

Michigan State University
Department of Computer and Electrical Engineering

ECE 480: Application Note
Voice Recording and Playback Devices
using ISD1420P Chip

Name: Jeli Joegiono
PID: A35423846
Team Number: 1
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Executive Summary

This paper is to demonstrate the instructions on how to wire and program the audio chip ISD 1420P. The first section of this paper will help the reader to have a better understanding about how the audio device works. The following section is the explanation in details about the wiring and also the program of the audio feedback.

Keywords: Oscillator, Internal Clock

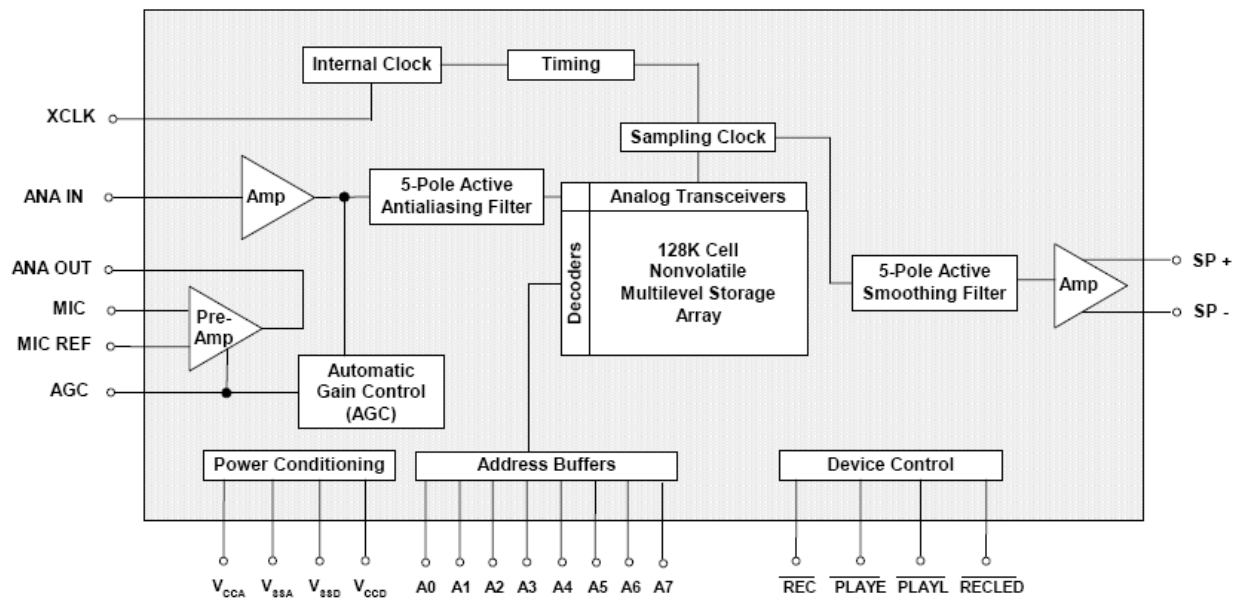
Introduction

An audio feedback device is feedback that occurs when a sound loop exists between an audio input (for example microphone) and audio output (for example loudspeaker). The signal received by the microphone is amplified and passed out to the loudspeaker. By amplifying further, the sound from the loudspeaker can then be received again and then passed out through the loudspeaker once again.

For our current project, we will be using an IC chip called ISD1420P ChipCorder. It provides high quality, single chip, record and playback solution for the short duration messaging application. This chip has a memory up to 20 seconds of recording. The minimum record/playback subsystem can be configured with a speaker, or a microphone.

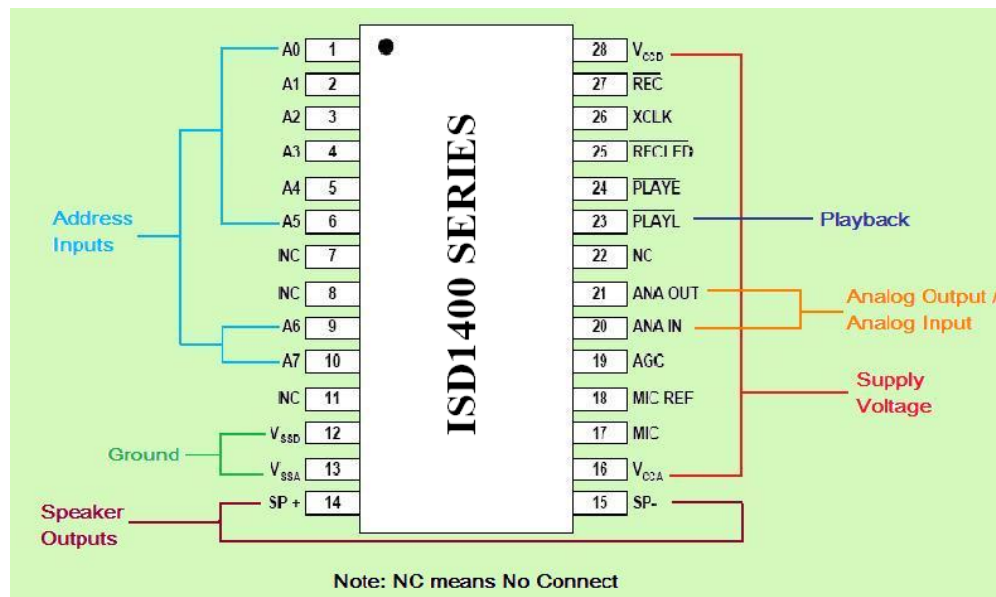
Recording are stored into on-chip memory cells that provides zero – power message storage that will eliminates the battery backup circuits. In addition, the voice and audio signals are stored directly into the memory that provides a high quality, solid state voice reproduction. This chip is fully addressable to handle multiple messages and has on – chip oscillator. It has 100,000 typical record cycles and has sampling frequencies of 6.4 and 8.0 KHz.

