

LIBRARY MANAGEMENT SYSTEM

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ABSTRACT: Library is a huge collection of books. The proper arrangement of books in given collection of order that makes it simple for the user to locate a specific book. This process used in large libraries having a huge collections of books. Our project titled Library Management System is Library Management software for monitoring and controlling the transactions in a library. The project “Library Management System” is developed in embedded system , which mainly focuses on basic operations in a library like adding new books, and updating new information, and number of books in a shelf. This project of “LIBRARY MANAGEMENT” gives us the complete information about the number of books in library. We can enter the record of new books and retrieve the details of books available in the library. We can check how many books are issued and stock available in the library. Overall this project of ours is being developed to help the students as well as staff of

library to maintain the library in the best way possible and also reduce the human efforts.

1 INTRODUCTION:

Maintaining book records and data regarding availability of number of books in the library is one of the major activities of the librarian. This ‘LIBRARY MANAGEMENT SYSTEM’ will give a brief idea to a librarian regarding availability of number of books in the library. Our project titled Library Management System is Library Management software for monitoring and controlling the transactions in a library. The project “Library Management System” is developed in embedded system , which mainly focuses on basic operations in a library like adding new books, and updating new information, and number of books in a shelf. This project of “LIBRARY MANAGEMENT” gives us the complete information about the number of books in library. We can enter

the record of new books and retrieve the details of books available in the library. We can check how many books are issued and stock available in the library. In this project we identify the need for computer based Library Management Systems.

2. EXISTING SYSTEM:

2.1 EXISTING SYSTEM

A library is an ideal candidate for an IT solution, given the huge amounts of data it has to deal with on a day-to-day basis. Library is a place that enters to the needs of book lovers. In the current system all the details of the books in the library are maintained in the books. If the management want to search a record of the book they has to search all the records. If the management wants to add a new book in to the database they have to search to which category the book belongs to. User has to know the availability of the book before issuing to the student. Student must come to the library to know the status of the book. If the book is not available the student will make it as advance booking. In the current system there is a malfunctioning of that feature, because one student can use advance booking option one or more times for the same book, and the person who had the book can also use the advance booking feature for the same book. If the students want to know the status of the book they have to come to the library and they will know the status. The whole process is now manually controlled. This requires maintaining the records of the queries coming from the students in the paper.

2.2 LIMITATIONS IN EXISTING SYSTEM

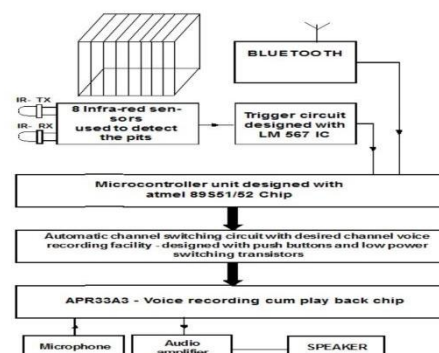
Maintaining the data in excel sheets and files is very hard to remember the file names in which the required data is feed. No easy access to the required queries. Data redundancy, inconsistency, lot of human work need to be done in order analyze the details present in the excel sheets. It leads to wastage of time. No timely response to the end users.

3. PROPOSED SYSTEM:

This proposed system is an library management system, which on detecting the number books in a shelves, which will give an accurate information about transactions of books , in addition it gives an voice output about the number books. It is implemented using the components like 8051 microcontroller, IR sensors, bluetooth module, voice playback speaker, sound or audio microphone, voltage step-down transistor, voltage regulator. All components are interfaced with the 8051Micro Controller and works by automation as per uploaded code

4. BLOCK DIAGRAM

Fig 1 Block diagram



5. COMPONENTS:

5.1 MICROPHONE AND ITS AMPLIFIER:

The microphone is a device, which converts the variations of sound pressure in a sound wave into corresponding electrical variations in an electrical circuit. The electrical variations so produced are in the AF range and are further amplified by means of an AF amplifier to make them suitable for feeding loud speakers, recording heads and for modulating carrier waves. Many types of microphones are available for different applications, but here in this project work condenser microphone is used. This is very sensitive microphone, there by it is used to pick-up weak audio signals also. The output of the Microphone as it is can not be used to drive any thing because of weak sound signal, the signal must be amplified. Here the application is to transmit the voice through carrier signal, signal amplification in higher wattage is not required, and therefore one small pre-amplifier circuit is constructed with two low power NPN transistors. The operation of a transistor as an amplifier is based on the fact that base current in a transistor can control the collector current. Here the base current is varied depending up on the sound signal strength produced by the microphone. If any body shouts loudly in front of the microphone, more base current will be produced. In general the base current can be varied by variations of forward bias and this will produce corresponding variations in the collector current.

