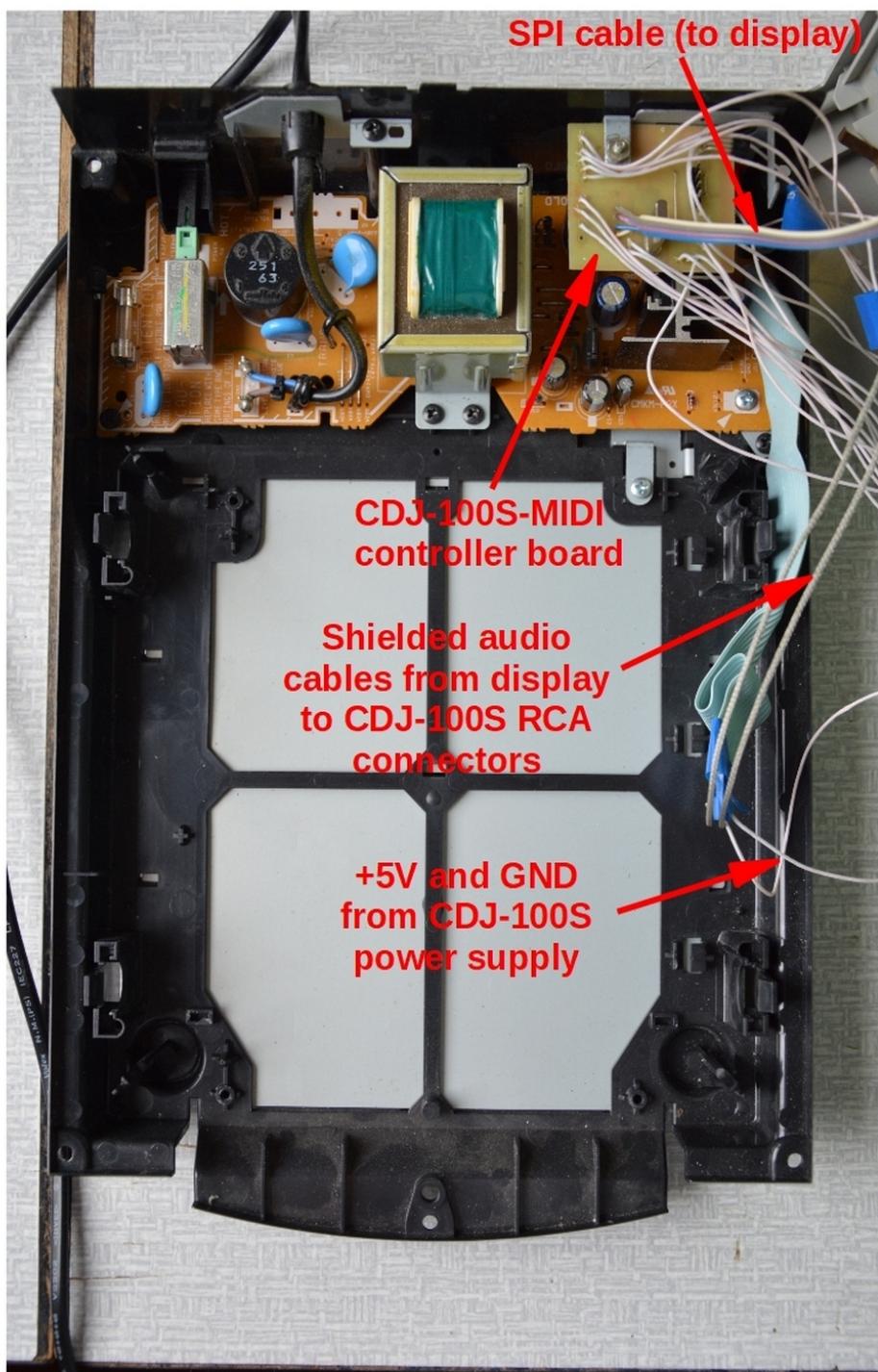


Device design

This section describes briefly how to upgrade your CDJ-100S player.

The system contains CDJ-100S player with removed CD drive and main board, custom MIDI controller board, and STM32F746G-Disco board.

