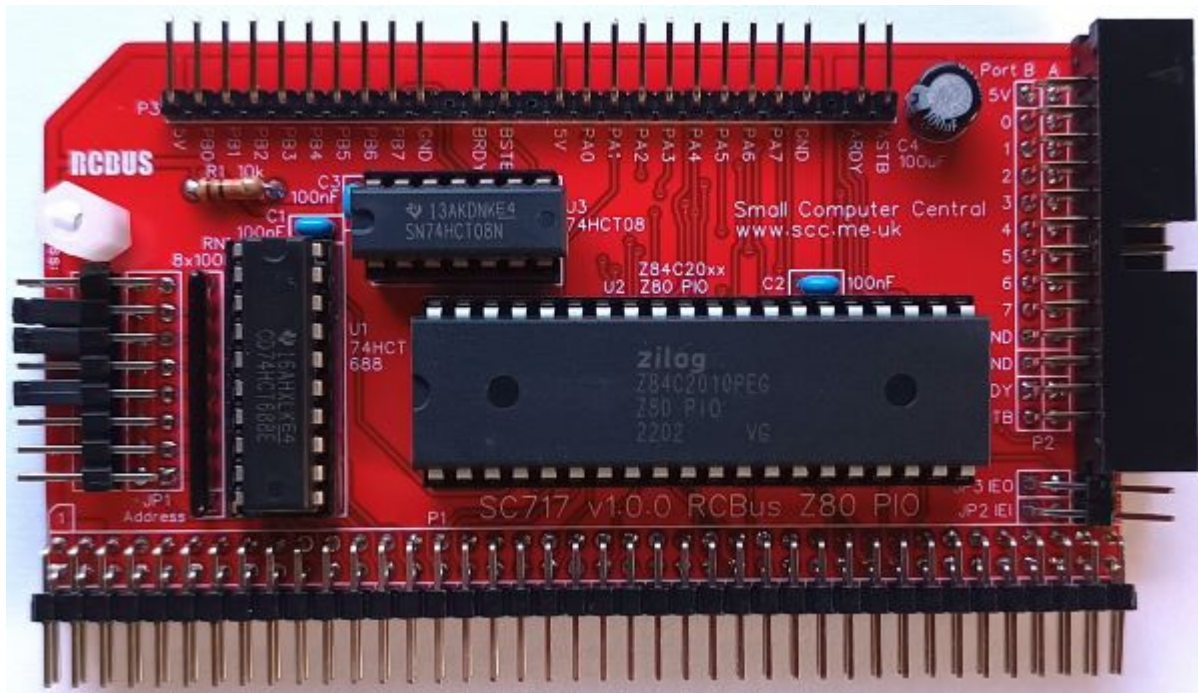


Small Computer Central

SC717 – RCBus Z80 PIO Module

SC717 is a digital I/O module using a Z80 PIO.



- SC717 – Assembly guide
- SC716 – Compatibility
- SC717 – Parts list
- SC717 – Printed circuit board
- SC717 – User guide
- SC700 series information (<https://smallcomputercentral.com/rcbus/sc700-series/>)
- SC700 series support (<https://smallcomputercentral.com/support/>)

Downloads

- SC717, v1.0, Kit contents sheet (PDF) (https://smallcomputercentral.com/wp-content/uploads/2023/05/sc717-kit-contents_v1.0.0_2023-05-17-1.pdf)
- SC717, v1.0, Schematic (PDF) (https://smallcomputercentral.com/wp-content/uploads/2023/05/sc717_v1.0.0_2023-05-07_16-59_schematic.pdf)
- SC717, v1.0, PCB design files (OSHWLab) (<https://oshwlab.com/sccousins/sc717-v1-0-z80-pio>)
- SC717, v1.0, Gerber files (ZIP)
(https://drive.google.com/file/d/1si5LoGBU0fKYtOVxtBzSL7FzL1JdL8ir/view?usp=share_link)

Errata

- PCB SC717 v1.0.0 has header pins JP2/3 very tight against the box header P2 so it is best to file a little off the plastic of JP2/3 before soldering it in place