5.2 MICROCONTROLLER:

A Micro controller consists of a powerful CPU tightly coupled with memory, various I/O interfaces such as serial port, parallel port timer or counter, interrupt controller, data acquisition interfaces-Analog to Digital converter, Digital to Analog converter, integrated on to a single silicon chip. If a system is developed with a microprocessor, the designer has to go for external memory such as RAM, ROM, EPROM and peripherals. But controller is provided all these facilities on a single chip. Development of a Micro controller reduces PCB size and cost of design. One of the major differences between a Microprocessor and a Micro controller is that a controller often deals with bits not bytes as in the real world application. Intel has introduced a family of Micro controllers called the MCS-51. The microcontroller plays the major role in any embedded project. In this my project we use two microcontrollers they are made by the ATMEL Company. That is AT89S52.

NECESSITY OF MICROCONTROLLERS

Microprocessors brought the concept of programmable devices and made many applications of intelligent equipment. Most applications, which do not need large amount of data and program memory, tended to be costly.

The microprocessor system had to satisfy the data and program requirements so; sufficient RAM and ROM are used to satisfy most applications. The peripheral control equipment also had to be satisfied. Therefore, almost all-peripheral chips were used in the design. Because of these

additional peripherals cost will be comparatively high.



Fig Microcontroller

5.3 AUDIO AMPLIFIER:

An amplifier is an electronic circuit that produces an enlarged version of a small signal fed in to the circuit. The terminals where small signals are applied are called input, where the enlarged signals present are called output. The word audio pertains to the sense of hearing in human beings. Audio frequencies are pressure variations in air which are within the hearing capability of a human ear. The range of audio frequencies varies with age and the individual. The sound frequencies as such cannot be amplified by electronic amplifiers. These sound frequencies must be converted in to electrical frequencies or vibrations before these can be amplified. This conversion from sound pressure variations to equivalent electrical vibrations is effected by means of a microphone. In general audio amplifiers are, therefore, amplifiers which are suitable for the amplification of electrical frequencies lying within the audio frequency range of 20Hz and 20,000 Hz. Audio frequency amplifiers are mainly used in the output stages of radio receivers

and sound sections of TV receivers for driving loudspeakers to produce sound. AF amplifiers are also used in record players, cassette players, tape recorders, etc. The audio amplifier designed in this project work falls under the subject of transformer coupling amplifier & it is configured in push-pull mode of amplification. This is very popular method; the inter-stage transformer not only provides a coupling method but also provides matching impedance for the first & output stages. Proper impedance matching ensures the maximum transfer of power from one stage to the next. Inter-stage transformer also provides the required isolation between output & input stages.

5.4 VOLTAGE REGULATOR:

3-Terminal 1A Positive Voltage Regulator

The MC78XX/LM78XX/MC78XXA series of three terminal positive regulators are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

Features

- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection

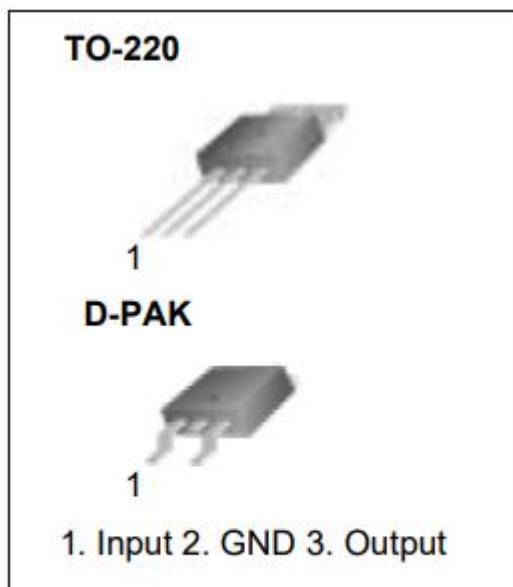


Fig Voltage Regulator

5.5 VOICE RECORD CUM PLAYBACK CHIP:

The circuit is constructed with APR 9600 IC, it is a single chip voice recorder and play back device from Aplus integrated circuits and its makes use of a proprietary analogue storage technique implemented using flash non volatile memory process.

