

Equinoxe Phaser Issue 1 - Page 1 of 3

Oakley Modular Systems

Documented by Tom Farrand • Radio-Flier Electronics • Updated August 20, 2002

Qty	Mfgr. Name	Manufacturer's Part Number	Part Description	Schematic Reference	Vendor	Vendor Stock #	Each	Total
11	Xicon	271-10K	10K ¼W 1% resistor 50 ppm	R1, R10, R17, R23, R27, R31, R35, R50, R52, R54, R56	Mouser	271-10K	0.09	0.99
10	Xicon	271-100K	100K ¼W 1% resistor 50 ppm	R5, R8, R19, R44, R46, R47, R49, R51, R53, R55	Mouser	271-100K	0.09	0.90
8	Xicon	271-27K	27K ¼W 1% resistor 50 ppm	R15, R21, R24, R25, R28, R29, R32, R33	Mouser	271-27K	0.09	0.72
7	Xicon	271-1K	1K ¼W 1% resistor 50 ppm	R22, R26, R30, R34, R39, R43, R59	Mouser	271-1K	0.09	0.63
4	Xicon	271-22	22Ω ¼W 1% resistor 50 ppm	R41, R42, R57, R58	Mouser	271-22	0.09	0.36
3	Xicon	271-4.7K	4.7K ¼W 1% resistor 50 ppm	R12, R14, R18	Mouser	271-4.7K	0.09	0.27
2	Xicon	271-30K	30K ¼W 1% resistor 50 ppm	R16, R20	Mouser	271-30K	0.09	0.18
2	Xicon	271-470K	470K ¼W 1% resistor 50 ppm	R13, R36	Mouser	271-470K	0.09	0.18
2	Xicon	271-56K	56K ¼W 1% resistor 50 ppm	R11, R40	Mouser	271-56K	0.09	0.18
1	Xicon	271-100	100Ω ¼W 1% resistor 50 ppm	R6	Mouser	271-100	0.09	0.09
1	Xicon	271-15K	15K ¼W 1% resistor 50 ppm	R3	Mouser	271-15K	0.09	0.09
1	Xicon	271-22K	22K ¼W 1% resistor 50 ppm	R4	Mouser	271-22K	0.09	0.09
1	Xicon	271-270K	270K ¼W 1% resistor 50 ppm	R60	Mouser	271-270K	0.09	0.09
1	Xicon	271-2.2K	2.2K ¼W 1% resistor 50 ppm	R7	Mouser	271-2.2K	0.09	0.09
1	Xicon	271-47	47Ω ¼W 1% resistor 50 ppm	R2	Mouser	271-47	0.09	0.09
1	Xicon	271-330K	330K ¼W 1% resistor 50 ppm	R45	Mouser	271-330K	0.09	0.09
1	Xicon	271-47K	47K ¼W 1% resistor 50 ppm	R37	Mouser	271-47K	0.09	0.09
1	Xicon	271-6.8K	6.8K ¼W 1% resistor 50 ppm	R9	Mouser	271-6.8K	0.09	0.09
1	Xicon	271-7.5K	7.5K ¼W 1% resistor 50 ppm	R38	Mouser	271-7.5K	0.09	0.09
1	Xicon	271-82K	82K ¼W 1% resistor 50 ppm	R48	Mouser	271-82K	0.09	0.09
1	Piher	PTC10V-500K	500K 10mm Cermet trimpot ¹	“Tune”	Mouser	531-PTC10V-500K	0.45	0.45
1	Piher	PTC10V-50K	* 50K 10mm Cermet trimpot	“Tune”	Mouser	531-PTC10V-50K	0.45	0.45

