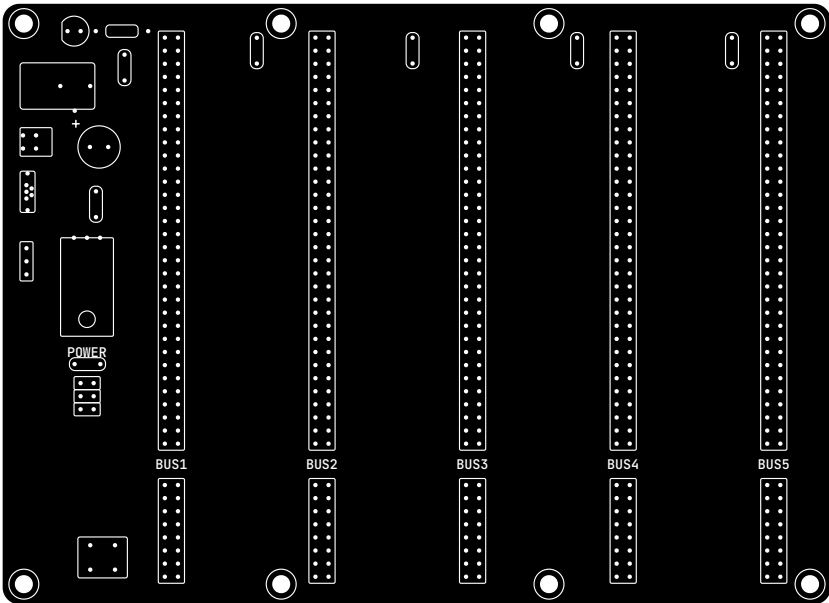


THROUGH-HOLE KIT · BUILD GUIDE

rosco_m68k

Bus board

A five-slot backplane for the rosco_m68k that also powers the whole system. Four soldering stages, then a voltage check before any card goes in.



5 slots 2×32 BUS + 2×8 EXTRA	USB or DC 5 V, OR 7-12 V	L7805 ON-BOARD REGULATOR	160 × 116 mm 448 SOLDER JOINTS
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Before you solder	2	4	Bus connectors	6
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The rosco_m68k bus board is open-source hardware by Ross Bamford and contributors (rosco-m68k.com), released under the CERN Open Hardware Licence. Kit and guide by SolderDemon.



READ FIRST

Before you solder

Tick the kit off against the packing list, then build in the order of this guide. Low parts go first, so the board always lies flat while you solder.

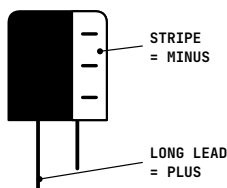
WHICH WAY ROUND

Every map shows the component side with the **power section on the left** and the five bus slots running left to right. Keep your board that way and “left”, “right” and “up” in this guide always match what you see.

YOU NEED

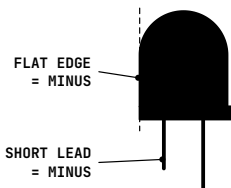
Temperature-controlled iron with a fine tip, solder 0.6–1 mm, flush cutters, small pliers, multimeter, masking tape. For repairs: flux and solder wick.

THREE PARTS THAT CAN GO IN BACKWARDS

**Electrolytic cap**

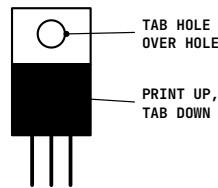
The long lead goes in the hole marked +. The stripe faces away from it.

Here: the stripe faces right.

**LED**

The flat edge of the body sits on the flat of the printed outline.

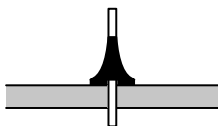
Here: the flat edge faces left.

**Regulator**

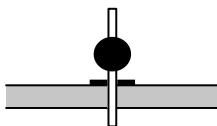
It lies flat, tab down, with the hole in the tab over the hole in the board.

Here: printed side up, legs at the top.

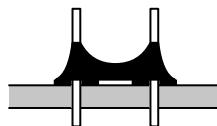
EVERY JOINT

**Good**

A small cone that wets both the pad and the lead.

**Bead on the Lead**

Solder never reached the pad. Add flux, reheat pad and lead together.

**Bridge**

Two pads joined. Draw the excess off with wick, then check the gap.

