Time-shift radio

For satellite receiver it is a matter of course to have a time-shift function in order to stop or rewind the current TV- program because you have not understood the speaker of the news or something else.
But the same thing can also happen by listening the news or traffic information at your radio receiver.
Unfortunately there is no radio receiver available having such a time-shift function. And that was one of the reason for building this time-shift radio project based on mbed.

Beside the mbed LPC1768 the heart of this project is the TLV320 stereo audio codec supported by the TLV320 mbed library. At this point let me say thank you to Ioannis Kedros and Daniel Worral, the authors of the TLV320 library, because without this library this project would not be possible for me. The other used mbed libraries mainly supports the control of the FM-receiver like frequency dialling or station store and selection. Control of the FM-receiver will be done by a scrolling LCD menu and an RPG dialler. This could be implemented in a much better way. But for this project it has only a minor priority.
The time-shift function consist out of stop, continue, rewind, and switching to the live radio program. The main function is:

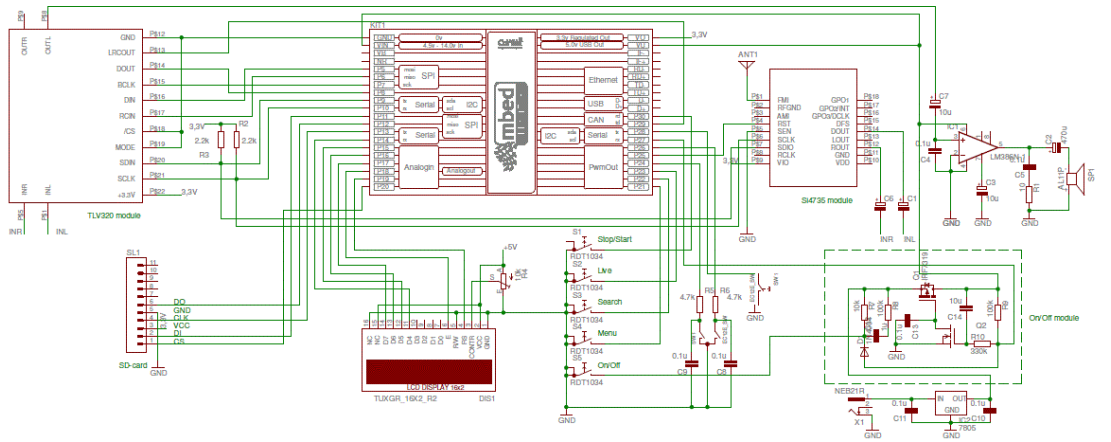
- store the current radio program onto the SD-card
- read the stored audio data back
- put it to the audio amplifier(via TLV320)

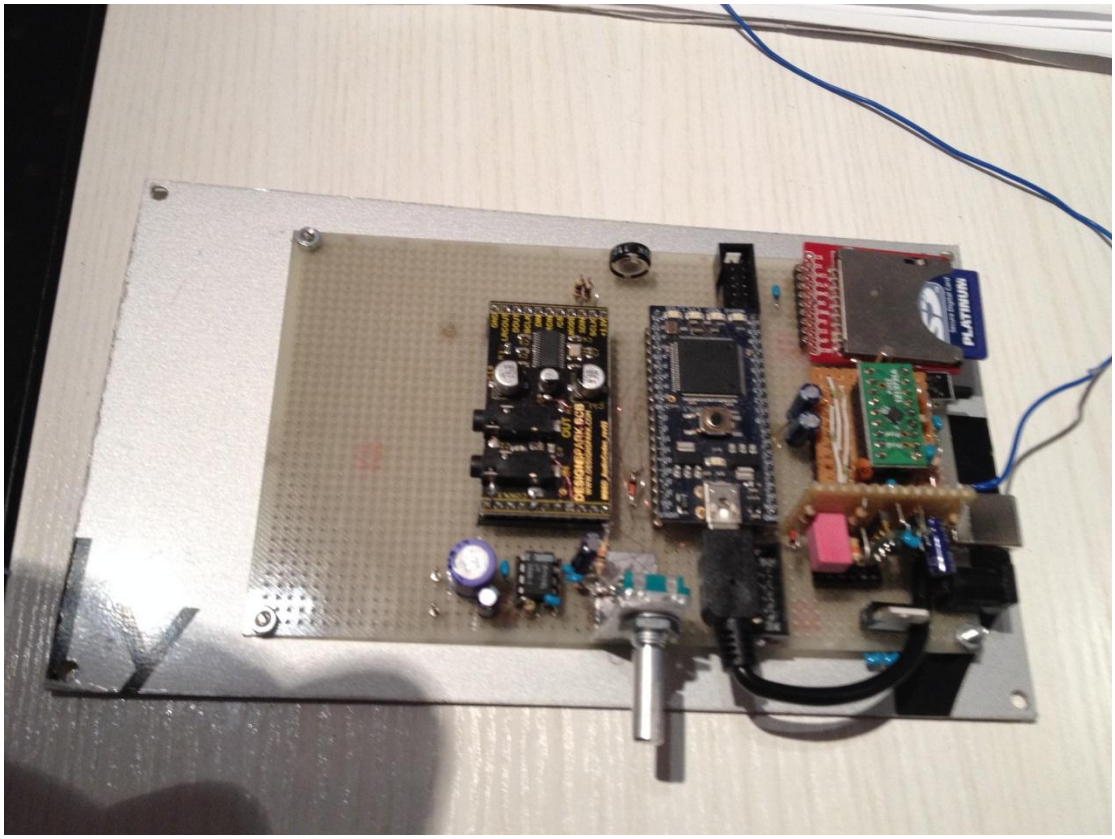
What will be read back from the SD-card depends on the internal read pointer which will be stopped when the stop key is pressed while writing to the SD-card continues, controlled by the write pointer. When the radio program is stopped, it may be rewound by the RPG, which causes decrementing the read pointer. Pressing the stop key again will continue the audio transmission from the actual read pointer. Pressing the live button causes setting the read pointer equal to the write pointer and the actual radio program will be received. By the way: it is an “almost live” button. Due to writing to and reading from the SD-card the actual radio program is delayed about a second.
That’s in short words the function of the software. Details may be taken out of the code.

The hardware consist out of 6 different modules:

- mbed LPC1768 board
- TLV320 audio CODEC
- Si4735 AM/FM radio receiver
- 16x2 LCD Display
- Push-button On/Off module
- SD-card

Everything is assembled around the LPC1768 board on a bare PCB connected by thin cupper wire. All I/O ports of the LPC1768 are in use.
The schematic is shown below:






90.30 (55,18)
TS-Radio
Stop/Start
Live
Search
Menu
On/Off