
easy69 Documentation

Release 0.1

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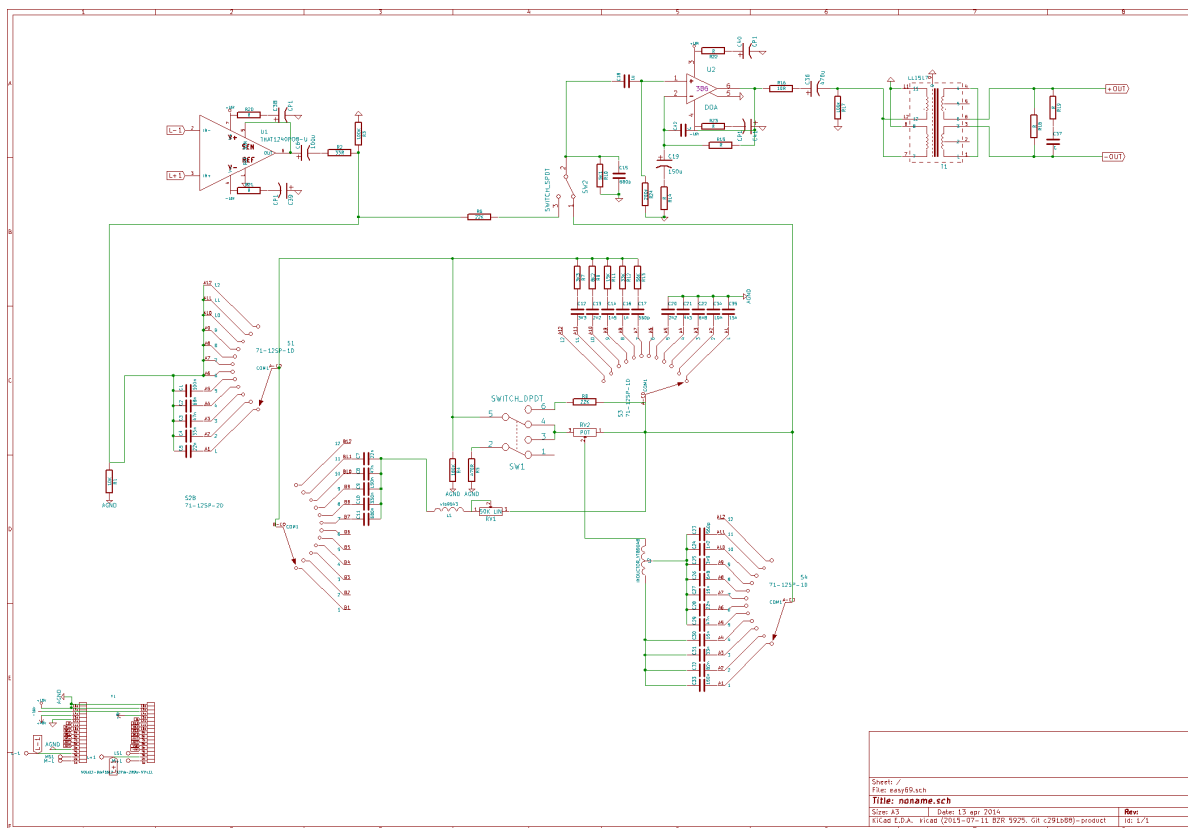
Easy 69 is a 3-band inductor based EQ based on the classic Helios type 69. It is aimed as a relatively simple build with easy-to-find parts.

