Microprocessor Systems

Project Proposal

Group no.: 5

Team members:
1. Abdelrahman Nasr Elshennawi.
2. Ayman Mohamed Abo El maaty.
3. Mahmoud Ahmed Ismael.
4. Tarek Mohamed Abdel Hakim

Project Idea:

Our project is about building a standalone Kit that doesn't interface with any other device to perform its primary function, that is Reading a MP3 song from an SD Memory card and decode it to Analog signal to send it to the speakers, interfaced with the user using a keyboard matrix, using ATMEL AT90S8515 Microcontroller programmed with assembly using AVR tools 4.

Project details:

I. Required Components:

In our project we will be using

1. AT90S8515 Microcontroller to control the circuit & perform the decoding process.
2. Memory Slot that will connect the SD Memory Card with the kit.
3. SD Memory card that will store the req. songs.
4. A 5V Power supply for the Kit.
5. DAC device to convert the microcontroller output to signal.
6. An Electronic circuit for filtering & amplifying the output signal.
7. A LCD Screen to show the data to the user.
8. A 3x3 Keyboard Matrix to interface with the user.
9. A headphone connector to connect the speakers with the Kit.
10. An ON\OFF switch to close the device.

II. Project Description:

The sequence of the operation requires that when the user switch the Kit on the ATMEL microcontroller starts working by sending a control signal to the SD card and check if the card is found or not, if it's found the Microcontroller request the first song details (name, time,…..) and show its information on the LCD screen then wait for the user's input.

The user could start the song or load the next\previous song; if he pressed the start button on the Keyboard matrix, the microcontroller will start sending a control signal to read the MP3 frame from the SD Memory, then decode it, then the DAC device convert it to signal, then send it to the filtering circuit to filter & amplify the signal, and then to the speakers and loop the last sequence of operations until the end of the file.

During the process the user can press stop the song, pauses the song or next\previous song; stopping the song will return the address pointer to the beginning of the song, while pausing the song will enter an infinite loop until the user press play again.

Next\Previous button send to the SD Memory card a control signal to get the next\previous file address to prepare it for playing and write its information on the screen.

III. System Diagram: