MEGA ENGINE
CD–ROM² PLAYER

REQUIRED TOOLS

In addition to everything included in your **DIY-KIT**, you will need a few tools to complete your build. In particular you'll need:

- a PH 1 Phillips screw driver or bit
- a T 8 Torx screw driver
- a hot glue gun (or any other glue you feel comfortable with)
- a pair of pliers or a hobby knife or a pair of small scissors.

FULL KIT vs PARTIAL KIT

Depending on availability and your order, you might have got a partial kit instead of a full kit. Items possibly missing from a partial kit are:

- a Raspberry Pi 3 A+ single board computer
- a Micro SD card with the pre-installed operating systems
- a 9.5 mm slim slot-in optical disc drive with SATA connection

If your kit includes an optical disc drive, then it will be pre-installed in the actual case already.

BUILD TIME

Building a **MEGA ENGINE** from a full kit following this guide will take you approximately 20 minutes. No soldering is required.

WHAT'S IN THE BOX?

Next the actual case, you will find the following items in your **MEGA ENGINE** „build box":

- two carrier PCBs (white)
- one USB to SATA controller cable (black)
- one USB extension cable (silver)
- one cable clip (black or white)
- one pre-assembled LED (white)
- one pre-assembled momentary switch (black)
- one pre-assembled SATA/power breakout cable (red)
- one optical drive (pre-installed in your case)
- one Pi3A+ single board computer
- one copper heatsink
- one Micro SD card (with pre-installed OS)
- one USB expansion board
- two cable ties
- one set of screws, nuts, spacers and washers

The case consists of four parts (top and bottom shells, front and back panel) as well as a small bag containing four rubber feet and four screws for closing the case after assembly.

PREPARING THE CARRIER PCBS

The L-shaped carrier PCB is the bottom one. Attach the four F/M spacers using the four nuts in the positions shown here.
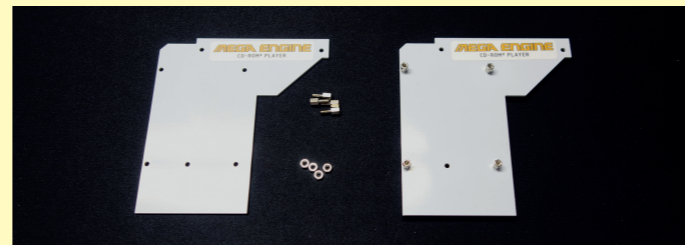
The triangular PCB is the top one. Use four Phillips screws (the 5mm long ones) and four washers to install the four F/F spacers as shown below in the middle. The washers go on the same side as the spacers. Then use the remaining four 5mm long Phillips screws to attach the USB expansion board on top of the spacers as shown.
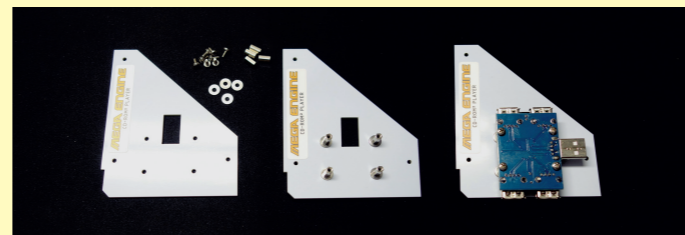
PREPARING THE PI3 SINGLE BOARD COMPUTER

Insert the Micro SD Card into the slot on the bottom of the Pi3 A+ and attach the copper heatsink to the Pi's ARM processor on the top side of the Pi3 board.

INSTALLING THE CARRIER PCBS INTO THE CASE

Use two of the torx screws and the single countersunk screw to install the triangular PCB into the top of the case. The countersunk screw sits next to the male USB connector. Don't overtighten this one. Also put the self-adhesive cable clip in the middle of the left side of the case (with the top part flipped before you, that's on your right).


Then install the L-shaped carrier PCB into the bottom part of the case using the remaining three torx screws. Make sure the nuts on the bottom of the PCB are aligned straight with the PCBs edge. Start with the torx screw on the bottom left, then the one on the right and last the top one. Make sure the nuts actually sit inside the case and not on top of the case's edge. Then use the four 4mm long Phillips screws to attach the Pi3 SOC to the top of the spacers on the bottom PCB.


