DSEQ32 (aka yet another TR clone) is based on the classic TR drumsequencers

see trsequencer for more drumsequencer designs



Features

- 32 step 8 track drum seq, each step has trig/acc/roll
- one track can be used as note track for bass sequencing
- independant length/tempo divisor for each track, all can be synced to a master track
- 8 banks of 16 patterns
- patterns are saved on a bankstick
- song mode (not sure how I will implement this..)
- all functions can be executed while running
- forward/backward playing direction
- 24 PPQ resolution
- midi clock master/slave (maybe also taptempo)
- settings are stored on internal eeprom

note that these features are not final!

Interface

- lcd: displaying (bpm pat trknr edited_par)
- 32 step buttons + stepleds, leds are dual color to display trig/acc
  - step edit behaviour: step off/trig/trig+acc
  - all functions are accessed with a stepkey + shift combination
  - pattern selection: stepkey + pattern button

    - track select/mute: stepkey + track button
- rotary encoder for bpm, also used for editing values
- Step button layout:
    - Track layer

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select
Trk1	Trk2	Trk3	Trk4	Trk5	Trk6	Trk7	Trk8	Trk9	Trk10	Trk11	Trk12	Trk13	Trk14	Trk15	Trk16

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute
Trk1	Trk2	Trk3	Trk4	Trk5	Trk6	Trk7	Trk8	Trk9	Trk10	Trk11	Trk12	Trk13	Trk14	Trk15	Trk16

- Pattern layer

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select
Bank A	Bank B	Bank C	Bank D	Bank E	Bank F	Bank G	Bank 8								
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select	Select
Pat 1	Pat 2	Pat 3	Pat 4	Pat 5	Pat 6	Pat 7	Pat 8	Pat 9	Pat 10	Pat 11	Pat 12	Pat 13	Pat 14	Pat 15	Pat 16

- Function layer

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cut	Copy	Paste	Delete	NoteNr	Length	Divisor	Normal	Accent	Cut	Copy	Paste	Delete	Format	Midi	Fwd/Backwd
Track	Track	Track	Track	Track	Track	Track	Velocity	Velocity	Pattern	Pattern	Pattern	Pattern	Bankstick	Mode	Playdir

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Fill	Shift	MidiCh	MidiCh	MidiCh	Offset	Notelen								LCD	Reset
Track	Track	Drum	NoteSeq	CC	CC	NoteTrk								Mode	Seq

Progress

- first prototype
- new layout design
- ledmatrix/buttonmatrix finished (see matrix page)
- frontpanel finished/wired
- first take on controll surface handler (step, track and pattern handling)
- sequencer works, timing is not stable yet
- made a temporary case
- fixed flickering leds when pushing a button
- bankstick error handling added
- default pattern is loaded when no BS is available at startup
- independant length/divider for each track implemented
- LCD optimalisations
- loading and saving of patterns works now
- backward playing direction implemented
- midi mode implemented with simple slave mode (no interpolation)

- improved bpm handling (pattern bpm is saved with pattern)
- fill function implemented
- CS interface improved (the edit functions are now accessed with stepbutton+shift)
- settings are saved in internal eeprom
- notetrack implemented, this track will be used to program basslines
- changed data structure, new pattern is 256bytes
- cs is updated for notetrack (shift + track selects notetrack)
- shift + stop resets the song position
- due to code/ram space limitations the project is ported to a pic18f4620
- the core board was modified so that the backlight can be controlled by the software
- new bankstick routines to handle the larger pattern size
- 2 new functions added: Seq Reset and Backlight mode
- CC layer added
- tracks don't go out of sync after changing divisor
- the note track now has a note length parameter
- pattern banks are implemented
- new function: shift track
- the note-on status of tracks is displayed in the track layer
- note-off handling when seq is stopped added
- the pattern bpm is now loaded when the seq is not running

Software

most of the software will be written in C, some of the critical parts will be optimised in ASM to increase performance

the software will be based on the midibox clockbox example [uCApps]

- Data structure
- Application code
  - Bankstick code (updated)
  - Control surface code
  - Sequencer core code
  - Sequencer get/set and helper rountines
  - control surface code

Hardware

Components:

- CORE module CORE Module [uCApps]
- DOUTX3 DOUT Module [uCApps]
- DINX1 DIN Module [uCApps]
- BANKSTICK BANKSTICK Module [uCApps]

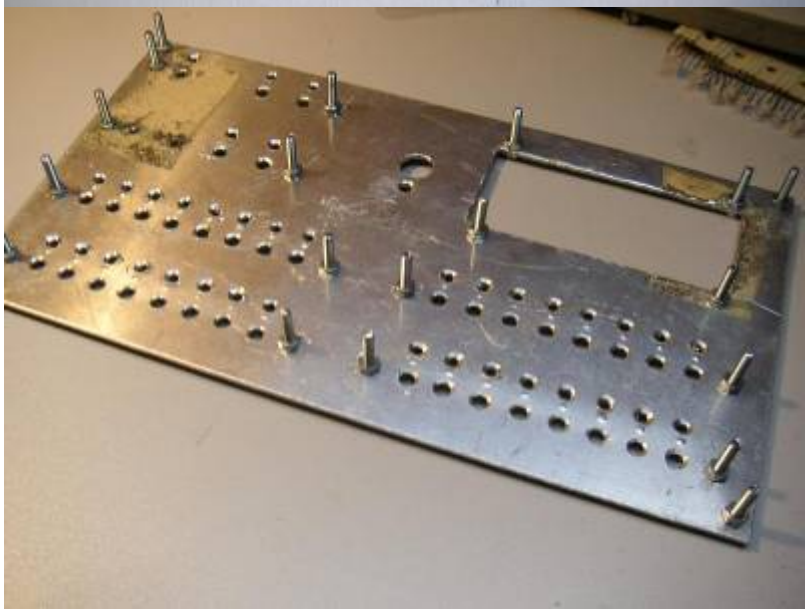
The leds/buttons are wired in a matrix configuration to reduce the number of DIN/DOUT modules

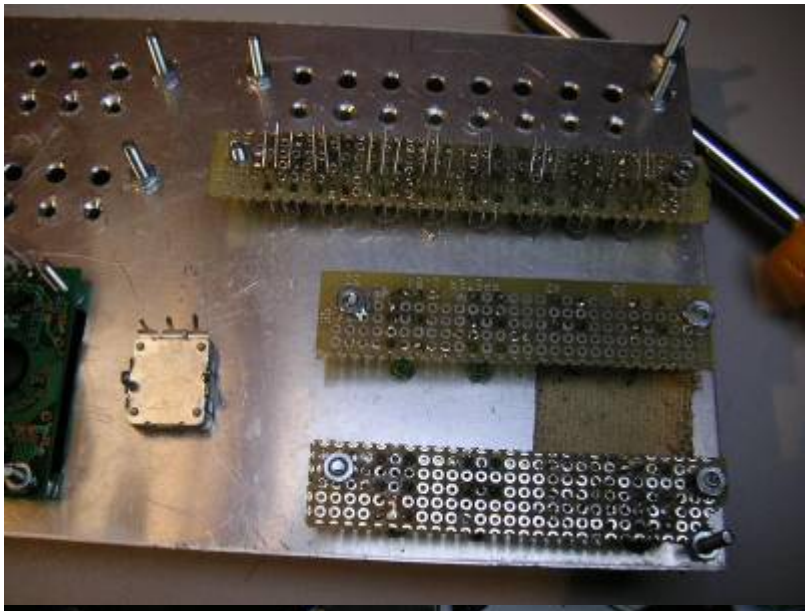
needed DSEQ32_matrix

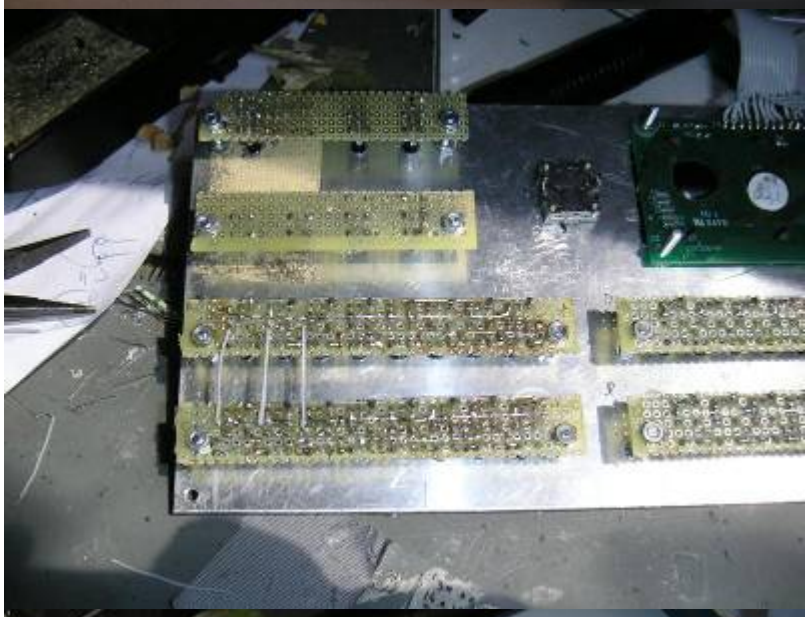
Construction

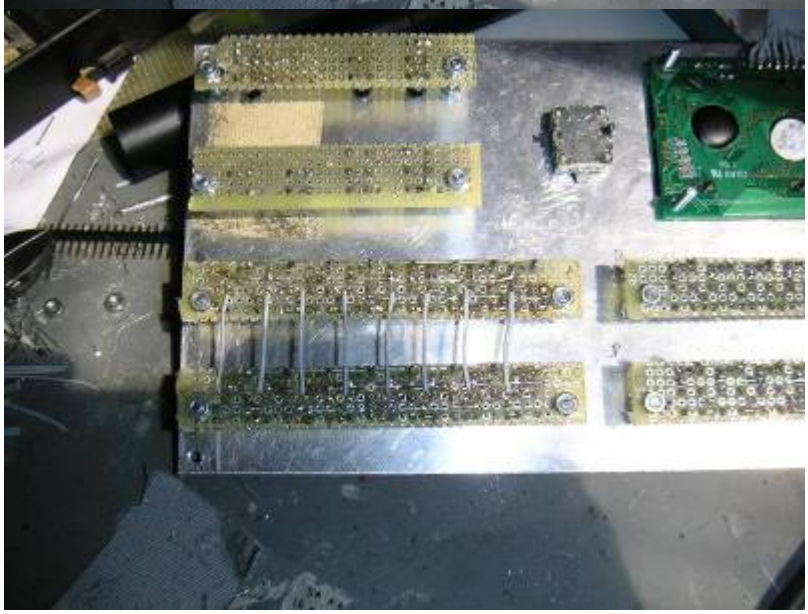
- Assembly of frontpanel

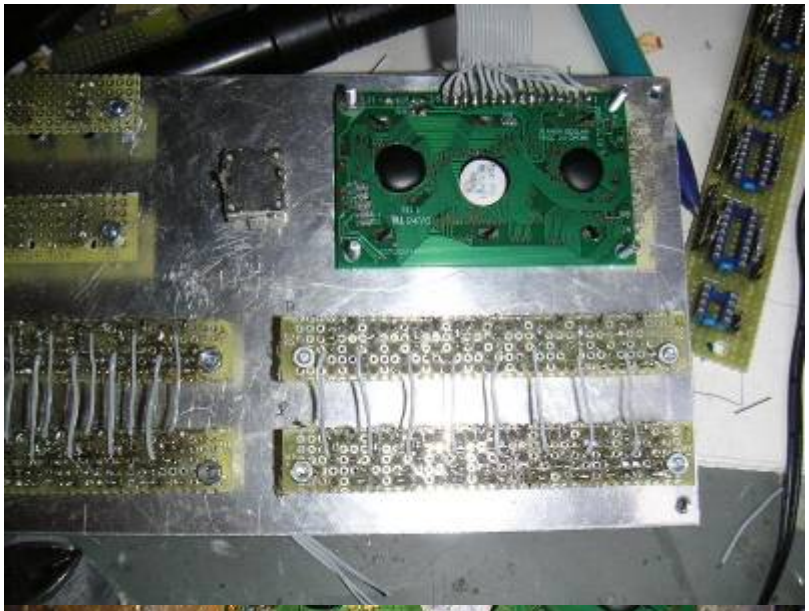


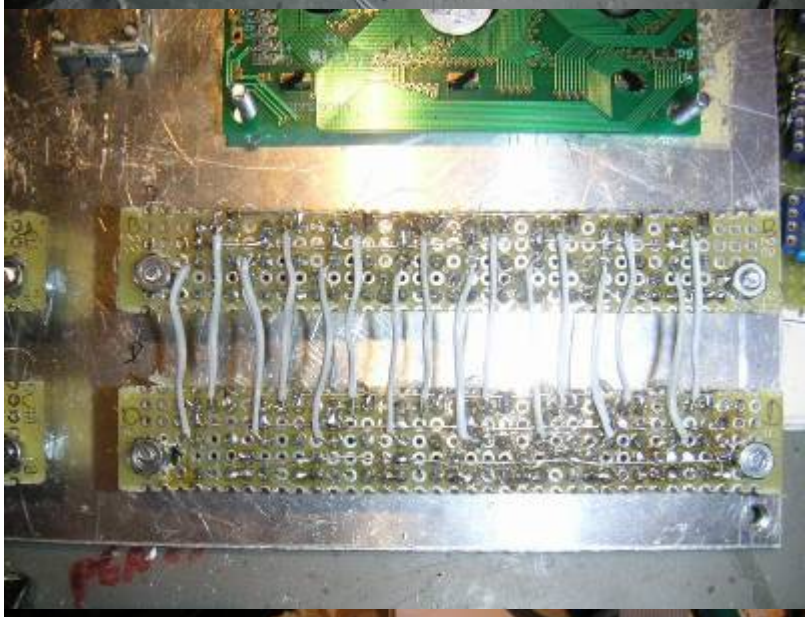


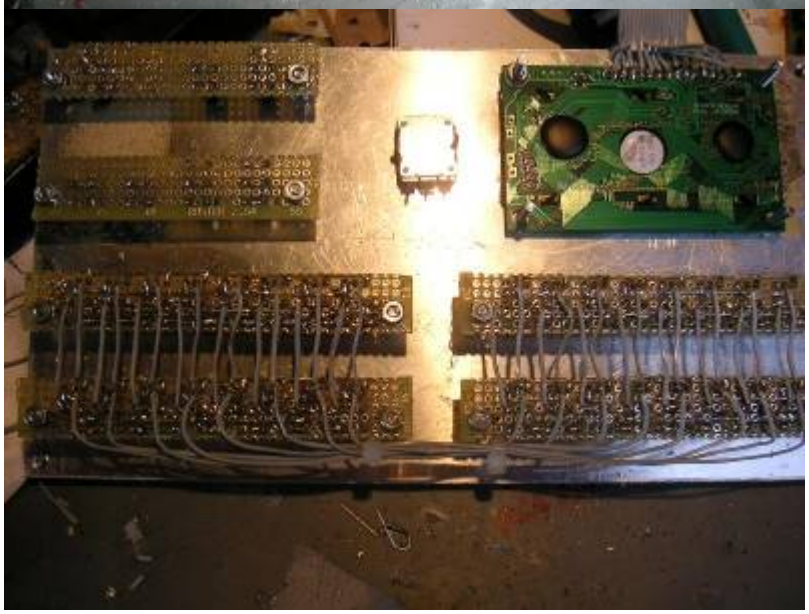


