

## RelaiXed component table

Designator	Footprint	LibRef	Value	Count	Conrad		Display		Farnell	
					Art.nr.	Price	Art.Nr.	Price	Art.Nr.	Price
<b>Q5P, Q6P</b>	TO92	BC327		2	154563 - 89	€ 0,18	01.40.BC327.25		<a href="#">1097285</a>	€ 0,07
<b>Q1D, Q1P, Q2P, Q2D</b>	TO92	BC337		4	154598 - 89	€ 0,18	01.40.BC337.25		<a href="#">8734666</a>	€ 0,11
<b>C10P, C11P, C16P, C17P, C22P</b>	CAPRAD-RM3.5	Cap Pol1	100uF	5	442055 - 89	€ 0,12	81.01.100U.35		<a href="#">1144627</a>	€ 0,32
<b>C3D</b>	CAPAX-RM15	Cap Pol1	22uF	1	471658 - 89	€ 0,30	81.00.22U.35		<a href="#">9418890</a>	€ 0,16
<b>C12P, C13P, C14P, C15P, C18P, C19P, C20P, C21P</b>	CAPRAD-RM5	Cap Pol1	470uF	8	446134 - 89	1,26	81.01.470U.35		<a href="#">1144629</a>	€ 0,68
Or alternative:					441987 - 89	€ 0,15				
<b>C5P</b>	CAPRAD-RM2.5	CapCer	100nF	1	453099 - 89	€ 0,29	81.15.100N		<a href="#">1469310</a>	€ 0,39
<b>C1L, C1R, C2L, C2R, C2P, C4P, C7P, C9P</b>	CAPRAD-RM2.5	CapCer	10nF	8	453064 - 89	€ 0,21	81.15.10N		<a href="#">1216435</a>	€ 0,18
<b>C1D, C1P, C2D, C3P, C6P, C8P, C23P, C123P, C24P, C25P, C26P, C28P, C40P, C140P</b>	CAPRAD-RM2.5	CapCer	47nF	14	453080 - 89	€ 0,26	81.15.47N		<a href="#">1216437</a>	€ 0,18
Or alternative:										
<b>C24P, C25P, C26P, C28P, C1R, C2R, C1L, C2L</b>	SMD 0805	CapC0G	22nF						<a href="#">1457738</a>	€ 0,63
<b>C30P, C33P, C35P, C37P</b>	CAP-MKS-RM5	CapMKS	470pF	4	450534 - 89	€ 0,35	81.50.470P		<a href="#">1005988</a>	€ 0,28
<b>C29P, C31P, C32P, C34P, C36P, C38P, C41P, C27P</b>	CAP-MKS-RM5	CapMKS	1uF	8	450481 - 89	€ 0,84	81.40.1U.63		<a href="#">1006040</a>	€ 1,42
Or alternative:					450306 - 89	€ 1,23				
<b>C39P</b>	CAP-MKS-RM5	CapMKS	330nF	1	455423 - 89	€ 0,55	81.40.330N.63		<a href="#">1166040</a>	€ 0,28
<b>D9P, D10P, D1D, D2D, D3D, D4D</b>	DIO-RM4	Diode 1N4148		6	162280 - 89	€ 0,05	1.60.1N4148		<a href="#">9843680</a>	€ 0,01
<b>D1P, D2P, D3P, D4P, D5P, D6P, D7P, D8P</b>	DIO-RM4	Schottky rectifier MBR1100		8	163680 - 89	€ 0,15	01.60.STPS2H1		<a href="#">4897432</a>	€ 0,08
<b>L1D, L2D</b>	DIL10	7-segment CA, 'c' at pin 7		2	156389 - 89	€ 1,15	71.50.4801RD		<a href="#">1241271</a>	€ 1,38
		eg. KingBright SA39-11, Liteon LTS4801, Avago HDSP 315								
<b>J3D</b>	SIL2	Header 2, 0.1" pitch		1			05.58.202		<a href="#">1056394</a>	€ 0,23
Or alternative:					744018 - 89	€ 0,81	05.88.1336		<a href="#">588398</a>	€ 0,17
<b>J1P, J2P</b>	SIL4	Header 4, 0.1" pitch		2			05.58.204		<a href="#">588490</a>	€ 0,57
Or alternative:									<a href="#">588416</a>	€ 0,52

