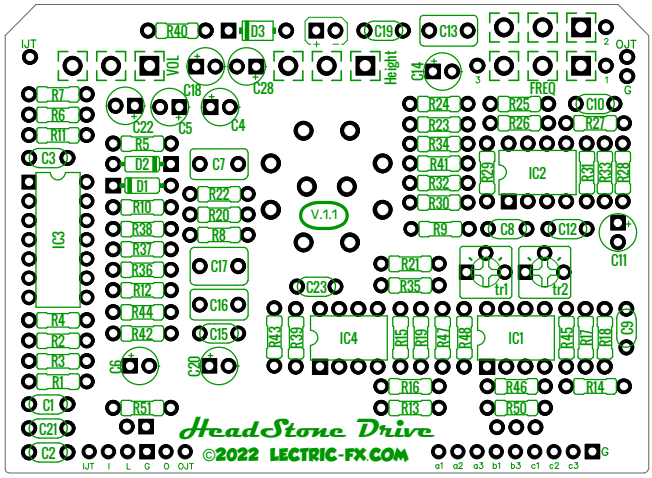
HeadStone Drive

V.1.1

Lectric-fx 2022

Based on the Maestro MPF-1



A MOSFET/CMOS based clean boost, overdrive & powerful (semi) parametric EQ all in one, famously used by QOTSA & Rush, the Maestro™ MPF-1 offers a wide array of tone shaping options and fuzz sounds.

With the Headstone, we've added a few handy new features, the 'natural' (clean) and overdrive channels are now independently selected via foot switch (with dual colour indicator LED), a 4th 'Q' selection is added via the rotary control and a clean output boost with master volume control is included.

We will be including 2 x 3pdt boards for the footswitches, along with ribbon cables to connect them to the main board.

Notes:

Height Pot (EQ Boost/Cut)The original MPF-1 calls for an S-taper 10k pot (also known as W-taper) to provide a smooth action without 'bunching at the extremes' on the height pot, if you can't source this and are happy with a little bunching, a standard B10k pot is recommended.

The older V.1.0 of this project had spots for parts R46 & 49, that were included as tapering resistors to help fake an S-taper with a linear Height pot. That solution didn’t work well in this circuit, so we have removed them for V.1.1.

New for V.1.1:

R46 & R50 are each CLR’s for the bi-color LED, so that custom values can control the brightness of both red and green colors. The suggested values in the BOM are just suggestions; YMMV.

Extra pads were added to the FREQ pot for experimentation with an external expression pedal.

Trimmers

Two trimmers are provided on board, some find the MPF-1 has a slight volume drop in the overdrive mode so to remedy this we have added a clean op amp output boost, these two trimmers set the gain for both 'natural' (clean) and overdrive mode and allow matching of the two signal levels on the foot switch, or even a boost if you prefer.

Rotary 'Q' Bandwidth

The MPF-1 offered 3-EQ 'Q' Bandwidth settings via its rotary, here we've used a mini 4 position rotary which has allowed us to add a new 'in-between' mode which can either be set between the original med-sharp (1) or broad-med (2) modes with a few component changes.

(1) R20 - 180R, R22 - 150R, R23 -330R, R30 - 20k, R41 - 10k.

(2) R20 - 330R, R22 - 180R, R23 - 150R, R30 - 47k, R41 - 20k.

Op Amp Choice

As with most of this Maestro™ range, the circuit was designed with batteries in mind and as such, used a low current op-amp (TL022) to preserve power but as this is less of a consideration for most modern users, to reduce noise in the EQ section, the usual suspects (TL072, NE5532 etc.) can be employed in IC1.

IC2 is not directly in the audio path and should remain a TL022 or other lower current type (TL062, RC4558 etc.).

B.O.M.

