Versatile Lightning Cable with In-Built Jack Assembly

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Abstract— The goal of this paper is to build up an assembly for accessing input signals which is coming from two different ports at the same time in only one connector. This relates to working of a lightning cable with audio jack by using lightning cable power assembly for producing output from the jack without using extra adaptors. With the current Generation smartphones, the audio jack is removed, due to that lighting to audio jack adaptor is required hence earphones can't be used while charging your phone without specific adaptors. With this sort of cable design, single lightning port will further evolve into both audio jack and/or lightning out. So users can use more accessories at the same time despite having a single port. The goal of this paper is two offering two ports in connector by using energy harvesting for both of this port. Here usb port will further use as access port for pen-drive access.

Key words: Lightning Connector, 3.5mm Audio Jack, USB Port, Mobile Assembly, Arm Cortex A7 H3 Processor Development Board

I. INTRODUCTION

Since major smartphone companies were provided two separate ports, one is for charging and the other is for audio jack for listening to music. But in current scenario major smart phone companies are removing audio jack in their flagship phones and giving only one type of port for charging. And providing wireless ear pods for audio signals. Since this ear pods are rechargeable and their working is based on frequent charging of them and use them, which is somehow very bothersome and it takes time.

The goal of using two ports in one cable can be obtain by gathering ports and building up a Connector for surveying them for multi functionality purposes.

II. BACKGROUND

A lightning cable currently invariably used commonly for earphone, charging etc., and at a time only one cable can be connected in one and only available port.We have to switch the cable frequently which is very tedious. To avoid frequent re-connection of cables like earphone cable and charging cable a new invention in the form of combination of lightning connector with in-built audio jack and lighting out is being designed.here we add some functionality to usb port by accessing pen-drive through that port.

III. PROPOSED TECHNIQUE

Proposed technique consist of arm cortex A7 H3 processor development board with Debian os for synchronization of signals which arrived from USB IN port and audio jack assembly and operate them at the same time. Here major block consists audio synthesizer unit, audio amplifier and Power Supply unit. Charging circuit consist of power section of 5v, 1.2 A is used for entire processing of signals with combine signal of audio jack. Here voltage protection circuit is used to prevent an overvoltage condition of a power supply unit from damaging the circuits. Audio jack is provided which is used for analog signals operation. Here usb port is further utilize as pen-drive access port which is configure with the help of Linux shell scripting for accessing the signals.

The final output from audio jack and charging circuit and from arm cortex A7 H3 processor development board is given at the final stage at mobile phone (Iphone) and verified and tested. and so we get two different signals at the same time and further we get the access of data from internal memory of arm cortex A7 H3 processor development board through USB port .

IV. BLOCK DIAGRAM

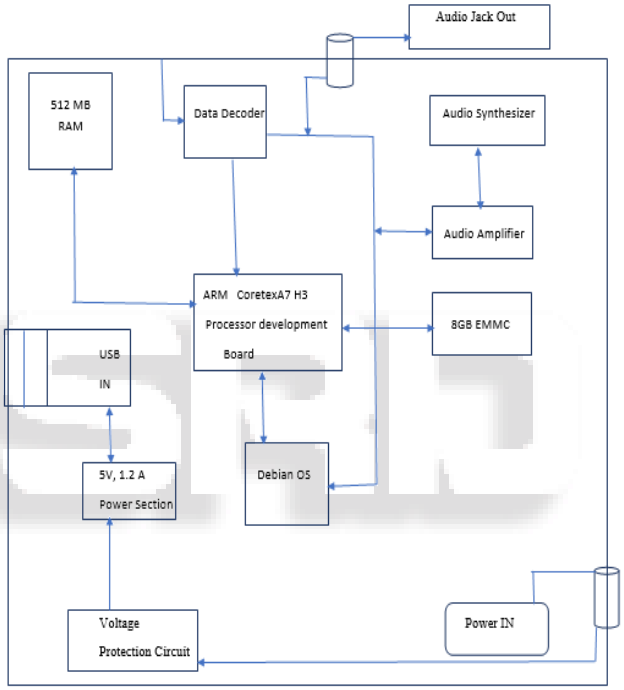

Fig.1: Functional Block Diagram of Connector

Here audio synthesizer and voltage protection circuit is important blocks for accessing two signals at the same time.