In the CDJ-100S, the power supply (Trans) board and Display board are used. Custom board contains STM32F103C8 microcontroller, which is used to scan Display board buttons, pitch slider, etc., and send commands to STM32F746G-Disco board via SPI and MIDI commands via USB. STM32F746G-Disco board is connected via SPI to the custom board. STM32F746G-Disco board does the main work. It reads audio data from SD card, play them back via embedded WM8994 audio codec, displays information on the embedded touchscreen display, reads commands of playback control from the custom MIDI controller board.



First, you must assembly CDJ-100S MIDI controller.

Disassembly CDJ-100S. Remove CD drive and Main board – they will not be used further.

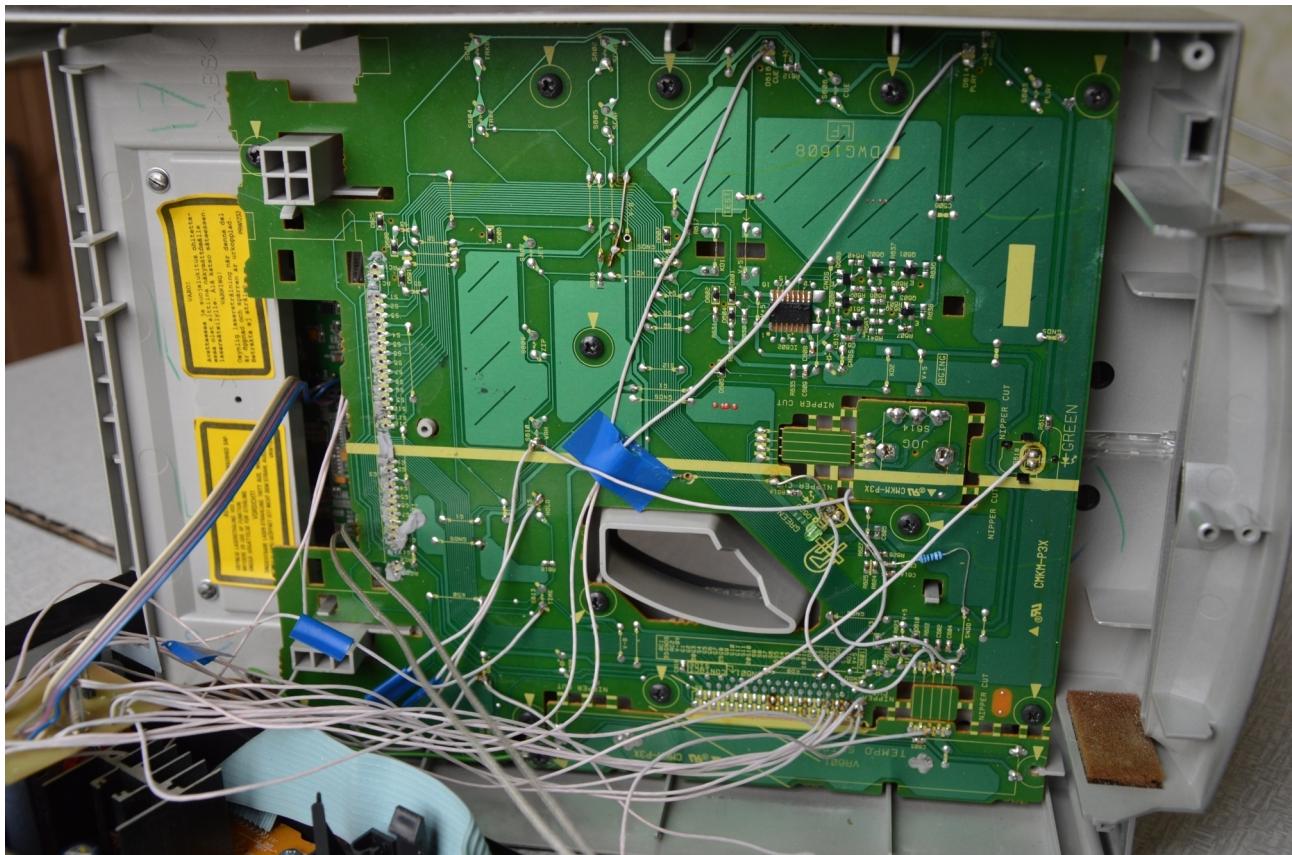
Make Custom MIDI controller board and mount it into the case of CDJ-100S. It is convenient to place USB jack on the back panel, like is shown on the picture.