5.5.1 Record Mode

The LED glows when the IC records the voice obtained through the microphone. A single voice message up to 5 seconds can be recorded. The IC remains in the recorded mode as long as the RecL pin 27 is grounded through switch. Recoding will be terminated with the last memory when 20 seconds is over. The Speaker driver will automatically mutes in the recording mode. By changing the value of the OscR resistor R1 it is possible to increase the recording period as follows:

- A. R1 52K 20 Sec.
- B. R1 67 K 24 Sec
- C. R1 89 K 30 Sec.

5.5.2 Play back Mode

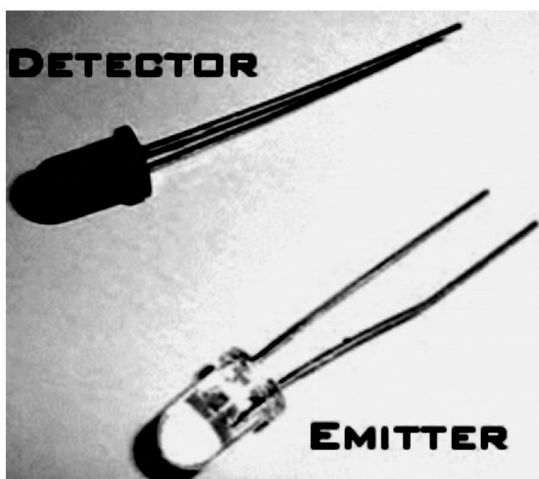
Playback always starts from the beginning of the message. The chip is in playback mode after the /PlayE pin pulses low (edge-activated). Playback will stop immediately when the /PlayE pin pulses low a second time. If the newly recorded message is shorter than the previously recorded message, the remaining portion of the previous message will not be played after the new message is played back. The input preamplifier, AGC, and main amplifier circuits are disabled during playback. By pressing the play back switch, the play mode starts from the beginning of the message. The input section will be muted during play back.

5.6 SPEAKER:

A loud speaker is the voice of any electronic entertainment equipment and, as such, it should be able to reproduce, as faithfully as possible, the original sound from the broad casting studios. A good loud speaker should be able to reproduce all sounds equally well irrespective of their amplitude, frequency and waveform. Sound waves are produced in air by a vibrating body. In the case of a loud speaker, the vibrating body is a cone or a diaphragm, which is attached to a driving unit, which converts electrical currents into Mechanical motion for the diaphragm to vibrate and produce sound waves containing the acoustical energy.

5.7 IR SENSOR:

The applications and advantages of infrared sensors are plenty; mostly these devices are utilized for various types of security systems by implementing proximity detection theme. Other important applications are for counting objects, or counting revolutions of a rotating object. In any concept, the proximity detection package contains two



devices, namely infrared light emitting

diode (IR LED) and infrared light/signal detector (IR sensor). The IR LED is always ON, meaning that this device is constantly emitting light and the sensor is detecting this light. The sensors can be interfaced with trigger circuit to generate logic high/low pulses depending up on the interruptions created by any object. This design of the circuit is suitable many applications. However this design is more power consuming and is not optimized for high ranges, in this design, range can be from 1 to 10 cm, depending on the ambient light conditions. The following are the few applications.