THE ROUTINE

- 1 Heat the pad and the lead together.
- 2 Feed solder into the joint, not onto the tip.
- 3 Take the solder away, then the iron. Hold still until it sets.
- 4 Trim the lead just above the cone.

NO CHIPS HERE

Nothing on this board is static-sensitive, but the cards you plug into it are. Never plug or unplug a card with the power on.

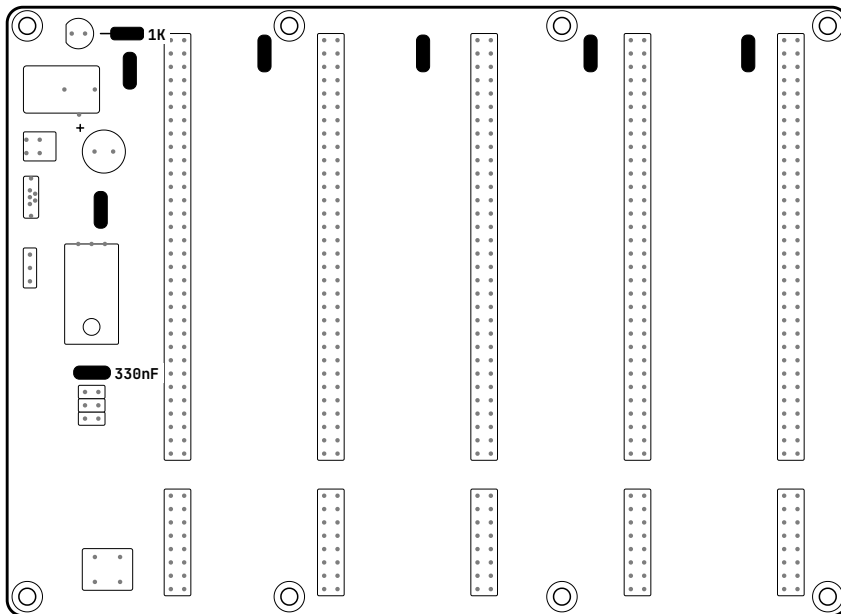
1

STAGE 1

Resistor, small capacitors

8 PARTS

16 JOINTS


☒ FIT NOW ☐ ALREADY FITTED ☐ LATER

NO LABEL ON THE MAP = 100nF

PART	QTY	MARKED	POSITIONS
☐ 1K resistor	1	brown black red	R1, top left
☐ 100nF ceramic	6	104	C2-C6 C8
☐ 330nF ceramic	1	334	C7, below the regulator

HOW

- None of these has polarity. Bend the leads, press the part flat on the board, solder, trim.
- C2-C5 sit along the top edge between the slots. Seat them low: cards will stand right next to them.

LOOK-ALIKES

The 330nF (C7) looks like the 100nF. Read the code: 334, not 104. It belongs at the regulator input.

