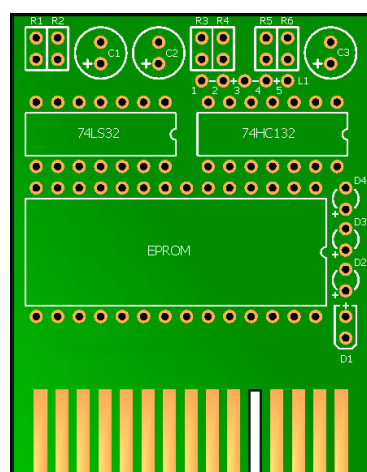


ZXC1 Interface 2 ROM Cartridge Configurations

The ZXC1 ROM cartridge PCB supports 27C64 (8K), 27C128 (16K), 27C256 (32K) and 27C512 (64K) EPROMs and can be populated to produce a variety of configurations. The following diagram shows the PCB and indicates the function of the components.



R1, R2 and C1 control the A15 line.
R3, R4 and C2 control the /ROMCS line.
R5, R6 and C3 control the A14 line.

L1 selects 64K cartridge format.

3mm 5V LEDs with integral resistors:
- D4 indicates the state of the A15 line
- D3 indicates the state of the /ROMCS line
- D2 indicates the state of the A14 line

D1 is required if the Spectrum ROM will be paged back into the memory map, else a wire link must be fitted.

Single Image Configurations

These configurations all require the 74LS32 and 74HC132 ICs to be fitted; with the other components dictating the configuration as shown in the following table. The resistor and capacitor values set the timing between bank switches and should be increased if it is found that paging occurs too quickly. LEDs D2, D3 and D4 can optionally be fitted to indicate when bank paging occurs.

Cartridge	EPROM	L1	R1	R2	C1	R3	R4	C2	R5	R6	C3	D1
8K	27C64	1-2 3-4	Short	Omit	Omit	Short	Omit	Omit	Short	Omit	Omit	Short
16K	27C128	1-2 3-4	Short	Omit	Omit	Short	Omit	Omit	Short	Omit	Omit	Short
16K	27C256	1-2 3-4	Short	Omit	Omit	Short	Omit	Omit	Omit	Short	Omit	Short
16K	27C512	1-2 3-4	Omit	Short	Omit	Short	Omit	Omit	Omit	Short	Omit	Short
16K + Page Out	27C128	1-2 3-4	Short	Omit	Omit	330k	33k	100µ	Short	Omit	Omit	1N4148
16K + Page Out	27C256	1-2 3-4	Short	Omit	Omit	330k	33k	100µ	Omit	Short	Omit	1N4148
16K + Page Out	27C512	1-2 3-4	Omit	Short	Omit	330k	33k	100µ	Omit	Short	Omit	1N4148
32K	27C256	1-2 3-4	Short	Omit	Omit	Short	Omit	Omit	22k	220k	100µ	Short
32K	27C512	1-2 3-4	Omit	Short	Omit	Short	Omit	Omit	22k	220k	100µ	Short
32K + Page Out	27C256	1-2 3-4	Short	Omit	Omit	470k	47k	100µ	22k	220k	100µ	1N4148
32K + Page Out	27C512	1-2 3-4	Omit	Short	Omit	470k	47k	100µ	22k	220k	100µ	1N4148
48K	27C512	1-2 3-4	33k	330k	100µ	Short	Omit	Omit	22k	220k	100µ	Short
48K + Page Out	27C512	1-2 3-4	33k	330k	100µ	560k	56k	100µ	22k	220k	100µ	1N4148
64K	27C512	2-3 4-5	33k	330k	100µ	220k	22k	100µ	47k	470k	100µ	Short

Multiple Image Configurations (Jumper Selected)

It is possible to include multiple ROM images within one ROM cartridge selectable via jumper links.