Suppliers

Kits	Website	From	Currency
Small Computers Direct	SCDirect (https://small-computers-direct.square.site/s/search?q=sc717)	UK	GBP
Stephen C Cousins	Tindie (https://www.tindie.com/search/?q=sc717)	UK	USD
Small Computer Central	Lectronz (https://lectronz.com/products/search?q=sc717)	UK	Euro/USD
PCBs	Website	From	Currency
Small Computers Direct	(https://small-computers-direct.square.site/s/search?q=sc733)SCDirect (https://small-computers-direct.square.site/s/search?q=sc717)	UK	GBP
Stephen C Cousins	Tindie (https://www.tindie.com/products/tindiescx/picknmix-boards-for-rcbus-80pin/)	UK	USD
Small Computer Central	Lectronz (https://lectronz.com/products/pick-n-mix-boards-for-rcbus-80pin/)	UK	Euro/USD
Assembled and Tested	Website	From	Currency
Not available			
Components			
See parts list			

Small Computers Direct does not collect VAT for EU countries

Tindie does not collect VAT for EU countries

Lectronz does collect EU VAT for orders up to 150 EUR

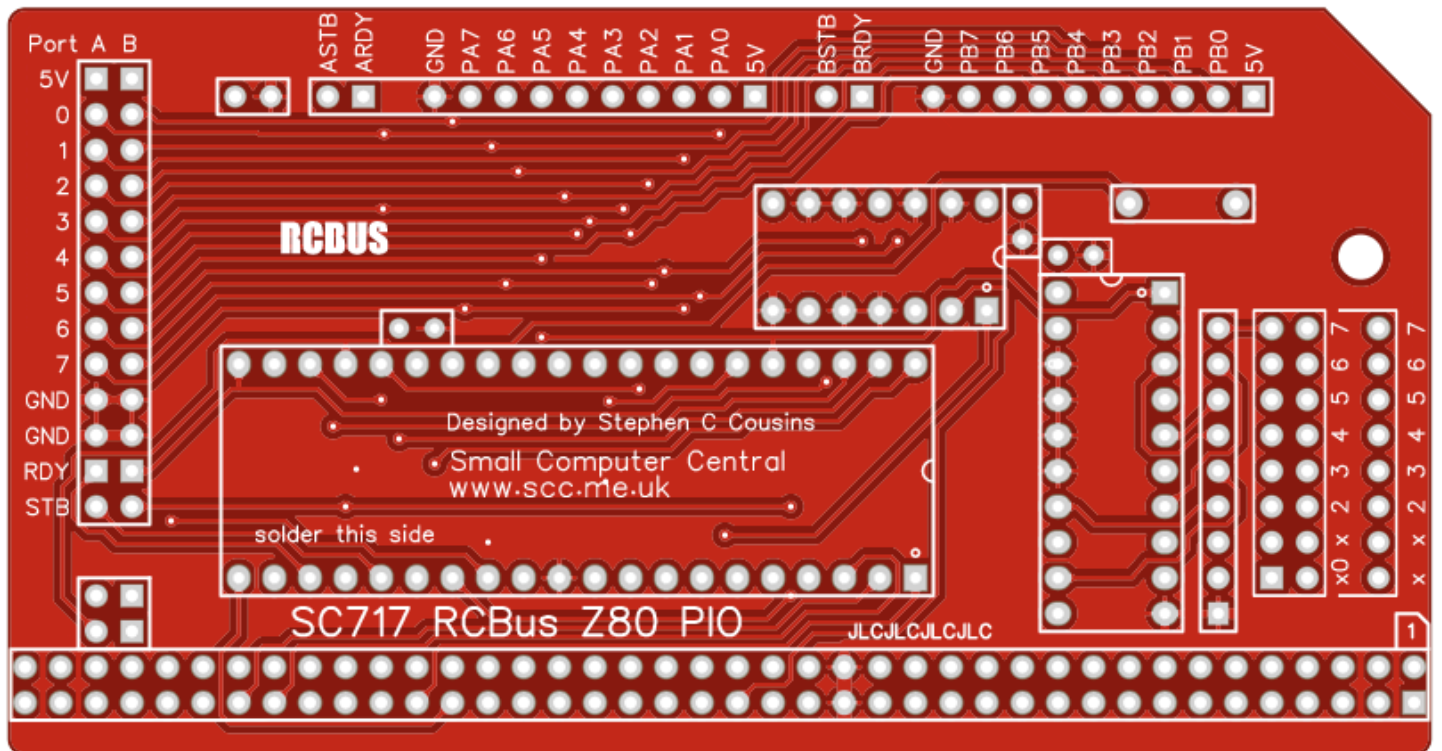
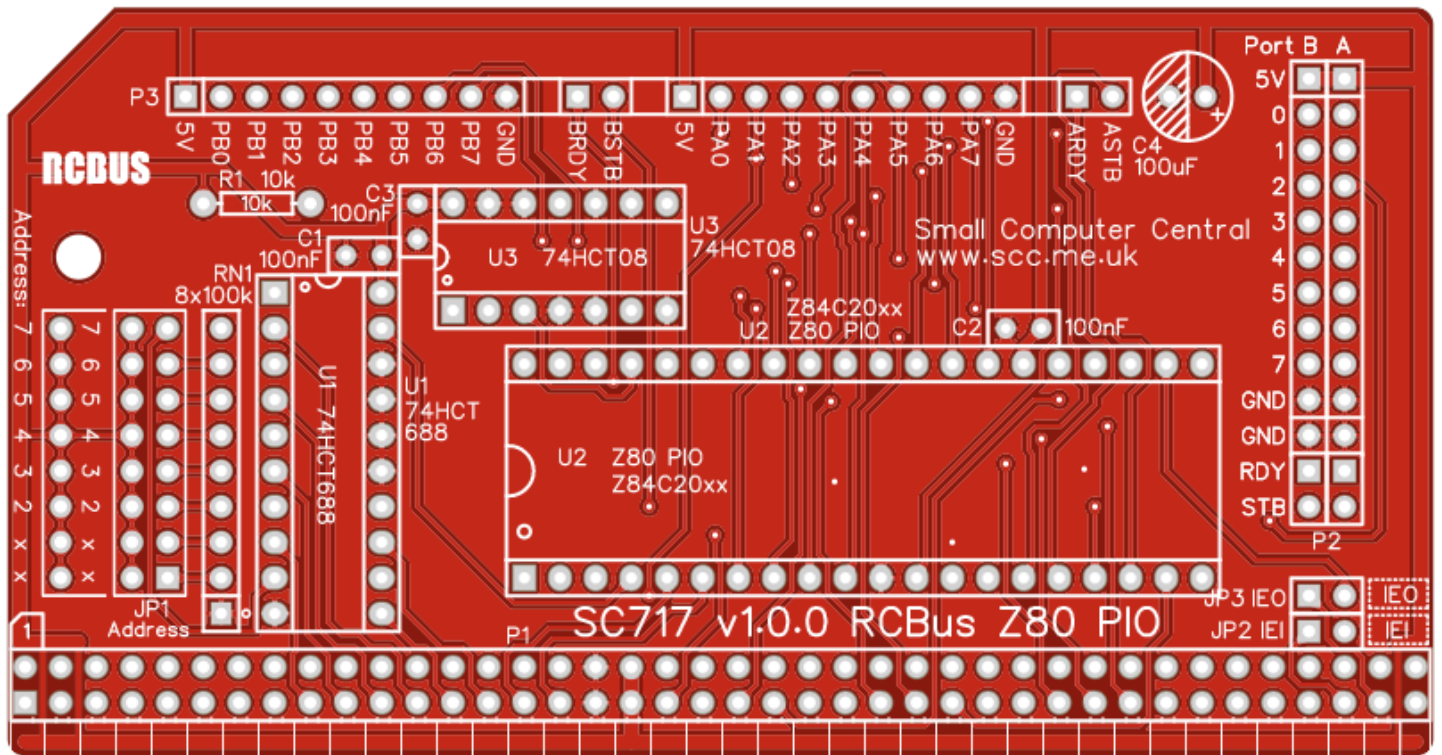
Parts List

Reference	Qty	Component
PCB	1	SC717, v1.0, PCB

C1 to C3	3	Capacitor, ceramic, 100 nF
C4	1	Capacitor, electrolytic, 100 μ F
JP1	1	Header, male, 2 row x 8 pin, angled
JP2 + JP3	1	Header, male, 2 row x 2 pin, angled
Jumper	8	Jumper shunt
P1	1	Header, male, 2 row x 40 pin, angled
P2	1	Box header, 2 x 13 pin, angled, or Header, male, 2 x 13 pin, angled
P3	1	Header, male, 1 row x 27 pin, angled
R1	1	Resistor, 10k, 0.25W
RN1	1	Resistor network, 8x100k, SIL, 9-pin
Screw (for spacer)	1	Machine screw, 6mm, M3
Spacer	1	Spacer, 10mm, M3, nylon
U1	1	74HCT688
U2	1	Z80 PIO Z84C2008, or Z80 PIO Z84C2010
U3	1	74HCT08
IC socket 20-pin U1	1	Socket, DIP, 20-pin
IC socket 40-pin U2	1	Socket, DIP, 40 pin
IC socket 14-pin U3	1	Socket, DIP, 14-pin