BEFORE STAGE 2

☐ 8 parts fitted, none left over

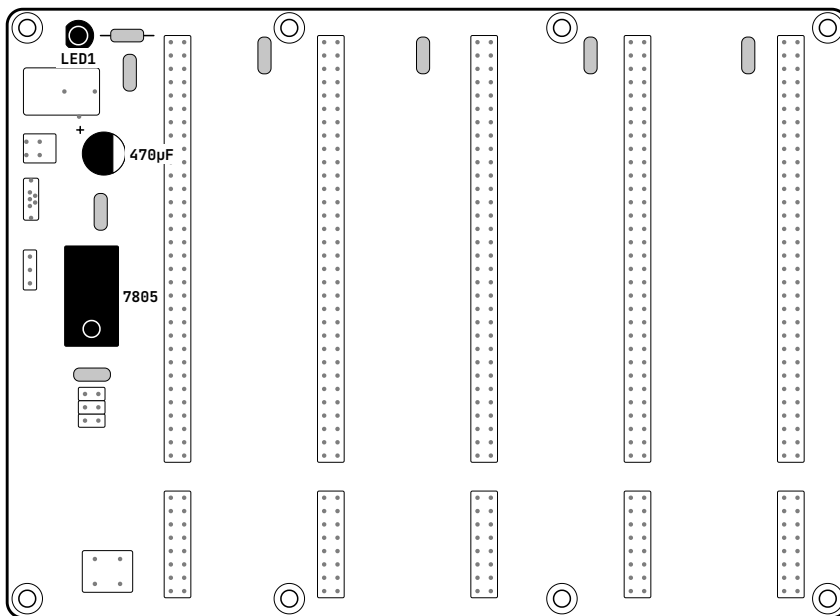
☐ Every lead trimmed

2

STAGE 2

LED, regulator, reservoir

3 PARTS

7 JOINTS


☒ FIT NOW
 ☐ ALREADY FITTED
 ☐ LATER

PART	QTY	POSITIONS	WHICH WAY
☐ LED 5 mm	1	LED1	flat edge and short lead left
☐ L7805 regulator	1	U1	flat, tab down, hole over hole
☐ 470µF electrolytic	1	C1	long lead in + hole (left), stripe right

HOW

- LED1: solder one lead, check the LED stands straight, then the other.
- U1: with pliers, bend all three legs down 90° where they narrow. Lay it on the board, tab down, legs in their holes, the tab hole over the board hole. Bolt it down if you have an M3 screw and nut, then solder.
- C1 last. Push it flat, then solder.

POLARITY

A reversed regulator feeds the input voltage straight to the bus. A reversed electrolytic can burst. Check the tab and the stripe against the map before soldering.

The regulator gets warm when it is in use. That is normal.

BEFORE STAGE 3 ☐ LED1: flat edge left ☐ U1: printed side up ☐ C1: stripe right

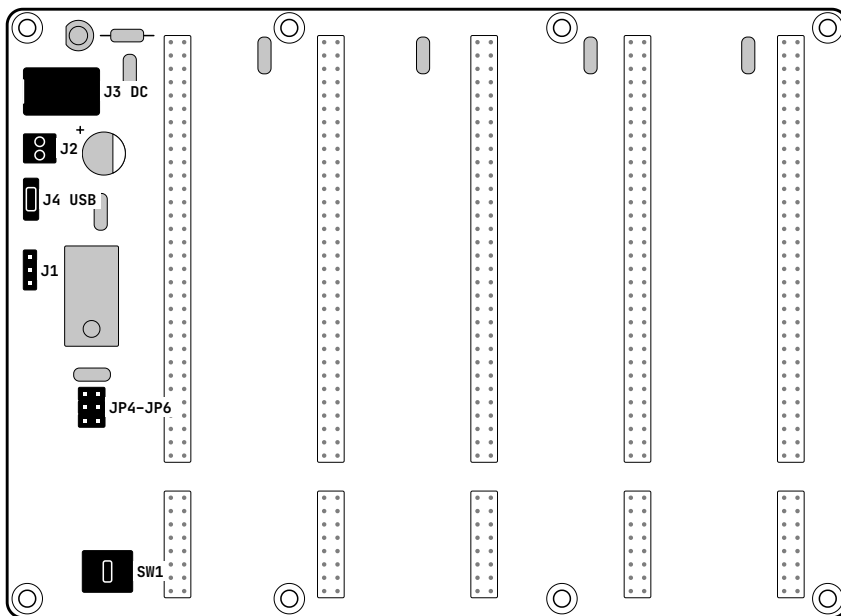
3

STAGE 3

Power inputs and switch

8 PARTS

25 JOINTS



 FIT NOW  ALREADY FITTED  LATER

PART	QTY	POSITIONS	WHICH WAY
☐ DC jack	1	J3	opening to the left edge
☐ Screw terminal 2-way	1	J2	wire openings to the left edge
☐ Micro USB	1	J4	fits one way
☐ Header 1×3	1	J1	short pins into the board
☐ Header 1×2	3	JP4–JP6	short pins into the board
☐ Power switch	1	SW1	bottom left; fits one way

HOW

- 1 J4 first. Its pins are fine: flux, a small tip, then check every gap with a magnifier.
- 2 J3, J2, SW1: push flat, solder one pin, check, then the rest. The jack tabs need a few seconds of heat each.
- 3 Headers last: tack one pin, check upright, then the rest.

NO JUMPER YET

Leave JP4–JP6 empty: the cap's place depends on your supply (page 7). J1 brings out the USB data lines; the bus does not use them.