Connect GNDD and V+5V outputs of the Trans board of CDJ-100S with GND and +5V lines on the Custom board.

Connect GNDD and GNDS on the Display board of CDJ-100S.

Connect V+5V, GNDD, JOG1-2, S1-S5, KD0-2, CUE, PLAY, DISC, ADIN and CT lines between Display board of CDJ-100S and Custom board in the points, designated in Connection_scheme.pdf. Cut or remove line from V+5V to pitch slider on the Display board of CDJ-100S and connect pitch slider line +5V to +3.3V line of Custom board (because ADC input in STM32F103C8 is in range 0...3.3V).



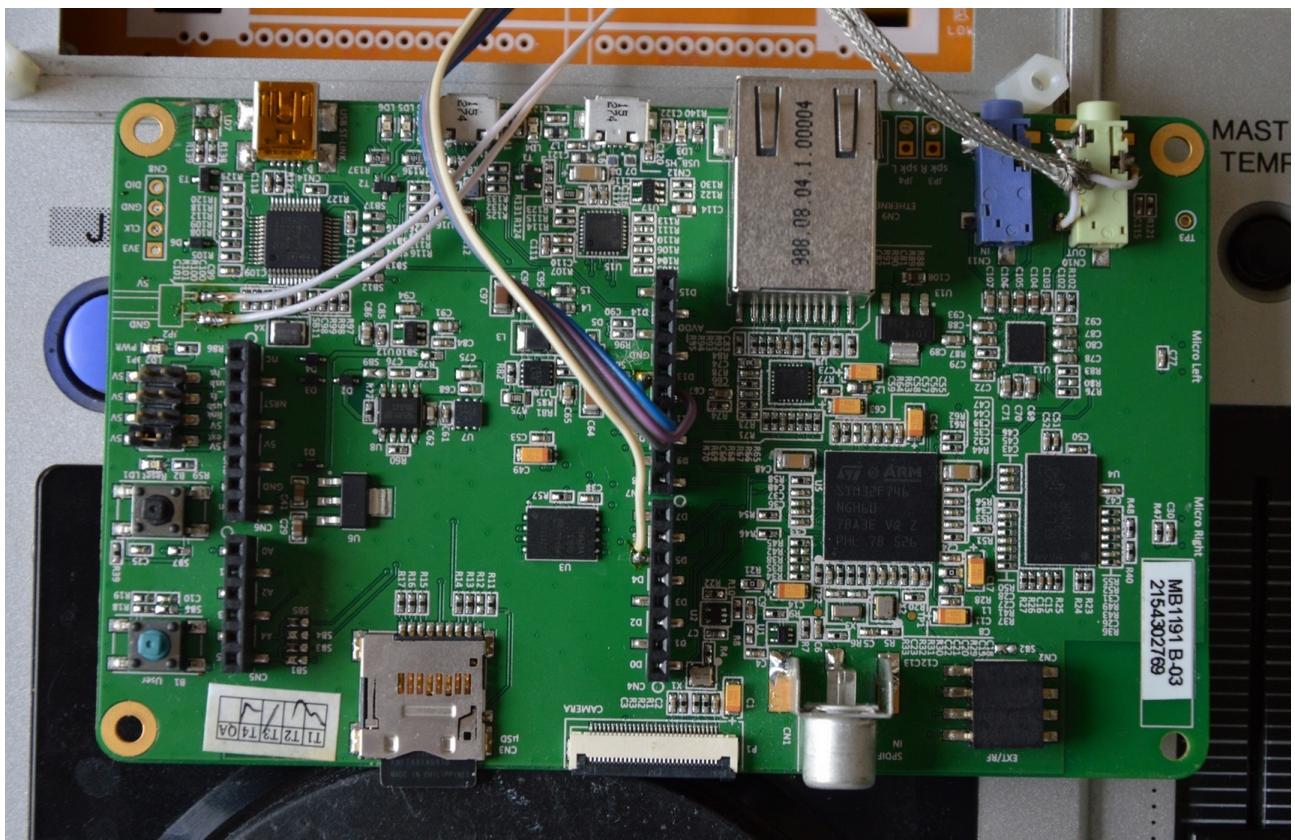
Check the connections and turn the power on the player.

Program the STM32F103C8T6 microcontroller via SWD and turn off CDJ-100S.