Fig IR sensor

6 ASSEMBLY LANGUAGE PROGRAMING

```
CNT DATA 30H
CNT1 DATA 31H
CNT2 DATA 32H
CNT3 DATA 33H
CNT4 DATA 34H
CNT5 DATA 35H
CNT6 DATA 36H
CNT7 DATA 37H
CNT8 DATA 38H
```

```
BK1 BIT P1.0
BK2 BIT P1.1
BK3 BIT P1.2
BK4 BIT P1.3
BK5 BIT P1.4
BK6 BIT P1.5
BK7 BIT P1.6
BK8 BIT P1.7
```

```

VC1 BIT P2.0
VC2 BIT P2.1
VC3 BIT P2.2
VC4 BIT P2.3
VC5 BIT P2.4
VC6 BIT P2.5
VC7 BIT P2.6
VC8 BIT P2.7

KEY BIT P3.2
  ORG 0000H
  LJMP RT
RT:
  MOV SCON,#50H
  MOV TMOD,#20H
  MOV TH1,#0FDH
  SETB TR1
CLR RI
  mov p2,#0FFh //VOICE CHIP
  MOV CNT,#00H

MAIN:JB KEY,NX
  LJMP OUT
NX: JNB BK1,NX1
  MOV CNT1,#00H
SJMP NX2
NX1: MOV CNT1,#01H

NX2: JNB BK2,NX3
  MOV CNT2,#00H
SJMP NX4
NX3: MOV CNT2,#01H

NX4: JNB BK3,NX5
  MOV CNT3,#00H
SJMP NX6
NX5: MOV CNT3,#01H

NX6: JNB BK4,NX7
  MOV CNT4,#00H
SJMP NX8
NX7: MOV CNT4,#01H

NX8: JNB BK5,NX9
  MOV CNT5,#00H
SJMP NXA

NX9: MOV CNT5,#01H

NXA: JNB BK6,NXB
  MOV CNT6,#00H
SJMP NXC
NXB: MOV CNT6,#01H

NXC: JNB BK7,NXD
  MOV CNT7,#00H
SJMP NXE
NXD: MOV CNT7,#01H

NXE: JNB BK8,NXF
  MOV CNT8,#00H
SJMP RCV
NXF: MOV CNT8,#01H

RCV: JNB RI,MAIN
  CLR RI
  MOV A,SBUF
  CJNE A,#'Q',MAIN
OUT:
  MOV A,CNT1
  ADD A,CNT2
  ADD A,CNT3
  ADD A,CNT4
  ADD A,CNT5
  ADD A,CNT6
  ADD A,CNT7
  ADD A,CNT8
  MOV CNT,A
  CJNE A,#00H,YY1
  LCALL ON0
  LCALL DDELAY
  LJMP MAIN
YY1: CJNE A,#01H,YY2
  LCALL ON1
  LCALL LOOKUP
  CLR VC1
  LCALL DELAY
  SETB VC1
  LCALL DDELAY
  LJMP MAIN
YY2: CJNE A,#02H,YY3
  LCALL ON2
  LCALL LOOKUP
  CLR VC2

```

```

LCALL DELAY
SETB VC2
LCALL DDELAY
LJMP MAIN
YY3: CJNE A,#03H,YY4
LCALL ON3
LCALL LOOKUP
CLR VC3
LCALL DELAY
SETB VC3
LCALL DDELAY
LJMP MAIN
YY4: CJNE A,#04H,YY5
LCALL ON4
LCALL LOOKUP
CLR VC4
LCALL DELAY
SETB VC4
LCALL DDELAY
LJMP MAIN
YY5: CJNE A,#05H,YY6
LCALL ON5
LCALL LOOKUP
CLR VC5
LCALL DELAY
SETB VC5
LCALL DDELAY
LJMP MAIN
YY6: CJNE A,#06H,YY7
LCALL ON6
LCALL LOOKUP
CLR VC6
LCALL DELAY
SETB VC6
LCALL DDELAY
LJMP MAIN
YY7: CJNE A,#07H,YY8
LCALL ON7
LCALL LOOKUP
CLR VC7
LCALL DELAY
SETB VC7
LCALL DDELAY
LJMP MAIN
YY8: CJNE A,#08H,YY9
LCALL ON8
LCALL LOOKUP

```

```

CLR VC8
LCALL DELAY
SETB VC8
LCALL DDELAY
YY9: LJMP MAIN

```

```

delay:
mov r0,#0ffh
lb0: mov r1,#0ffh
djjnz r1,$
djjnz r0,lb0
ret

```

```

ddelay:
mov r2,#90
laa1z: mov r3,#90
laa0z: mov r5,#90
djjnz r5,$
djjnz r3,laa0z
djjnz r2,laa1z
ret

```

```

sinit:
mov SCON,#50h
mov TMOD,#20h
mov TH1,#0FDH
setb TR1
ret

```

```

BTsend:
bak:
clr a
movc a,@a+dptr
jz label
acall trans
inc dptr
sjmp bak
label:
ret

```

```

trans: clr ti
mov sbuf,a
here1: jnb ti,here1
ret
LOOKUP:
MOV A,CNT1
CJNE A,#01H,NO1