BEFORE STAGE 4 ☐ J4: no bridges ☐ Jack, terminal, switch flat ☐ No cap yet



STAGE 4

Bus connectors

10 PARTS

400 JOINTS



PART	QTY	POSITIONS	WHICH WAY
☐ Header 2×32	5	BUS1-BUS5, long rows	short pins into the board, long pins up
☐ Header 2×8	5	below each long row	short pins into the board, long pins up

HOW

- 1** Push the header in and turn the board over onto a flat surface, so the header is held square.
- 2** Solder one pin at each end. Check from two sides that it stands upright. Fix it now if not.
- 3** Solder the rest. 400 joints: do one slot, take a break, do the next.

LINE THEM UP

Cards plug onto these pins. A header that leans, or a 2x8 offset from its 2x32, will not take a card.

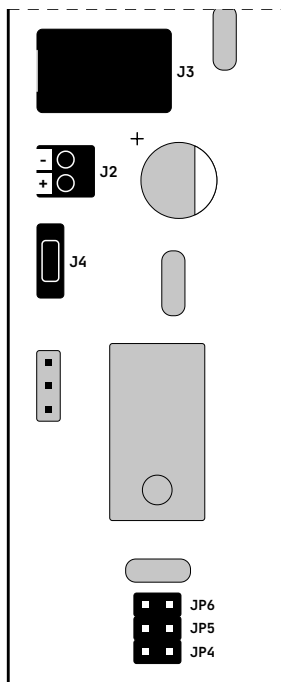
All 5 slots are identical, wired pin for pin.

BEFORE POWER

- ☐
- All headers upright
- ☐
- No bridges between rows
- ☐
- Every pin soldered

BEFORE THE FIRST CARD

Choosing the supply


ONE SUPPLY, ONE JUMPER CAP

SUPPLY	INTO	CAP ON
USB charger or computer port	J4	JP4
Regulated 5 V DC	J3 or J2	JP5
7–12 V DC, through the 7805	J3 or J2	JP6

NEVER TWO CAPS

Two caps join two supplies. With JP5 and JP6 together, or JP5 on a supply above 5 V, the full input voltage reaches every card.

J3 takes a centre-positive plug. On J2 the + screw is the lower one, as marked on the map. SW1, bottom left, switches the DC inputs and USB together.

FIRST TEST, NO CARDS FITTED

- 1 Fit the cap for your supply, connect the supply, switch SW1 on.
- 2 LED1 lights.
- 3 Multimeter on DC volts at any slot: pin 2 (top of the right-hand row) to pin 6 (third down in the same row). Expect 4.75 to 5.25 V.
- 4 Switch off. Now fit the main board and cards, always with the power off.

SOMETHING ELSE HAPPENS? SWITCH OFF FIRST.

- **LED1 stays dark:** check the cap is on the row for your supply, the switch is on, and the LED's flat edge faces left.
- **Voltage near 0 with 7–12 V in:** regulator turned over, or the cap is not on the regulator row.
- **More than 5.25 V:** switch off at once. Wrong cap for the supply.
- **Regulator too hot to touch:** the cards draw more than it can give from that input voltage. Use a lower input voltage or a 5 V supply.

REFERENCE

Bus pinout

The same on every slot, seen from above with the board as on the maps: odd pins in the left row, pin 1 at the top. Signal names as on the board design.

1	A1	VCC	2
3	A2	CLK	4
5	A3	GND	6
7	A4	VPA	8
9	A5	E	10
11	A6	VMA	12
13	A7	MFPIE0	14
15	A8	I0SEL	16
17	A9	EXPSEL	18
19	A10	FC0	20
21	A11	FC1	22
23	A12	FC2	24
25	A13	IPL0	26
27	A14	IPL1	28
29	A15	IPL2	30
31	A16	LDS	32

33	A17	UDS	34
35	A18	RESET	36
37	A19	D15	38
39	A20	D14	40
41	A21	D13	42
43	A22	D12	44
45	A23	D11	46
47	AS	D10	48
49	BERR	D9	50
51	B6	D8	52
53	BGACK	D7	54
55	BR	D6	56
57	DTACK	D5	58
59	RW	D4	60
61	D0	D3	62
63	D1	D2	64

The 2x8 header below each slot carries 16 spare lines, EXT1 to EXT16, joined slot to slot and to nothing else: cards can use them to talk to each other.



STILL STUCK? WE WILL HELP.

Send clear photos of both sides of the board, the supply you use and where the jumper cap sits.

solderdemon.com/docs

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