the train blows the buzzer, it also includes an emergency brakes system due to which the train stops as soon as the brakes are applied and resumes journey when he emergency situation is over.

I. Introduction

In the paper two mobiles are employed one at user side which is carried by the user and second at the receiver part. At receiver part the mobiles DTMF output is fed through the ear phone jack to the receiver circuit. When the DTMF tone is fed to the receiver circuit it converts the analog DTMF signal to digital output and this digital output is fed to the Microcontroller 892051. In Microcontroller a specific code is written to process the details of the digital output from the decoder chip MT8870. For every input from MT8870 there is a specific command is written in the Microcontroller 892051 and corresponding to the input code makes one of the output pin of Microcontroller 892051 high which commands the relay driver IC chip ULN2803. As according to the input from Microcontroller 892051 the relay makes only one of the output pin high among all. fig (1) describes the circuit of the designed system. Basically a receiver which used to:

1) Receive DTMF tone send by the Transmitter Mobile
2) Analog DTMF tone to Digital data generator
3) Microprocessor Unit (AT892051)
4) Relay driver IC (ULN2803)

Circuit Diagram:

Fig 1: Circuit diagram of Mobile Automation circuit
II. WORKING

Before starting with Motorola IC MT8870 it should be configured properly. Power supply is connected on +5v on pin 18 and ground on pin 9. The DTMF input is supplied to the pin 3 through a resistance of 100k so that a proper amount of current is drawn to the pin 3 for operating the IC. Crystal oscillator of frequency 3.57MHz is deployed between pin 7 and pin 8. Output is taken from pin 11, 12, 13, 14 through pull up resistors.

III. MICROCONTROLLER 89C51

The use of microcontroller ensures the reliability of the system. Before starting with the working of Microcontroller 892051 it should be configured properly. Pin 20 is connected with Vcc and Pin 10 with Ground. An oscillator of 11.0592 MHz is deployed between the pin 4 and pin 5. Input from the MT8870 is fed to the pin 6, 7, 8, 9 which are general purpose input/output pins. These pins are also considered as Port 3, so while programming the controller programmer consider input Port as P3 here. And output is taken from general purpose input/output Port 1. The out put is a 8 bit output so that it can control the eight pins of relay driver IC.

The Microcontroller code according to the input of MT8870 is given as:

Coding of motion of the train is controlled by the stepper motor, for displaying the message in the train we are using intelligent LCD display of two lines.

The coding of the metro train prototype is given in the assembly language. The Programmer main routines are the routines for running of stepper motor in forward
Direction and in reverse direction. The routines for this purpose are Stepper f and stepper b. The routines display and command are used in conjunction with LCD display. Program for a stepper having connected at p2 (from p2.0 to p2.3) & to show

Message on the LCD

data e q u p 1
busy e q u p 1.7
r s e q u p 3.5
r w e q u p 3.4
en e q u p 3.3
B z r e q u p 0.2
led f e q u p 0.0
led b e q u p 0.1

org 400h
show0: db 'Welcome To All','0'
show1: db 'Current Station1','0'
show2: db 'Next Station','0'
show3: db 'A','0'
show4: db 'B','0'
Show5: db 'C','0'
org 0000h
a j m p main
org 0003h
test: m o v c,p3.2
j n c h a l t
set b b z r
r e t i
halt:
c l r b z r ;till zero blow on the b z r
a j m p test
main:

mo v ie,#00h
set b ea
set b ex0
here:
mo v p2,#00h
a call I n i
m o v dptr,#show0
a call read
c l r led f ;p1.0
a call delay
m o v a,#01h
a call command; Now make memory clear
cursor home
m o v dptr,#show1
a call read
set b ex0 ;#############################
mo v a,#0c0h
a call command
m o v dptr,#show3
a call read
a call delay ;Stopage1 time 3 sec A
a call delay
c l r b z r
a call delay
m o v a,#01h
a call command
m o v dptr,#show2
a call read
m o v a,#0c0h
a call command
m o v dptr,#show4
a call read
set b b z r
a call delay 10
a call stepper f
m o v a,#01h
a call command
m o v dptr,#show1
a call read
m o v a,#0c0h
a call command
m o v dptr,#show4
a call read
a call delay ;Stopage2 time 3 sec shsar
a call delay
c l r b z r
a call delay
m o v a,#01h
a call command
m o v dptr,#show2 ;display ne s h a r
a call read
m o v a,#0c0h
a call command
m o v dptr,#show4
a call read
m o v a,#01h
a call command
m o v dptr,#show2 ;display ne
a call read
m o v a,#0c0h
a call command
m o v dptr,#show5
a call read
set b b z r
a call delay 10
a call stepper f
m o v a,#01h
a call command
m o v dptr,#show1
a call read
m o v a,#0c0h
a call command
m o v dptr,#show4
a call read
m o v a,#01h
a call command
m o v dptr,#show2 ;display ne
a call read
m o v a,#0c0h
a call command
m o v dptr,#show4
a call read
a call delay ;Stopage2 time 3 sec shsar
a call delay
c l r b z r
a call delay
m o v a,#01h
a call command
m o v dptr,#show2 ;display ne r o o r
a call read
m o v a,#0c0h
a call command
m o v dptr,#show3
a call read
set b b z r
a call delay 10
a call stepper b
m o v a,#01h
a call command
m o v dptr,#show1
a call read
m o v a,#0c0h
a call command
m o v dptr,#show1
a call read
m o v a,#0c0h
a call command
m o v dptr,#show1
a call read
m o v a,#0c0h
a call command
m o v dptr,#show1
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(a call read
mov a,#0c0h
a call command
mov dptr,#show3
a call read
set b led b ;p1.1
jmp here
;routine for stepper motor
Delay Routine ;one sec delay
delay:
push acc
push 00h
push 01h
push p0
push p1
mov r0,#0eh
loop r:
mov a,#0ffh
loop b:
mov b,#0ffh
loop a: djnz b,loop b
djnz 0f0h,loop a
djnz r0,loop r
pop p1
pop p0
pop 01h
pop 00h
pop acc
ret

;delay stepper
delays:
push acc
push p1
mov a,#88h
mov r1,#04h
loop1: mov r0,#0e0h
loop: mov p2,a
acall delays
rra
djnz r0,loop
djnz r1,loop1
mov p2,#0e0h
mov p1,#00h
mov p0,#01h
mov p1,#00h
acall display
inc dptr
jmp next
down:
ret

;============== Routine to read data from prog mem
read:
next: clr a
mov c a,@a+dptr
cjne a,#'0',aga
jsmp down
aga: acall display
inc dptr
jmp next
down:
ret

;=============== stepper routine
stepper f:
push acc
push p1
mov a,#88h
mov r1,#04h
loop1: mov r0,#0e0h
loop: mov p2,a
acall delays
rra
djnz r0,loop
djnz r1,loop1
mov p2,#0e0h
mov p1,#00h
mov p0,#01h
mov p1,#00h
acall display
inc dptr
jmp next
down:
ret

;============== stepper routine
Coding of mobile networking using GSM or CDMA, Dual Tone Multiple Frequency and basic encoding and decoding techniques.

```
pop acc
ret

stepper b:
push acc
push p1
mov a,#88h
mov r1,#04h
loop12:
mov r0,#0e0h
loop0: mov p2,a
a call delays
rla
djnz r0,loop0
djnz r1,loop12
pop p1
pop acc
ret

,a call command
mov a,#80h
a call command
ret

command:
a call ready
mov d ata,#a
clr rs
clr rw
set b en
clr en
ret
display:
a call ready
mov d ata,#a
set brs
clr rw
set b en
clr en
ret

ready:
clr en
mov data,#ffh
clr rs
set brw
wait: clr en
set b en
j b busy, wait
clr en
ret

End
```

Coding of mobile networking using GSM or CDMA, Dual Tone Multiple Frequency and basic encoding and decoding techniques.
IV. RESULTS AND CONCLUSION

The whole system is perfectly developed and tested under the laboratory. This system is very cost effective and easy to deploy in the existing systems. This system adds one more degree of comfort to the human luxury list.

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