Contents:

CHAPTER 1

Schematic

Below is the schematic for the Easy69 module and also the backplane connections for the Helvellyn backplane/motherboard



CHAPTER 2

Bill Of Materials

2.1 Capacitors

Value	Quantity	Ref	Link	Note
560p	2	C17 C23	Farnell	
680p	1	C15	Farnell	
1n	1	C16		
1n2	1	C24	Farnell Mouser	Alternately use pll combination of 680p and 560p
1n5	1	C14	Farnell	
2n2	2	C13 C20	Farnell	
3n3	1	C12	Farnell	
3n9	1	C25	Mouser	Alternately use 3.98 = pll combination of 3n3 and 680pf
4n3	1	C21	Mouser	Can also use 4n7 farnell #: 1890183 1890183
6n8	2	C22 C26	Farnell	
10n	1	C34	Farnell	
15n	3	C27 C30 C35	Farnell	
22n	3	C5 C7 C28	Farnell	
33n	2	C4 C31	Farnell	
47n	3	C3 C8 C29	Farnell	
68n	1	C2	Farnell	
82n	1	C32	Farnell	
100n	1	C1	Farnell	
150n	2	C9 C33	Farnell	
330n	1	C10	Farnell	
680n	1	C11	Farnell	
1u	1	C18	Farnell	
100u	1	C6	Farnell	
150u	1	C19	Farnell	
TBD	2	C37 C42		
470u	1	C36	Farnell	
6330u	4	C38 C39 C40 C41	Farnell	Chapter 2. Bill Of Materials

2.2 Resistors

Value	Quantity	Ref	Link	Note	
10R	1	R16	Farnell		
33R	1	R2	Farnell		
470R	1	R5	Farnell		
3K3	1	R7	Farnell		
5K1	1	R10	Farnell		
8K2	1	R9	Farnell		
10K	1	R1	Farnell	9341110	
15K	1	R11	Farnell		
22K	2	R6 R8	Farnell		
33K	1	R12	Farnell		
56K	1	R13	Farnell		
100K	1	R3 R17	Farnell		
180K	1	R4	Farnell		
200k	1	R24	Farnell		
TBD	8	R14 R15 R18 R19 R20 R21 R22 R23			

2.3 Potentiometers/Switches

Value	Quantity	Ref	Link	Note
50K	LIN 1	RV1	1517306	
25K	Lin 1	RV2	8557586	
71-12SP-1D	3	S1 S3 S4		
71-12SP-2D	1	S2		
SWITCH_DPDT	1	SW1	9473394	
SWITCH_SPDT	1	SW2	9473378	

2.4 Transformers/Inductors

Value	Quantity	Ref	Link	Note
Carnhill VTB9043	1	L1		Available from audiomaintenance
Carnhill VTB9048	1	L2		Available from audiomaintenance
LL1517	1	T1		

2.5 Opamps

Value	Quantity	Ref	Link	Note
THAT1240PO8-U	1	U1	1354147	
DOA	1	U2		

2.6 Connectors

Value	Quantity	Ref	Link	Note
Male DIN41612	1	1656157		
Female DIN41612	1	1656165		

Before starting anything, you should familiarise yourself with the schematics and board layout. There are various choices to make when gathering components, such as which transformer and opamp to use. This decision will affect the value of some resistors and capacitors.

3.1 Opamps

The resistors R15 and R14 set the makeup gain for the opamp. The easy69 has approximately a 15dB insertion loss. Therefore R15 and R14 should be scaled such that

$$20\log(1 + R15/R14) = 15$$

An example value would be $R15 = 25K$ and $R14 = 5K$. These are good values to choose for 2520-style opamps. There are of course numerous combinations of R14 and R15 that will give the correct gain and the best values to choose depends upon the opamp. Usually the manufacturer/designer should be able to give you some kind of indication as to a good pairing.

C42 is a compensation cap, usually in the range 10 - 500pf. Some opamps already include a compensation cap, so you should check the datasheet as to whether this is necessary.

3.2 Transformers

Easy69 can take a Lundahl LL1517, Cinemag XXXX or Edcor XXXX transformer. The resistor and capacitor XXXX form a zobel network which is required to dampen 'ringing' in a transformer. The correct values are dependent on the transformer and can usually be found via the datasheet or from the manufacturer.

Capacitor ranges: Panasonic ECQE(F) ECQV(?) ECQE(B)