RESISTORS	
R1	4M7
R2	3M3
R3	2M2
R4	33k
R5	33k
R6	2M2
R7	4M7
R8	22k
R9	5k6
R10	2k2
R11	10k
R12	10k
R13	1M
R14	1M
R15	2M2
R16	2M2
R17	10k
R18	1k
R19	2k
R20	180R
R21	2k
R22	150R
R23	330R
R24	3k3
R25	22k
R26	15k
R27	22k
R28	22k
R29	43k
R30	20k
R31	1k6
R32	1M
R33	1k6
R34	4k7
R35	10k
R36	100k
R37	110k
R38	10k
R39	100k
R40	33R
R41	10k
R42	100k
R43	22k
R44	1k
R45	220k
R46	2k2**
R47	5k6
R48	5k6
R50	4k7**
R51	4k7
** CLRs for Bicolor LED	
CAPS	
C1	22n
C2	470p
C3	22n
C4	2u2
C5	2u2
C6	2u2
C7	220n
C8	100n
C9	15n
C10	100p
C11	10u
C12	1n2
C13	390n
C14	10u
C15	10n
C16	220n
C17	1u film
C18	10u
C19	10n
C20	2u2
C21	33p
C22	2u2
C23	33p
C28	47u
DIODES	
D1	1n4148
D2	1n4148
D3	1n5817
Indicator	LED
Indicator	Bi-color LED
IC's	
IC1	TL022
IC2	TL022
IC3	CD4007UBE
IC4	TL071
SWITCHES	
2P4T	Mini Rotary
Clean/Drive	3PDT
Bypass	3PDT
TRIMMERS	
tr1	50k
tr2	50k
POTS	
VOL	100KA
FREQ	100KC DUAL GANG
Height	10KS *

* See notes on page 1.

QTY's

RESISTORS	
1	33R
1	150R
1	180R
1	330R
2	1k
2	1k6
2	2k
2	2k2
1	3k3
3	4k7
3	5k6
6	10k
1	15k
1	20k
5	22k
2	33k
1	43k
3	100k
1	110k
1	220k
3	1M
4	2M2
1	3M3
2	4M7

CAPS	
2	33p
1	100p
1	470p
1	1n2
2	10n
1	15n
2	22n
1	100n
2	220n
1	390n
1	1u film
5	2u2
3	10u
1	47u
DIODES	
2	1n4148
1	1n5817
1	Indicator LED
1	Bi-color LED
SWITCH	
1	2P4T Mini Rotary
VARIABLE RESISTORS	
2	50k tr
1	100KA
1	100KC Dual G
1	10KS or 10KB