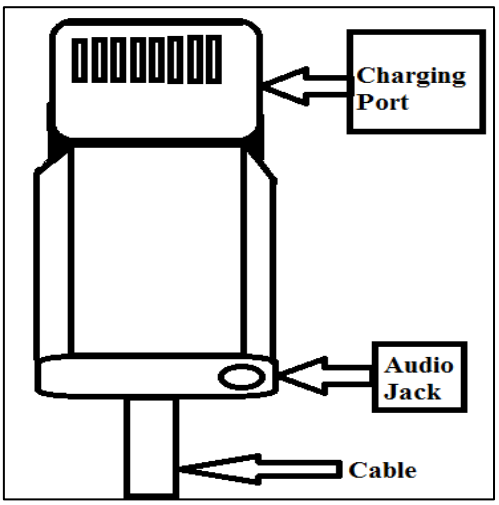

Fig. 2: Schematic of Proposed connector

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V. OBSERVATION

Here from the simulations individual output of the charging port and of the audio port is tested in order to provide audio and charging at the same time. By using development board same power harvesting can be used for both of the ports. here usb port is utilized for pen-drive access as well as internal data access from the arm cortex A7 H3 processor development board.

VI. SIMULATION RESULTS

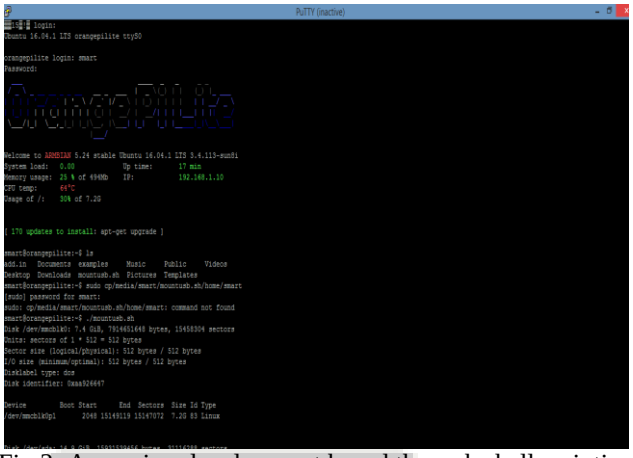

Fig.3: Accessing development board through shell scripting

Fig.4: Accessing Playlist through shell scripting

Here interfacing of mobile phone (Iphone) and audio jack is verified with the use of shell scripting.

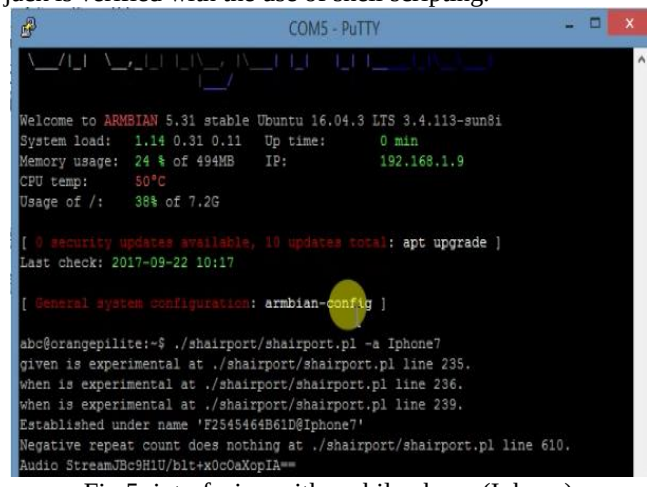

Fig.5: interfacing with mobile phone (Iphone)

VII. CONCLUSION

Communication between arm cortex A7 H3 processor development board and mobile phone(Iphone) is successfully established with proposed system with the help of shell scripting in Linux. interfacing of mobile phone (Iphone) and audio jack has been Successfully implemented in Linux on arm cortex A7 H3 processor development board. hence, by this work we can use earphone while phone is charging. further usb port is utilize as access port for pen-drive.so we access pen-drive data signals of audio file through arm cortex A7 H3 processor development board by shell scripting commands.

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