Component details and sourcing (<https://smallcomputercentral.com/components/>)

Printed Circuit Board



User Guide

SC717 is a digital I/O module using a Z80 parallel I/O chip (Z80 PIO) which has 16 general purpose I/O pins plus 4 handshaking pins.

The device address is set with jumpers. All of the I/O pins are available on header pins on the top edge of the PCB and also on a header on the back edge of the PCB.

The module supports the Z80 interrupt priority chain with jumpers to allow it to use the bus pins specified in the RCBus specification. Alternatively, the IEI and IEO signals are available on JP2 and JP3.

Details about programming a Z80 PIO can be found in the Z80 PIO datasheet (PDF) (<https://drive.google.com/file/d/1ZCt1S1F0NASjZ3dQNYdnT6eiGw-Io9a6/view?usp=sharing>).

Example application: Alphanumeric LED (4-bit parallel) (<https://smallcomputercentral.wordpress.com/example-alphanumeric-lcd/>)

Input/output port functions

<i>I/O Address</i>	<i>Read</i>	<i>Write</i>
Configurable *1 base address	Read Z80 PIO	Write Z80 PIO
base + 0	Port A data	Port A data
base + 1	Port B data	Port B data
base + 2	Port A control	Port A control
base + 3	Port B control	Port B control

1. The RCBus I/O base address should be set to match the software you are using. Typically, this is 0x68 (binary 0110 1000).

Jumper options

<i>Jumper</i>	<i>Function</i>
JP1	Set module's RCBus I/O base address The suggested address is 0x68 (binary 0110 1000)
JP2	Connects bus IEI signal to PIO IEI signal The default is jumper shunt not fitted
JP3	Connects bus IEO signal to PIO IEO signal The default is jumper shunt not fitted

Assembly Guide

Below is the suggested order of assembly. A general guide to assembling circuit boards can be found here (<https://smallcomputercentral.com/assembly-guide/>).

1. Resistors R1
These can be fitted either way around
2. Header pins P3
Remove pins 11, 14 and 25 to match the holes in the PCB. Pull the pins out of the plastic with pliers, supporting the plastic so as not to break it..
3. Decoupling capacitors C1 to C3
These can be fitted either way around
4. Sockets for U1 to U3
Fit such that the notch in the socket matches the curve in the outline on the PCB silkscreen
5. Resistor network RN1
This must be fitted the correct way around whereby the dot on the component matches the dot on the PCB silkscreen
6. Bus header P1
Make sure the pins are parallel to the PCB so that the board is vertical when it is fitted into a backplane

socket

7. Header pins JP1

8. Header pins JP2 plus JP3

This is very tight against the box header P2 so it is best to file a little off the plastic of JP2/3 before soldering it in place

9. Capacitor C4

This must be fitted the correct way around, as described here (<https://smallcomputercentral.com/assembly-guide/>)