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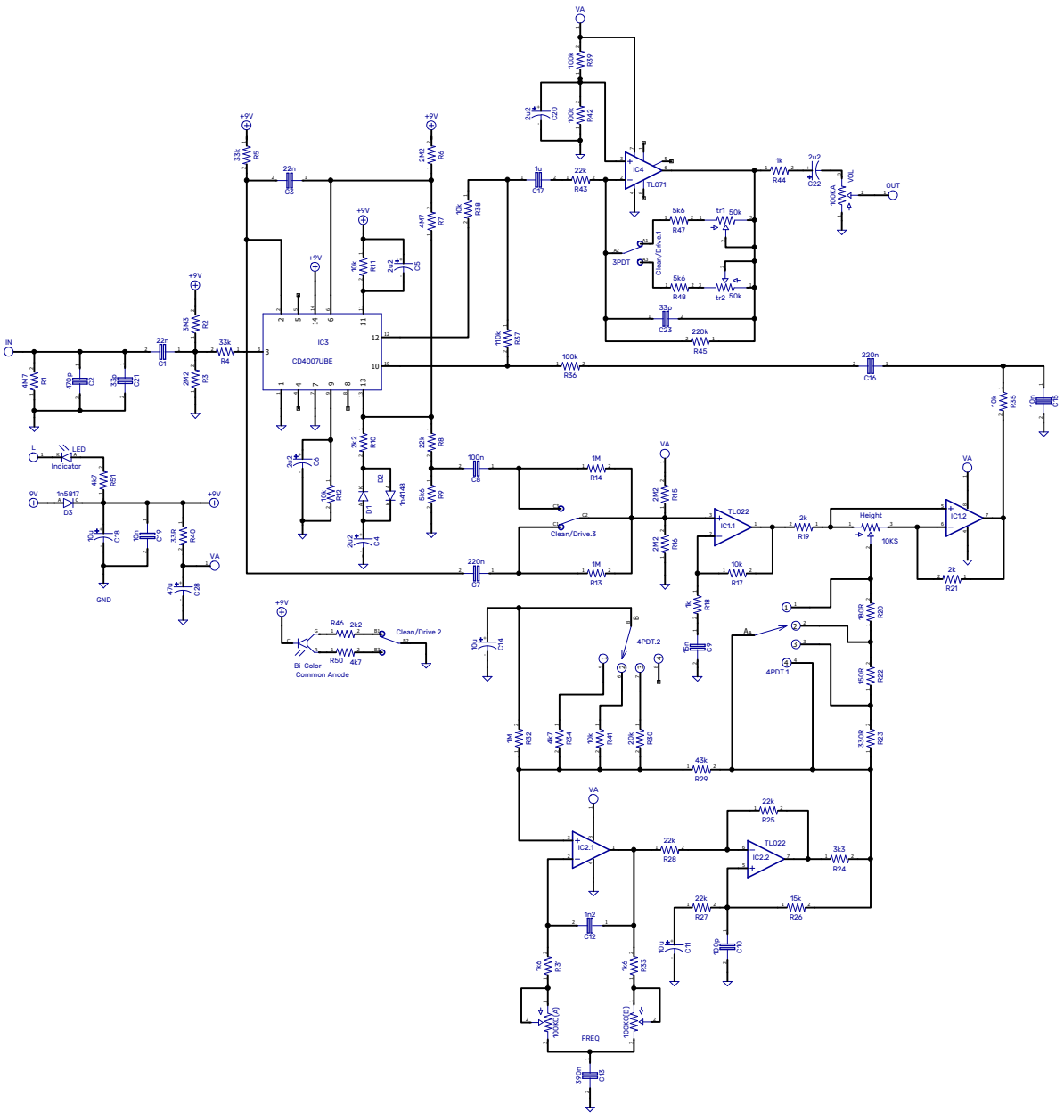
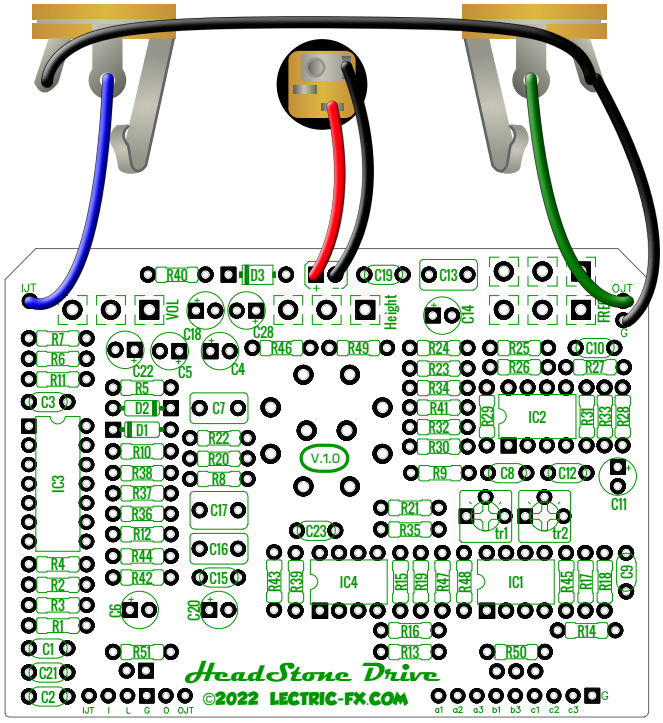
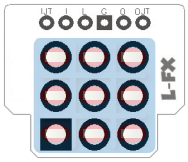
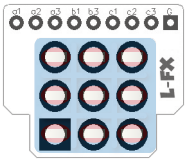


WIRING SUGGESTION







Carefully trim one wire off the provided 10-conductor ribbon cable. Then just connect the small pcb's you've soldered to your 2 x 3PDT footswitches straight across to the main pcb with the 6-conductor and 9-conductor cables.

DRILL TEMPLATE