```



```

mov dptr,#1B00h
lcall sinit
lcall BTsend
NO1:
MOV A,CNT2
CJNE A,#01H,NO3
mov dptr,#1B20h
lcall sinit
lcall BTsend
NO3:
MOV A,CNT3
CJNE A,#01H,NO4
mov dptr,#1B40h
lcall sinit
lcall BTsend
NO4:
MOV A,CNT4
CJNE A,#01H,NO5
mov dptr,#1B60h
lcall sinit
lcall BTsend
NO5:
MOV A,CNT5
CJNE A,#01H,NO6
mov dptr,#1B80h
lcall sinit
lcall BTsend
NO6:
MOV A,CNT6
CJNE A,#01H,NO7
mov dptr,#1BA0h
lcall sinit
lcall BTsend
NO7:
MOV A,CNT7
CJNE A,#01H,NO8
mov dptr,#1BC0h
lcall sinit
lcall BTsend
NO8:
MOV A,CNT8
CJNE A,#01H,NO9
mov dptr,#1BE0h
lcall sinit
lcall BTsend
NO9:
RET

```

```

ON1:
mov dptr,#1A00h
lcall sinit
lcall BTsend
RET

```

```

ON2:
mov dptr,#1A10h
lcall sinit
lcall BTsend
RET

```

```

ON3:
mov dptr,#1A20h
lcall sinit
lcall BTsend
RET

```

```

ON4:
mov dptr,#1A30h
lcall sinit
lcall BTsend
RET

```

```

ON5:
mov dptr,#1A40h
lcall sinit
lcall BTsend
RET

```

```

ON6:
mov dptr,#1A50h
lcall sinit
lcall BTsend
RET

```

```

ON7:
mov dptr,#1A60h
lcall sinit
lcall BTsend
RET

```

```

ON8:
mov dptr,#1A70h
lcall sinit
lcall BTsend

```

RET

ON0:

mov dptr,#1A80h

lcall sinit

lcall BTsend

RET

org 1A00h

db "NO.OF BOOKS:1",0DH,0AH,0

org 1A10h

db "NO.OF BOOKS:2",0DH,0AH,0

org 1A20h

db "NO.OF BOOKS:3",0DH,0AH,0

org 1A30h

db "NO.OF BOOKS:4",0DH,0AH,0

org 1A40h

db "NO.OF BOOKS:5",0DH,0AH,0

org 1A50h

db "NO.OF BOOKS:6",0DH,0AH,0

org 1A60h

db "NO.OF BOOKS:7",0DH,0AH,0

org 1A70h

db "NO.OF BOOKS:8",0DH,0AH,0

org 1A80h

db "NO.OF BOOKS:0",0DH,0AH,0

org 1B00h

db "SLOT 1:EMEBDEDDED

SYSTEMS",0DH,0AH,0

org 1B20h

db "SLOT

2:SIGNALS&SYSTEMS",0DH,0AH,0

org 1B40h

db "SLOT 3:PYTHON",0DH,0AH,0

org 1B60h

db "SLOT 4:VLSI",0DH,0AH,0

org 1B80h

db "SLOT 5:DSD",0DH,0AH,0

org 1BA0h

db "SLOT 6:SOC",0DH,0AH,0

org 1BC0h

db "SLOT 7:ECA",0DH,0AH,0

org 1BE0h

db "SLOT 8:MPMC",0DH,0AH,0

END

7 CONCLUSION:

The project work “**LIBRARY MANAGEMENT SYSTEM**” is aimed to gives us the complete information about the number of books in library. We can enter the record of new books and retrieve the details of books available in the library. The project “Library Management System” is developed on embedded system .The main advantage of using this technology is that the system announce the number of books through the speaker. This project work is taken up and a prototype module is constructed for the live demonstration.The demo module is considered for one book shelf & it is having eight slots. For real applications, big shelf’s can be constructed with huge number of compartments; there by lot of books can be stored. While designing and developing this proto type module, especially while fabricating the parts, we have consulted few experts those who are having knowledge. Electrical & electronic components are easily available. Since it is a prototype module, much amount is not invested, the whole demo module is constructed with locally available components, lot of modifications must be carried out in design & is essential to make it as real working system. Hence, the system is to be enhanced further for obtaining better results. Although a good amount of work has been done in the project work, even though additional features like what subject of book is there in the specific shelf etc. Must be incorporated in the real working system. In this regard there is

still scope of further improvement in the control structure by providing more flexible control.