PREPARING THE FRONT AND BACK PANELS

Install the pre-soldered momentary switch into the the back panel. To do this, unscrew the nut from the switch, put the switch into place and screw the nut back onto it. Make sure to tighten the nut properly.
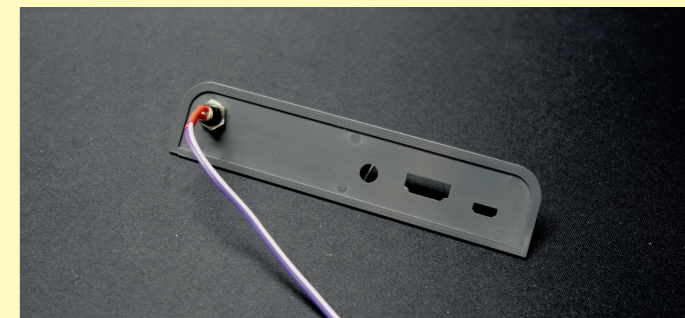

The pre-soldered white LED gets installed into the front panel. This is ideally done using a drop of hot glue or any other glue that you're comfortable using and doesn't take ages to harden. You will find the the top of the LED fits the hole perfectly, so it's easy to hold the LED in place while you wait for the glue to strengthen. This is the trickiest part of the whole build.
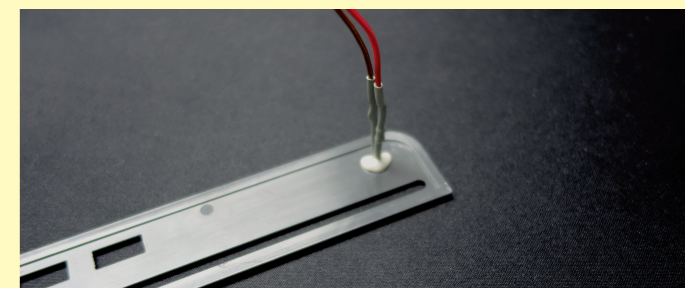
INSTALLING THE SATA/POWER SPLITTER

The red SATA breakout cable gets plugged into the back of the optical drive. The VCC pin gets connected to pin 4 of the Pi's pin header. The other cable (GND) gets connected to Pin 39. The VCC pin is the one marked with a white stripe on the connector.
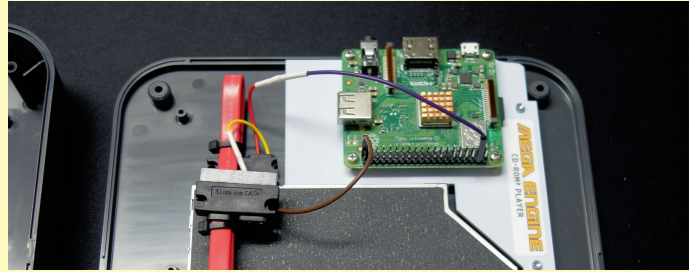

Here is an overview of all the pins on the Pi's GPIO header that you'll eventually be using. The ground pins (all the black ones) are interchangeable, but we recommend you stick to our recommendation.
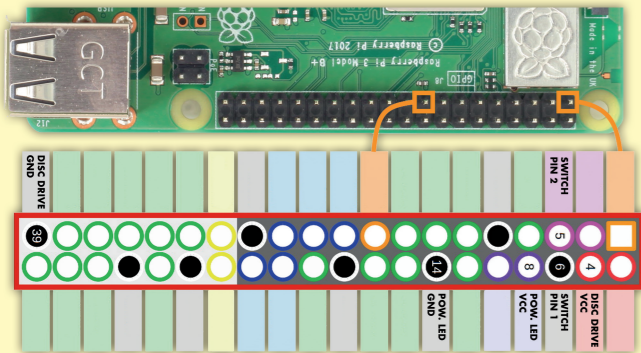
## INSTALLING THE BACK AND FRONT PANELS