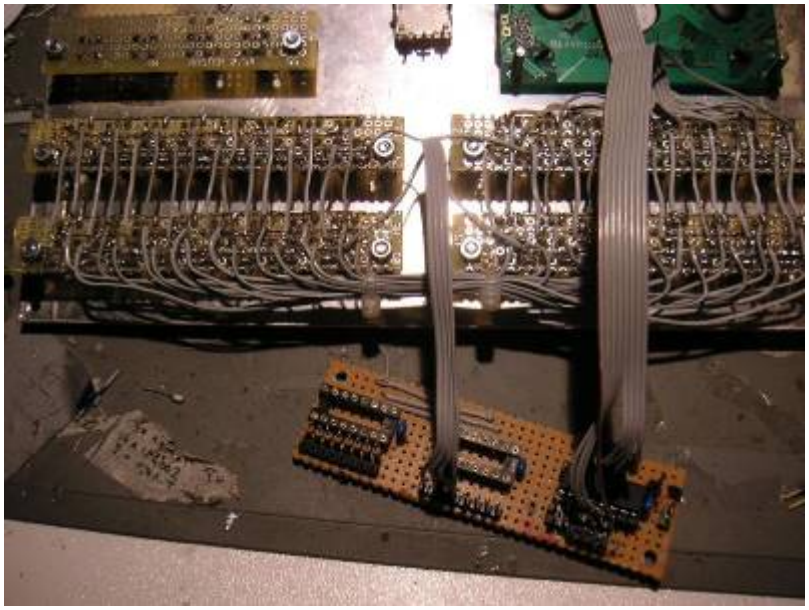




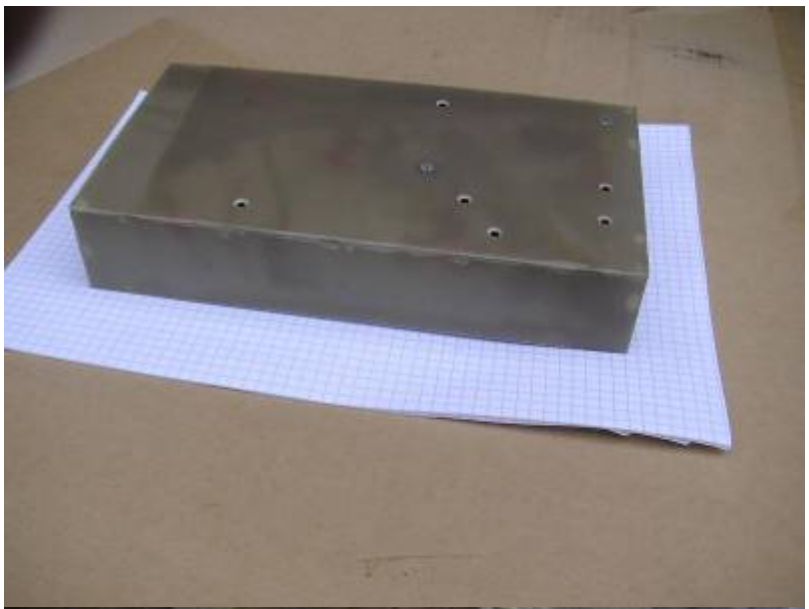


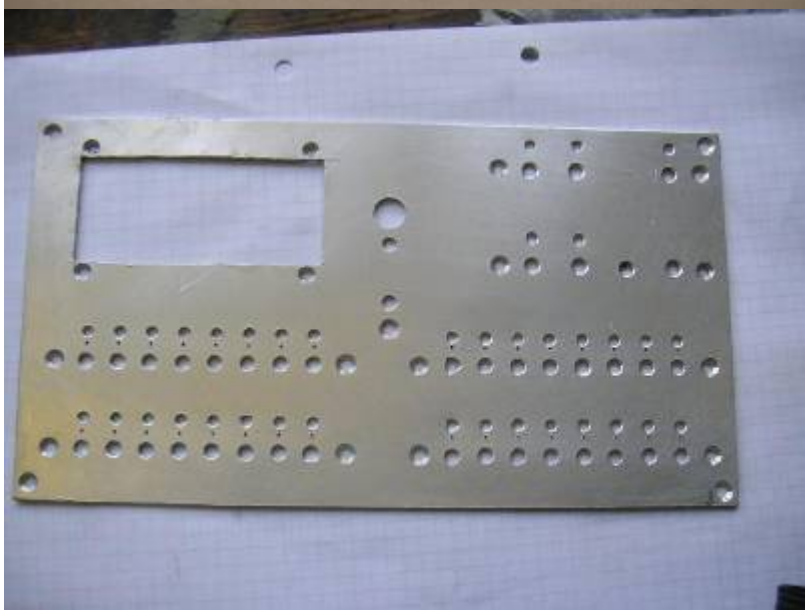


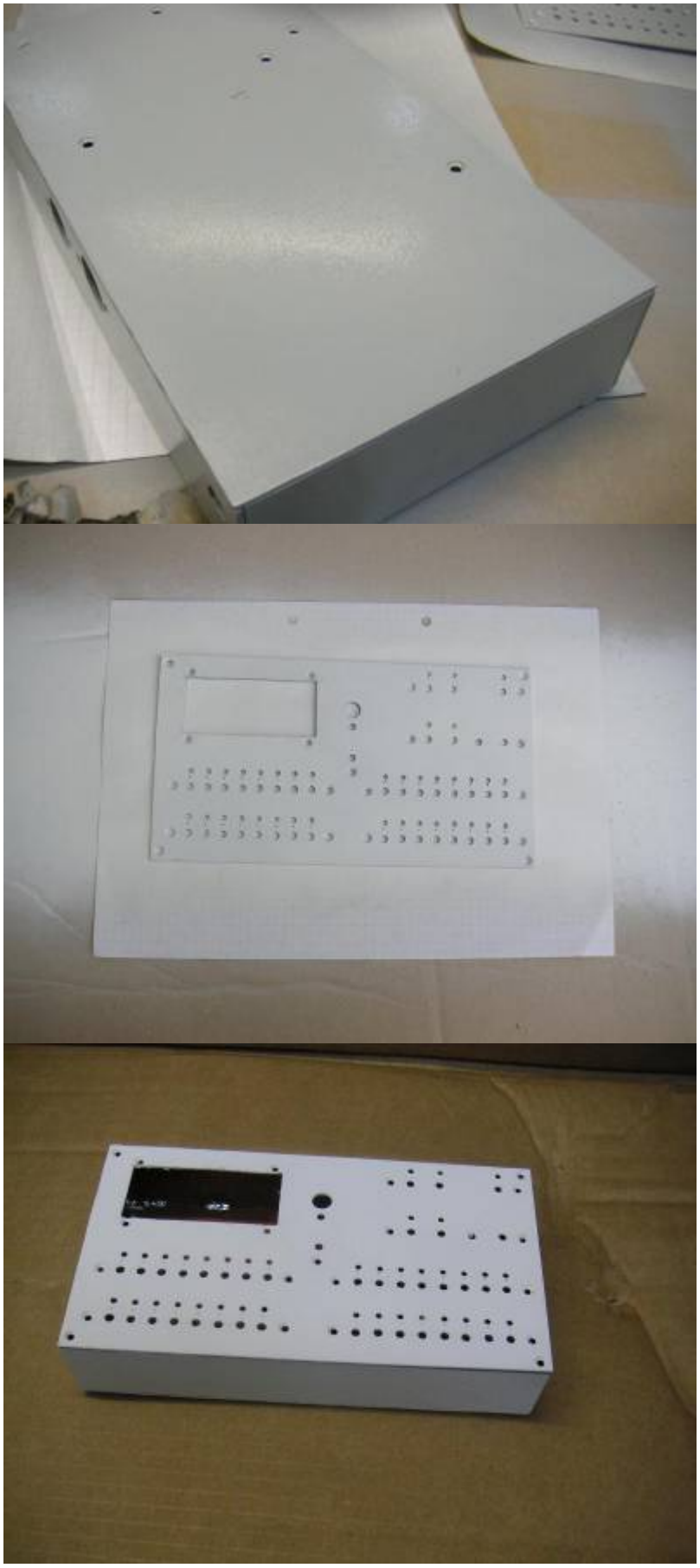




- Painting the case





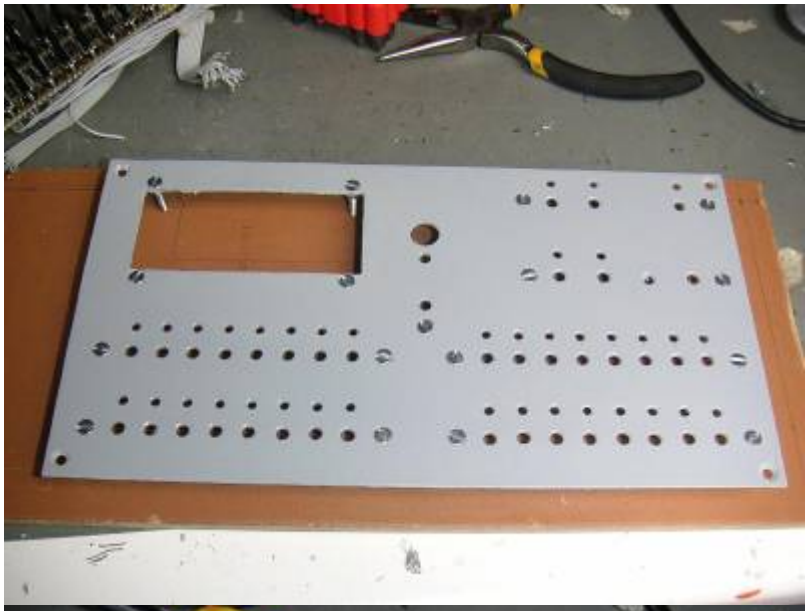


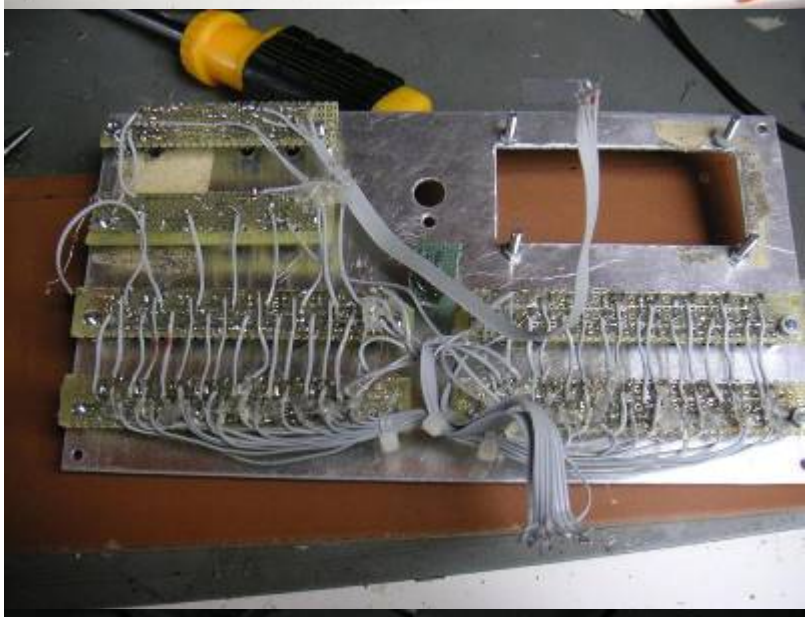
- Assembly after painting