<b>J1D, J2D</b>	SIL5	Header 5, 0.1" pitch		2	741230 - 89	€ 1,54	05.58.205	<a href="#">588507</a>	€ 0,75
Or alternative:								<a href="#">588428</a>	€ 0,65
<b>Q3P, Q4P</b>	TO92	J310		2			01.40.J310	<a href="#">1017717</a>	€ 0,43
Or alternative:		BF256C (rotated footprint!)		2	157210 - 89	€ 0,83			
<b>L1P</b>	RM2.5	LED1		1	184376 - 89	€ 0,11	71.54.2014RD		
<b>U1L, U1R, U1P, U2P</b>	DIP8	LM4562		4	NA		NA	<a href="#">1559275</a>	
<b>U6P</b>	TO220-flat	L4940V5		1	156045 - 89	€ 1,67	01.00.4940.50	<a href="#">9756060</a>	€ 0,80
<b>U5P</b>	TO220-flat	LM7812CT		1	179230 - 89	€ 0,58	01.00.7812.80	<a href="#">9666109</a>	€ 0,53
<b>U1D, U2D</b>	DIP18	PIC16F819-I/P		2					
<b>R5D, R6D</b>	SIL8	Bourns 4608X-102-221	220R	2			51.76.220E	<a href="#">9356584</a>	€ 0,28
<b>J1L, J1R, J2L, J2R, J3L, J3R</b>	Cinch	Wire to chassis-connector		6					
<b>R1D, R15P, R28P, R30P, R8P, R27P</b>	AXIAL-0.4	Res1	100R	6	403920 - 89	€ 0,02	51.04.100E	<a href="#">9339043</a>	€ 0,02
<b>R1P, R20P, R24P, R9P</b>	AXIAL-0.4	Res1	150R	4	403946 - 89	€ 0,02	51.04.150E	<a href="#">9339175</a>	€ 0,02
<b>R12P, R16P, R19P, R31P, R6P, R11P, R14P, R21P, R3P</b>	AXIAL-0.4	Res1	1K (1%)	9	408166 - 89	€ 0,02	51.11.1K	<a href="#">9341102</a>	€ 0,03
<b>R10P, R17P, R23P, R26P, R2P</b>	AXIAL-0.4	Res1	1K5	5	404063 - 89	€ 0,02	51.04.1K5	<a href="#">9339183</a>	€ 0,02
<b>R22P, R4P</b>	AXIAL-0.4	Res1	330R	2	403989 - 89	€ 0,02	51.04.330E	<a href="#">9339418</a>	
<b>R18P, R25P, R29P, R5P</b>	AXIAL-0.4	Res1	3R3	4	404560 - 89	€ 0,02	51.04.3E3	<a href="#">9339450</a>	
<b>R13P, R2D, R3D, R4D, R7P</b>	AXIAL-0.4	Res1	5K6 (1%)	5	408255 - 89	€ 0,02	51.11.5K6	<a href="#">9342060</a>	€ 0,03
Note: audio-grade resistors below are in this table rounded to E12 series. For more accurate values see design document.									
<b>R16L, R16R, R17L, R17R, R18L, R18R, R34L, R34R</b>	AXIAL-0.7	Res2	22K	8	419729-8A	€ 0,17	51.14.22K	<a href="#">9340211</a>	€ 0,04
<b>R15L, R15R, R20L, R20R</b>	AXIAL-0.7	Res2	100R	4	419443-8A	€ 0,17	51.14.100E	<a href="#">9339760</a>	€ 0,04
<b>R1L, R1R, R19L, R19R</b>	AXIAL-0.7	Res2	150K	4	419826-8A	€ 0,17	51.14.150K	<a href="#">9340017</a>	€ 0,04
<b>R14L, R14R, R33L, R33R, R13L, R13R, R32L, R32R</b>	AXIAL-0.7	Res2	47K	8	419761-8A	€ 0,17	51.14.47K	<a href="#">9340637</a>	€ 0,04
<b>R21L, R21R, R2L, R2R</b>	AXIAL-0.7	Res2	390K	4	419877-8A	€ 0,17	51.14.390K	<a href="#">9340548</a>	€ 0,04
<b>R22L, R22R, R3L, R3R</b>	AXIAL-0.7	Res2	5K6	4	419656-8A	€ 0,17	51.14.5K6	<a href="#">9340734</a>	€ 0,04
<b>R23L, R23R, R4L, R4R</b>	AXIAL-0.7	Res2	180K	4	419834-8A	€ 0,17	51.14.180K	<a href="#">9340122</a>	€ 0,04
<b>R24L, R24R, R5L, R5R</b>	AXIAL-0.7	Res2	10K	4	419680-8A	€ 0,17	51.14.10K	<a href="#">9339787</a>	€ 0,04
<b>R25L, R25R, R6L, R6R</b>	AXIAL-0.7	Res2	82K	4	419796-8A	€ 0,17	51.14.82K	<a href="#">9340955</a>	€ 0,04
<b>R26L, R26R, R7L, R7R</b>	AXIAL-0.7	Res2	18K	4	419710-8A	€ 0,17	51.14.18K	<a href="#">9340114</a>	€ 0,04
<b>R27L, R27R, R8L, R8R</b>	AXIAL-0.7	Res2	33K	4	419745-8A	€ 0,17	51.14.33K	<a href="#">9340424</a>	€ 0,04
<b>R28L, R28R, R9L, R9R</b>	AXIAL-0.7	Res2	27K	4	419737-8A	€ 0,17	51.14.27K	<a href="#">9340327</a>	€ 0,04
<b>R29L, R29R, R10L, R10R</b>	AXIAL-0.7	Res2	8K2	4	419672-8A	€ 0,17	51.14.8K2	<a href="#">9340947</a>	€ 0,04
<b>R11L, R11R, R30L, R30R</b>	AXIAL-0.7	Res2	39K	4	419753-8A	€ 0,17	51.14.39K	<a href="#">9340530</a>	€ 0,04