The following is the block diagram for the ISD1420 ChipCorder.



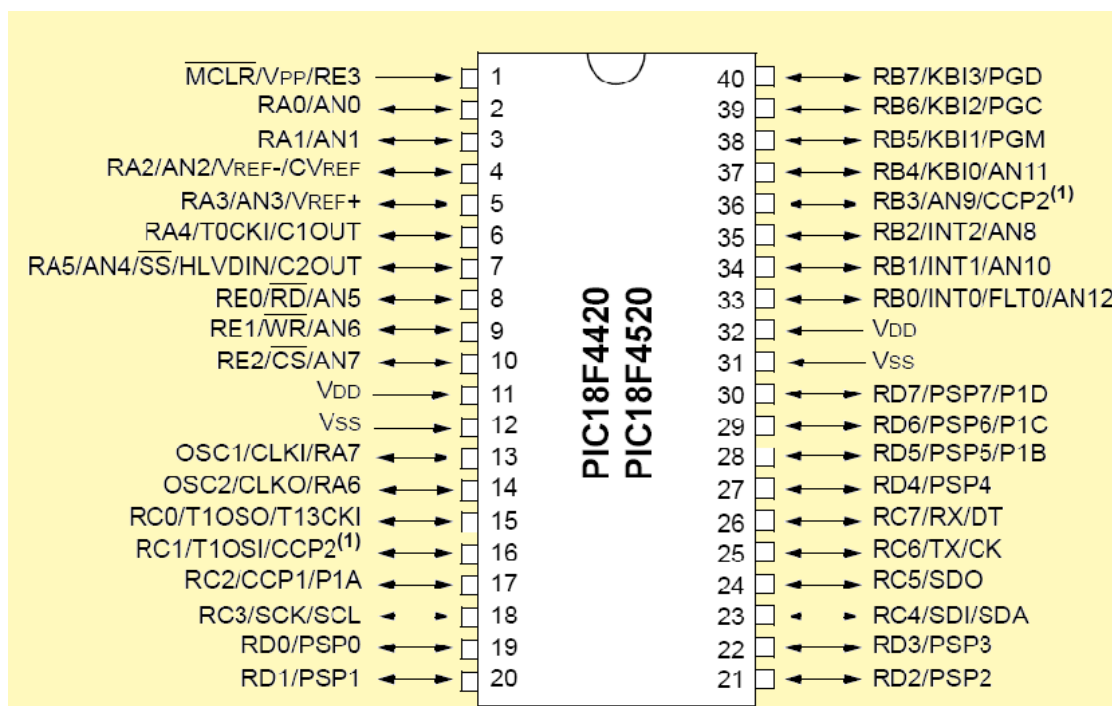
As we can see from the diagram above, this ISD chip has its own internal clock. This chip has 28 pins configuration and has its own internal clock. The input address for the ISD chip is from A0 – A7. We will be using PLAYL instead of PLAYE because the audio device will only play the message after the user push the play button.

The pin configuration is shown below in details:



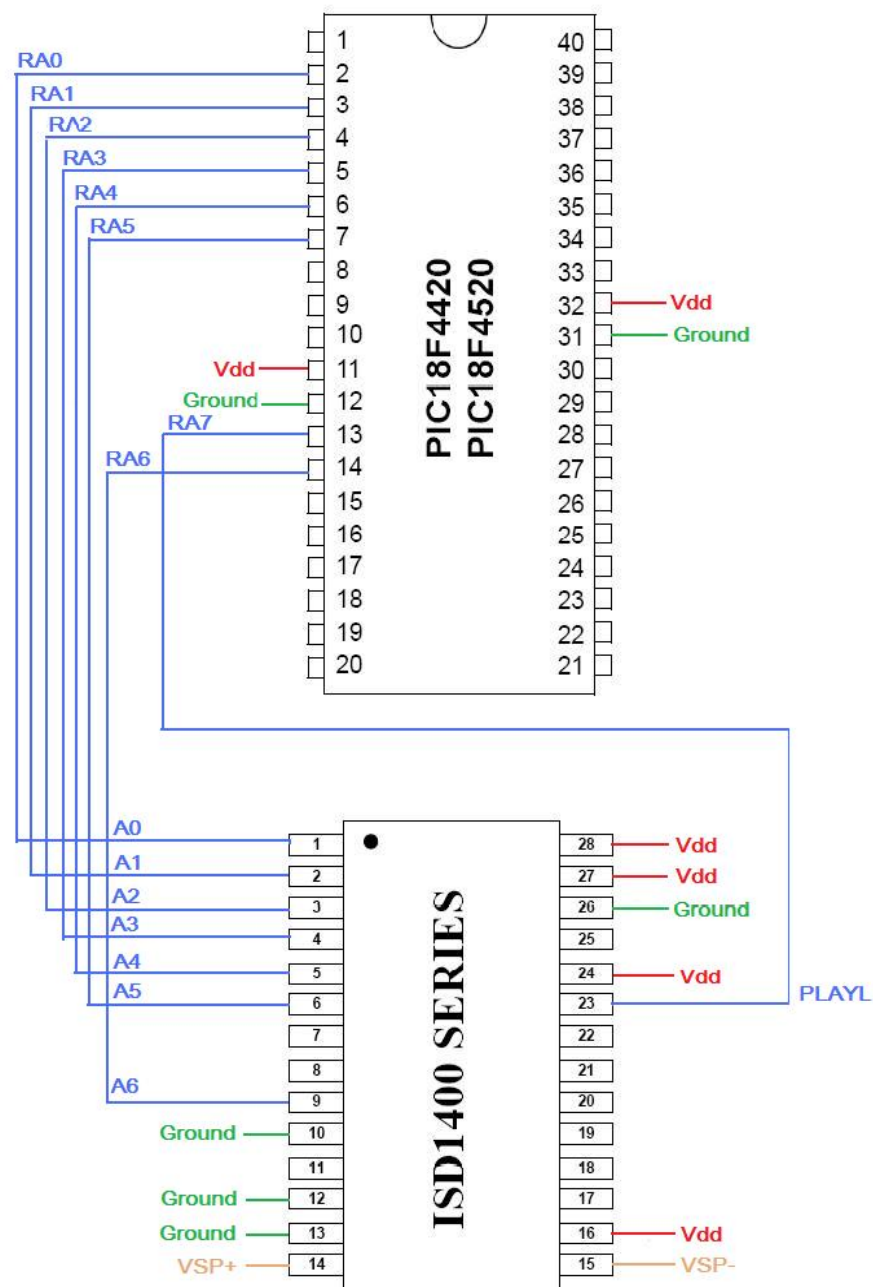
For the wiring, we will be using the peak of microcontroller model PIC18F4520 that has 40 pins. This microcontroller has five ports (PORTA, PORTB, PORTC, PORTD, and PORTE).

Following is the 40 pins configuration in the microcontroller PIC18F4520.



We will be using PORTA for the microcontroller to wire it with the address inputs in the audio device. Therefore, we will be using pin 2, pin 3, pin 4, pin 5, pin 6, pin 7, pin 13, and pin 14. Once the wiring is done, we will connect it to the microchip to run the program/code.

The wiring diagram for both microcontroller and ChipCorder is shown below in details:



The code for the microchip in order to operate the audio device is as follow:

```
#include <p18cxxx.h>
#include <timers.h>
#pragma config WDT = OFF
#pragma config OSC = INTIO67 ; internal clock
long int count;
void main ( )
{
    TRISA = 0x00; set all the pins of port A to outputs
    PORTA.bits.RD7 = 1; set the pin 7 of Port A to high
    for (count = 1; count < 2000; count++);
    PORTA = 0x00;
    for (count = 1; count < 2000; count++);
    while (1)
    {
        PORTA = 0x32; address for each inputs data
        PORTA.bits.RD7 = 0; set the signal to low to play the message
        for (count = 1; count < 2000; count++);
        PORTA.bits.RD7 = 1; set the signal to high to stop playing message
    }
}
```

Conclusion

In this paper, I have explained how to wire and program the audio Chipcorder. This is very important because it is a basic knowledge about wiring and also programming. Most of the electronic devices required wiring and write a basic/simple code in order to operate the devices. This might seems a little bit complicated for students who do not have a background in writing a program. Visual Basic, LabView, C++ are also another tool that students can use to write a program/code.

References

http://www.datasheetcatalog.com/datasheets_pdf/I/S/D/1/ISD1420.shtml

<http://www.datasheetcatalog.org/datasheet2/f/0xwypjaz882icwuhol9cl7exy37y.pdf>