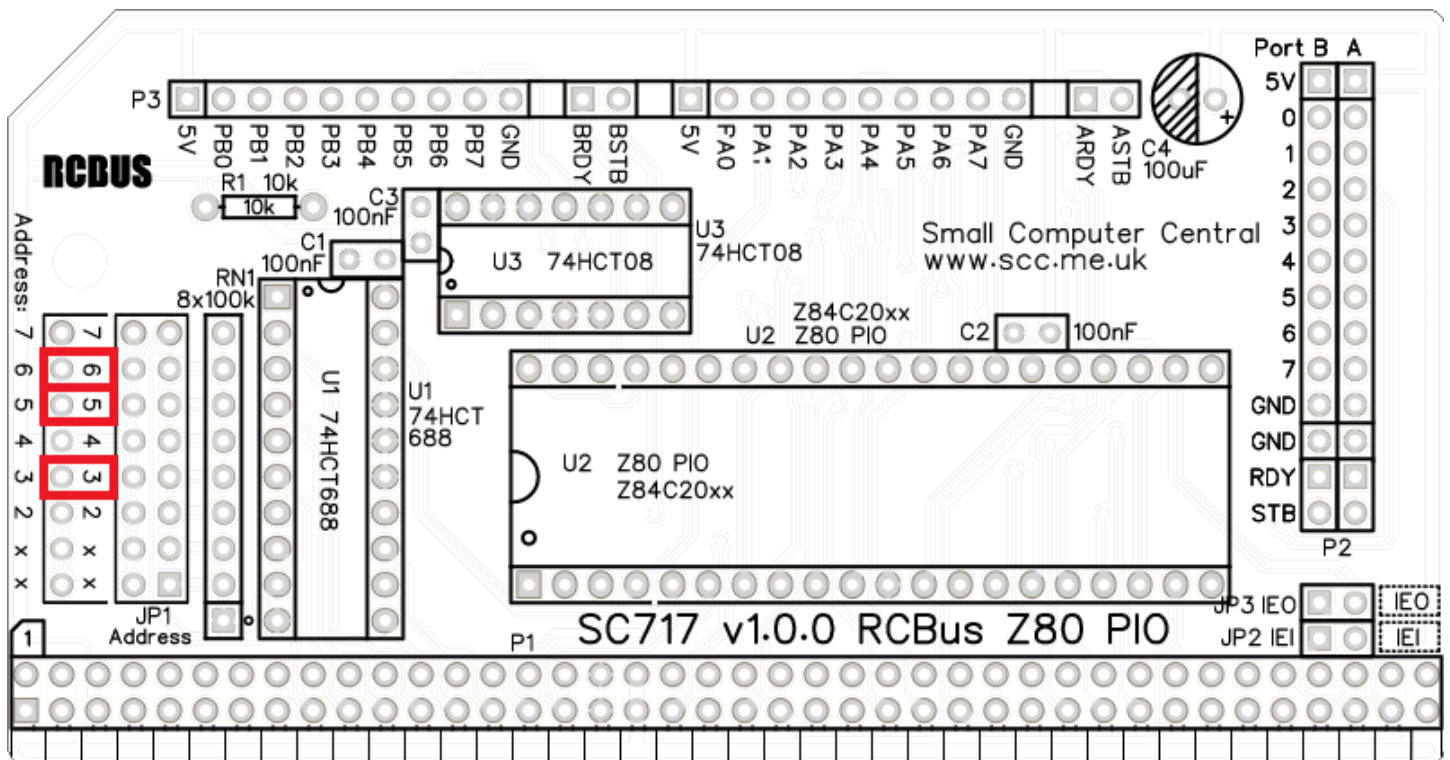
10. Box header or header pins P2

11. Insert the integrated circuits into their sockets

Make sure the notch in the component is at the end indicated by the notch in the socket and the curve on the PCB silkscreen

12. Fit the nylon spacer in the mounting hole

Fit jumper shunts in the positions shown below. All other jumpers are optional and should only be fitted if the feature is required.



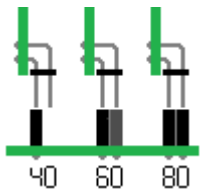
The suggested base I/O address is 0x68 (binary 0110 1000)

Compatibility

This module conforms to the RCBus specification v1.0 (<https://smallcomputercentral.com/rcbus/>) for RCBus-2014 and RCBus-Z80.

The RCBus specification includes RCBus-2014 (both RC2014 standard 40-pin bus and RC2014 enhanced 60-pin bus) and also the full 80-pin RCBus. The 80-pin RCBus provides support for advanced Z80 features, such as the interrupt daisy-chain, as well as support for other processor families.

The table below indicates electrical compatibility with each backplane type (40, 60 and 80 pin)



Backplane	?	Compatibility notes
RCBus 80-pin	✓	Fully supported
RCBus 60-pin (RC2014 enhanced)	✓	Limitations: Optional mode 2 interrupt chain requires wires between modules
RCBus 40-pin (RC2014 standard)	✓	Limitations: Optional mode 2 interrupt chain requires wires between modules

Notes

- This product is designed for hobby use and is not suitable for industrial, commercial, or safety-critical applications.
- The product contains small parts and is not suitable for young children.