<b>R12L, R12R, R31L, R31R</b>	AXIAL-0.7	Res2	1K2	4	419575-8A	€ 0,17	51.14.1K2	9339892	€ 0,04
<b>S1D</b>	RotarySwitch	Alps STEC11B03		1	700697 - 89	€ 5,70	03.49.770	1367413	€ 1,29
	Or: Piher ci-11	Or: DDM Hopt-Schuler 427			705594 - 89	€ 7,15			
	HQ non-print-mount:	Alps RK097-10ELC07							
<b>U3D</b>	SFH	Vishay TSOP4838		1	156406 - 89	€ 1,36	01.00.5110.38	4913190	€ 1,15
<b>U3P, U4P</b>	TO92	TL431ACLP		2	155635 - 89	€ 0,15		9593543	€ 0,29
		TL431CLP			155641 - 89	€ 0,15	01.00.431.51		
<b>K1, K2, K3, K4L, K4R, K5L, K5R, K6L, K6R, K7L, K7R, K8L, K8R, K9L, K9R, K10L, K10R, K11L, K11R, K12L, K12R, K13L, K13R</b>	DIL10	TQ2-12VDC		23	505036 - 89	€ 3,11	03.20.512'	1200949	€ 4,01
<b>U4D, U5D</b>	DIP16	ULN2003A		2	177970 - 89	€ 1,25	01.00.2003.90	1077215	€ 0,80
<b>J4L, J4R, J5L, J5R, J6L, J6R</b>	XLR Female	Neutrik NC3FAH1		6			05.03.383'	724518	€ 1,28
Or alternative:		Neutrik NC3FAAH-0						1310009	€ 0,56
<b>J7L, J7R</b>	XLR Male	Neutrik NC3MAH		2			05.03.483'	724543	€ 1,04
Or alternative:		Neutrik NC3MAAV-1						1310056	€ 0,63
Optional IC socket	8-pin DIL			4	189600 - 89	€ 0,29		1103844	€ 0,43
Optional IC socket	16-pin DIL			2	189626 - 89	€ 0,46		1103846	€ 0,72
Optional IC socket	18-pin DIL			2	189634 - 89	€ 0,52		1103847	€ 0,77
<b>Sum PCB components:</b>				238		€ 134,01			€ 148,72
						Inc. btw			ex.btw