At this step, you can use the device as MIDI controller.

For further upgrade, on the STM32F746G-Disco board, connect:

- CN4, D5 (SPI2_NSS) – to SPI_CS (on CDJ-100S-MIDI controller board)
- CN7, D11 (SPI2_MOSI) – to SPI_MOSI
- CN7, D12 (SPI2_MISO) – to SPI_MISO
- CN7, D13 (SPI2_SCK) – to SPI_SCK
- 5V and GND – to CDJ-100S +5V power supply. Set power select jumper JP1 on the STM32F746G board to 5V ext (external power supply).
- CN10 (AUDIO OUT) – to CDJ-100S RCA connectors with a shielded audio cable.



After that, check all connections, power up the device, and program STM32F746G-Disco board via embedded ST-LINK (USB-mini connector).

Insert SD card with music. Create playlist in the Rekordbox program, and export it to SD card. Don't forget to analyze files.

Reboot the device. Now it is ready to use.

Brief operation manual

This section contains information about functionality of modernized CDJ-100S player in the current program version.

Buttons:

- PLAY/PAUSE button – acts like PLAY/PAUSE button in original CDJ-100S. Short press will switch between play and pause audio playback modes.
- CUE button – acts like CUE button in original CDJ-100S. Press while playing will stop playback at the cue position, or (if cue point doesn't set) at the zero position of the track. Press while paused will set cue point at the current position. Long press while paused will start playback as long as the CUE button is pressed.
- SEARCH buttons – rewind and forward track for 1 second, or for 1 beat (if QUANTIZE mode is on). If WAH button is pressed, press to the SEARCH buttons will start playback from the previous/next cue point of the track.
- TRACK SEARCH buttons – load previous/next track. If WAH button is pressed, press to the TRACK SEARCH buttons divide or multiply loop length by two (in LOOP mode).
- JET button – LOOP IN.
- ZIP button – LOOP OUT.
- WAH button – in current version of program, acts like SHIFT button in DJ-controllers. Affect on SEARCH and TRACK SEARCH buttons.
- HOLD button – short press acts like LOOP EXIT button. Long press will turn on/off the QUANTIZE mode.
- TIME MODE/AUTO CUE button – acts like in original CDJ-100S. Auto cue sensitivity can be adjusted in the SETTINGS mode (see below).
- MASTER TEMPO button – short press will switch between pitch range modes (WIDE, 16%, 10%, 6%).
- EJECT button is not in use.

Pitch slider acts like in original CDJ-100S. Pitch range can be selected with the MASTER TEMPO button.

JOG – in WAVEFORM mode (see below), while playing, acts like in original CDJ-100S (speed up and slow down the playback). Its sensitivity can be adjusted in the SETTINGS mode. In TRACKS mode, JOG rotation selects tracks in the list, JOG press will load selected track.

QUANTIZE mode – in this mode all cue points, loop in and loop out positions will snap to the beat grid. Long press to the HOLD button will turn on/off the QUANTIZE mode.

LOOP mode – activates after pressing LOOP IN at the loop start position and LOOP OUT at the loop end position while playing. Every pressing to the LOOP IN and LOOP OUT buttons will set current track position as the loop start or end position, respectively. To divide and multiply loop length by two, use TRACK SEARCH buttons while pressing WAH (SHIFT) button. Pressing LOOP OUT before LOOP IN may lead to unexpected behavior.

Press HOLD (LOOP EXIT) button to exit from the LOOP mode. Pressing LOOP OUT after exiting from the LOOP mode will lead to reentering it with a new loop end position.

In the current program version, there are three operation modes of the touchscreen:

WAVEFORM mode:

Touch to the time to switch between remain and elapsed time modes.

Touch the stripe at the top of the screen to switch between different modes (WAVEFORM, TRACKS and SETTINGS).

Touch the track waveform at the bottom of the screen to rewind and forward around the track.

Expand and contract the center waveform with two fingers to zoom in and zoom out the waveform.

Touch it with two fingers again to return to the default zoom.



TRACKS mode:

Swipe track list up and down to move it.

Touch the track name to select it. The selected track is highlighted with white, the currently playing track is highlighted with blue.

Swipe the selected track to the right to load it.



SETTINGS mode:

Swipe volume, auto cue and jog sensitivity bars left and right to adjust the corresponding settings.