Cartridge	EPROM	Configuration
2 x 16K	27C256	As 16K except the 2 banks are selected using jumpers fitted in place of R5 and R6. Bank 1: R5=open, R6=closed Bank 2: R6=closed, R6=open
2 x 16K + Page Out	27C256	As 16K + Page Out but with the same modifications listed for 2 x 16K.
4 x 16K	27C512	As 16K except the 4 banks are selected using jumpers fitted in place of R1, R2, R5 and R6. Bank 1: R1=open, R2=closed, R5=open, R6=closed Bank 2: R1=open, R2=closed, R5=closed, R6=open Bank 3: R1=closed, R2=open, R5=open, R6=closed Bank 4: R1=closed, R2=open, R5=closed, R6=open
4 x 16K + Page Out	27C512	As 16K + Page Out but with the same modifications listed for 4 x 16K.
2 x 32K	27C512	As 32K except the 2 images are selected using jumpers fitted in place of R1 and R2. Bank 1: R1=open, R2=closed Bank 2: R1=closed, R2=open
2 x 32K + Page Out	27C512	As 32K + Page Out but with the same modifications listed for 2 x 32K.

Multiple Image Configurations (Switch Selected)

It is possible to include multiple ROM images within one ROM cartridge selectable via 2-way SPST DIL switches. Ideally a 1-way DIL switch would be used for some of the configurations but these are not readily available. A 2-way switch must be fitted instead, with the second switch set to the open position.

Cartridge	EPROM	L1	Configuration
2 x 16K (Switched)	27C256	1-2 4-5	Omit 74HC132, R1, R4, R5, C1, C2, C3 Fit 74LS32, R2=10k, R3=short, R6=10k, D1=short, D4=short, 74HC132 pin 3-4=short, 74HC132 pin 8-9=short, 74HC132 pin 11-12=short, Fit 2-way DIL switch in 74HC132 pins 4-11 and 5-10 Bank 1: DIL switch 4-11=open, DIL switch 5-10=closed Bank 2: DIL switch 4-11=open, DIL switch 5-10=open
4 x 16K (Switched)	27C512	1-2 4-5	Omit 74HC132, R1, R4, R5, C1, C2, C3 Fit 74LS32, R2=10k, R3=short, R6=10k, D1=short, D4=short, 74HC132 pin 3-4=short, 74HC132 pin 8-9=short, 74HC132 pin 11-12=short, Fit 2-way DIL switch in 74HC132 pins 4-11 and 5-10 Bank 1: DIL switch 4-11=closed, DIL switch 5-10=closed Bank 2: DIL switch 4-11=closed, DIL switch 5-10=open Bank 3: DIL switch 4-11=open, DIL switch 5-10=closed Bank 4: DIL switch 4-11=open, DIL switch 5-10=open
2 x 32K (Switched)	27C512	1-2 4-5	Omit R1, R3, C1, C2 Fit 74LS32, 74HC132, 2-way DIL switch across the holes for C1 and C2, R2=10k, R4=short, R5=10k, R6=100k, C3=100μ, D1=short Image 1: DIL top switch=open, DIL bottom switch=don't care Image 2: DIL top switch=closed, DIL bottom switch=don't care

Minimal Circuitry Configurations

It is also possible to produce 16K, 2 x 16K and 4 x 16K cartridges using fewer components.

Cartridge	EPROM	L1	Configuration
16K (Minimal)	27C128	1-2 4-5	Omit 74HC132, R1, R4, R5, C1, C2, C3 Fit 74LS32, R2=short, R3=short, R6=short, D1=short, 74HC132 pin 3-4=short, 74HC132 pin 8-9=short, 74HC132 pin 11-12=short
2 x 16K (Minimal)	27C256	1-2 4-5	As 16K (Minimal) above except the 2 banks are selected using jumpers fitted in place of R5 and R6. Bank 1: R5=closed, R6=open Bank 2: R5=open, R6=closed
4 x 16K (Minimal)	27C512	1-2 4-5	As 16K (Minimal) above except the 4 banks are selected using jumpers fitted in place of R1, R2, R5 and R6. Bank 1: R1=closed, R2=open, R5=closed, R6=open Bank 2: R1=closed, R2=open, R5=open, R6=closed Bank 3: R1=open, R2=closed, R5=closed, R6=open Bank 4: R1=open, R2=closed, R5=open, R6=closed

Notes

EPROMs manufactured by Texas Instruments, identified by the designator TMS27Cxxx, appear to be incompatible with the Spectrum.