**Miscellaneous options, not on PCB:**

<b>Trafo 2x18V</b>	(for an over-powered transformer, choose 2x15V)	506443 - 89	€ 5,45	02.04.15.15	<a href="#">9531610</a>	€ 9,60
<b>Trafo 2x7V</b>	(for an over-powered transformer, choose 2x6V)	506419 - 89	€ 5,45	02.04.15.6	<a href="#">9531572</a>	€ 12,86
<b>Neutrik Cableplug Male Gold</b>	Neutrik NC3MXXB	736989 - 89	€ 3,58	05.03.203G	<a href="#">9991816</a>	€ 3,17
<b>Neutrik Cableplug Female Gold</b>	Neutrik NC3FXXB	736951 - 8A	€ 4,09	05.03.103G	<a href="#">9991786</a>	€ 3,55
<b>XLR microphone cable</b>		302791 - 8A	€ 1,57	05.22.C208ZW	<a href="#">3855570</a>	€ 3,39
		603774 - 89	€ 15,34	05.22.C208RD		
<b>Cinch connector chassis Red</b>		731085 - 8A	€ 1,32	05.06.515RD.G	<a href="#">5008529</a>	€ 0,84
<b>Cinch connector chassis Black</b>		731071 - 8A	€ 1,32	05.06.515ZW.G	<a href="#">5008517</a>	€ 0,84
<b>Power switch relay (250V, 12A)</b>	Coil 12Vdc	504742 - 89	€ 5,62	03.02.5012'	<a href="#">9659234</a>	€ 2,15
<b>Red plexiglass window</b>		530700 - 89	€ 0,76			
<b>Resistor bending tool</b>		425869 - 89	€ 1,03			

Conrad is found at <http://conrad.com> and a set of per-country websites through Europe. Unfortunately, it seems that some country-sites only show a reduced set of articles.

Farnell is found at <http://www.farnell.com/>, also with a whole set of country-specific sites. Their website seems to discourage direct sales to private end-users, although they still support that for a properly sized order under advance payment.

Display is found at <http://www.display.nl>, and allows to order components through different shops in the Netherlands. I did not list prices, since the prices on the website are shop buying price and not end-user price.

Clearly, the TQ2 relays take a significant part of the component cost. It sometimes seems rewarding to look at alternative places, like [www.ebay.com](http://www.ebay.com) or [www.digikey.com](http://www.digikey.com)

Please regard this table only as helping guide for choosing your own components. I cannot take responsibility for the correctness of the shop component article numbers. The mentioned prices are to be considered as rough indication only, as these will change over time.

Note that the component selection in different shops results in different types. A direct shop price-level comparison from this table is not fair because of my personal preference to always choose the best quality components. Also, some (low cost) components might be only available at larger quantities, which is not accounted for in above table.

The PIC 16F819 microcontrollers need to be programmed with the firmware for this preamp design. Upon request I can send pre-programmed parts. I do not intend to make their firmware available.

**Success,**

**Jos van Eijndhoven**

**apr 15, 2009**