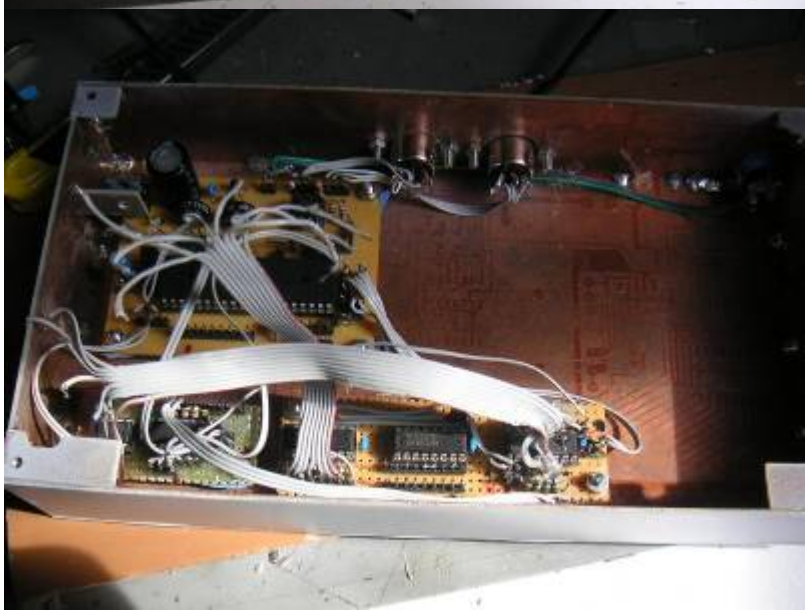














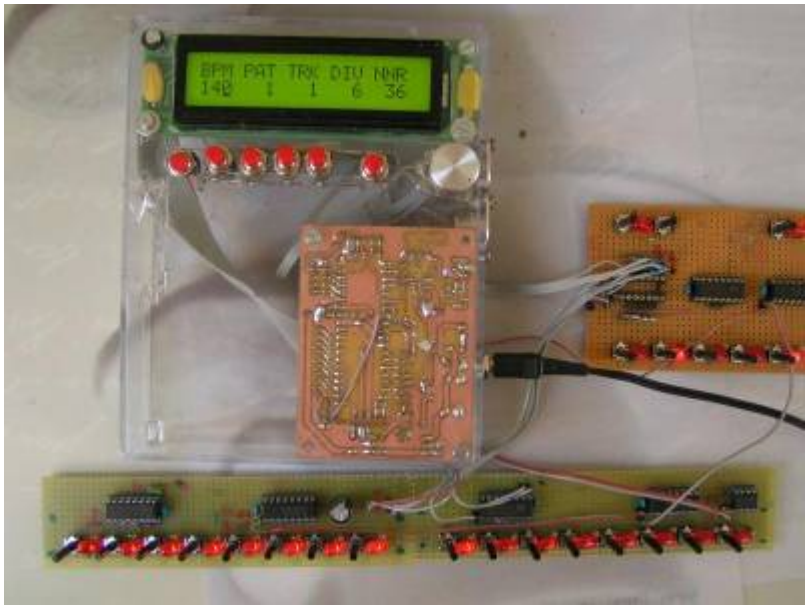
- Finished hardware



Development

First prototype:

forum topic



used for development of data structure, bankstick code, sequencer core

New version:

- Construction of frontpanel
- Wiring of the 32 step leds/buttons
- Testing of the step buttons with the SM_example application
- Testing of the step leds with modified SM_example app (modified version includes leddriver)
- Development of user interface code
- Button and led handling finished
- The flickering led problem is solved with MIOS v 1.9c
- Encoder handling works, but there's still a small bug
- Updated LCD layout for new functions
- The leds to indicate play/save/vel/special function button work now
- Some LCD optimalisations

- Development of seq code
- Sequencer edit functions work as expected
- Sequencer runs!
- Fixed sequencer mute track bug
- Some tracks didn't send the note off messages correctly, corrected
- Bankstick error handling added
- Default pattern is loaded when no BS is available at startup
- Note length/divider is implemented
- Independant length/divider for each track

back to user_projects

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