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Qty	Mfgr. Name	Manufacturer's Part Number	Part Description	Schematic Reference	Vendor	Vendor Stock #	Each	Total
1	Omeg	BR16ECO-10KB	10K log pot w/bracket	"Emphasis"	OMS	Equinox Pot Kit	2.25	2.25
2	Omeg	BR16ECO-47KA	47K linear pot w/bracket	"Freq", "Depth"	OMS	Equinox Pot Kit	2.25	4.50
1	Omeg	BR16ECO-47KB	47K log pot w/bracket	"Rate"	OMS	Equinox Pot Kit	2.25	2.25
						Pot kit (£ 6.00)	9.00	
8	Panasonic	EEU-FC1V220	22 uf 35V FC-series electrolytic capacitor ²	C1, C5, C7, C8, C12, C13, C14, C15	Digikey	P11230-ND	0.46	3.68
5	Vishay	MKT1826410064	0.1 uf @ 63V polyester film 5% capacitor	C2, C4, C11, C20, C21	Mouser	75-MKT1826410064	0.21	1.05
4	Vishay	MKT1826447064	0.47 uf @ 63V polyester film 5% capacitor	C3, C6, C9, C10	Mouser	75-MKT1826447064	0.64	2.56
4	Vishay	KP1830268064	6800 pf polypropylene 5%	C16, C17, C18, C19	Mouser	75-KP1830268064	0.81	3.24
10	Fairchild	BC550C or 2N3904	BC550C NPN low noise transistor (2N3904) ³	Q1, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11	Mouser	512-BC550C or 512-2N3904	0.07 0.11	0.70 1.10
2	Fairchild	BC560C or 2N3906	BC560C PNP low noise transistor (2N3906) ³	Q2, Q12	Mouser	512-BC560C or 512-2N3906	0.07 0.08	0.14 0.16
4	Intersil	CA3080E	CA3080E OTA 8-pin DIP	U2, U3, U4, U5	Mouser	570-CA3080E	0.68	2.72
2	T.I.	TL072ACP	TL072 dual opamp 8-pin DIP	U1, U6	Mouser	595-TL072ACP	0.74	1.48
1	Lumex	*	Bi-color MOTM style LED ⁴	LED	SynthTech	(Contact Paul S.)	7.50	7.50
4	Switchcraft	112A	¼" phone jack with closed circuit	IN, OUT, LFO, CV	Mouser	502-112A	1.44	5.76
2	Fair-Rite	2743002112	Ferrite Bead – broadband #43 material	L1, L2	Mouser	623-2743002112	0.12	0.24
1	Molex	MTA-156	MTA-156 power entry	PWR	Mouser	571-6404454	0.11	0.11
3'	Belden	8216	Coaxial audio cable ⁵	(IN, OUT, LFO, CV)	Mouser	566-8216-100	0.36	1.08
4	Tyco/Alco	PKES-90B-1/4	Knob with pointer stripe ⁶	("Emphasis, Freq, Depth, Rate")	Various	-	1.50	6.00

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Notes:

- 1 The Piher trimpot is specified by Oakley with a value 500K. I would personally go for a 50K or 100K part to make the tune voltage a wee bit stiffer. 50K is also a value that is popular in other Oakley products (I think), so making a quantity purchase of one value would be a sensible thing to do if the builder is making more Oakley modules than just an Equinox Phaser. A Cermet part is also specified, whereas Oakley specifies carbon composition. There is only a \$0.09 difference between the carbon composition pots and the better Cermet variety.
- 2 The Panasonic capacitor specified is much more expensive than those commonly used and specified elsewhere. In fact, these are about ten times more expensive! The capacitors I specified are low-ESR types with a high temperature rating, a higher voltage rating, and probably a lot longer life. By the way, the PC board is laid out for a capacitor lead spacing of 5 mm. All of the capacitors I could find in that value had an actual lead spacing of 2.0 mm. So fitting the caps to the board will require a bit of lead bending to make them fit properly.
- 3 2N3904 and 2N3906 transistors may be substituted for the BC550 and BC560 transistors, respectively. Note: The 2N390x parts use a different pinout than the BC5x0 counterparts. When looking at the flat side of a **2N390x** and the leads point down, the pins (left-to-right) are **E-B-C**. When looking at the flat side of a **BC5x0** and the leads point down, the pins (left-to-right) are **C-B-E**. Install the transistor you buy accordingly!
- 4 The LED is a special case. Lumex has never offered a bi-color LED in the form factor chosen by Synthesis Technology as “standard” on MOTM modules. I believe that Paul had to special order a run of these LEDs and paid a small fortune for his trouble. If you really want the Equinox Phaser to maintain the MOTM look, you’ll have to pony up with something like \$7.50 for each of the bi-color LEDs and obtain them from Paul. If you are not a purist, most any bi-color LED will work.
- 5 The coaxial cable used is Belden 8216 and is commonly known by its military number RG174/U. The part number specified is for a 100-foot roll of that cable. Therefore, the per-foot price is based on buying a 100’ roll. I’d probably scrounge up some coax cable rather than pop for a 100’ roll unless you plan on building a whole lot of modules.
- 6 The PKES-90B-1/4 knob is manufactured by Alco, a subsidiary of Tyco. Tyco seems to have jacked up the prices substantially on this knob. You are advised to shop around for the best deal on these knobs and buy a bunch of them.

The total component parts cost is \$51.11 but does not reflect savings obtained through quantity buys. The prices stated were in effect at the time this document was written.

Digikey = www.digikey.com

Mouser = www.mouser.com

OMS = www.oakleysound.com

SynthTech = www.synthtech.com

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