Put the back panel into place and connect the two wires coming from the switch to pins 5 and 6 of the Pi's pin header. For the switch installation it doesn't matter which wire goes where.
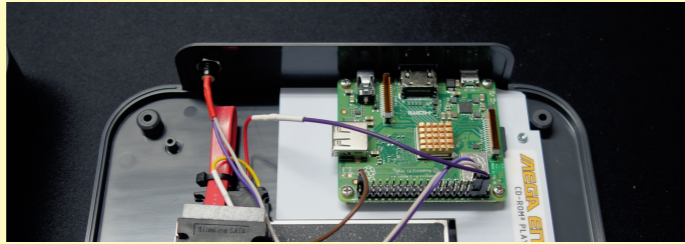
Put the front panel into place into the top part of the case, but do not yet connect the wires coming from the LED.

INSTALLING THE SATA CONTROLLER

Position the two parts of the case next to each other as shown below. The black SATA controller adapter gets plugged into the top end of the red SATA breakout cable. The USB end of the cable is plugged into the USB expansion board.
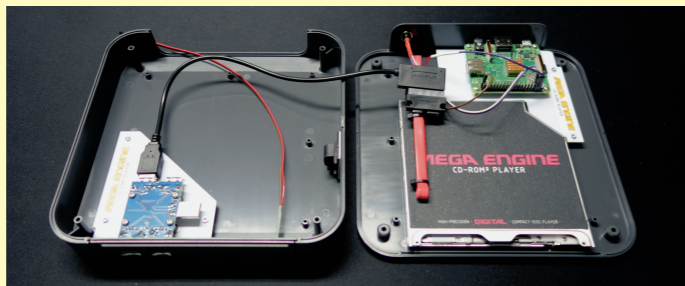

REST OF THE INTERNAL CONNECTIONS

Using the silver USB extension cable you're now connecting the male USB port on the USB expansion board to the Pi's female USB port. Route the cable through the cable clip installed earlier. This is easier if you place the top shell standing up in a right angle next to the bottom part of the case. You can route the black SATA controller cable through the same cable clip.
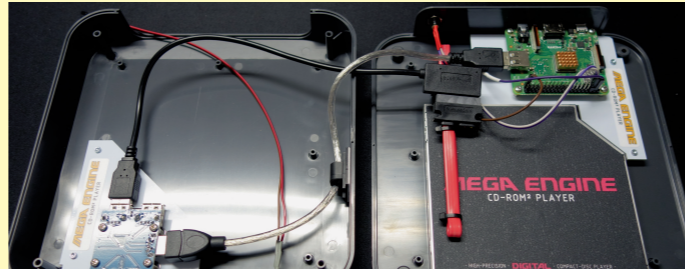
Now connect the wires from the power LED to pins 8 (VCC) and 14 (GND) of the Pi's pin header. The VCC pin of the power LED is again marked with a white stripe. Add a cable tie to the all the wires coming from the Pi's pin header (except the disc drive's ground wire) to clean up the install.
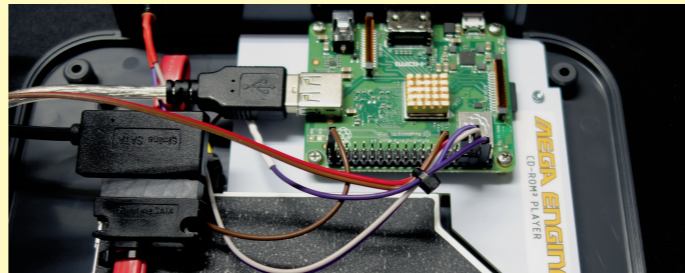
CLOSING UP

Fold the top part of the shell over and place it onto the bottom part of the shell. You might have to adjust the silver USB extension cable a bit in terms of where it sits in the cable clip. Make sure the back panel sits where it belongs. The small bag included with the case has four Phillips screws to close the case and four feet that fit neatly into the screw holes on the bottom of the case.

Congratulations! You're all done. For basic instructions on how to use your newly built **MEGA ENGINE** refer to the included pocket guide found the box with the case.

PCEWORKS

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BUILD GUIDE