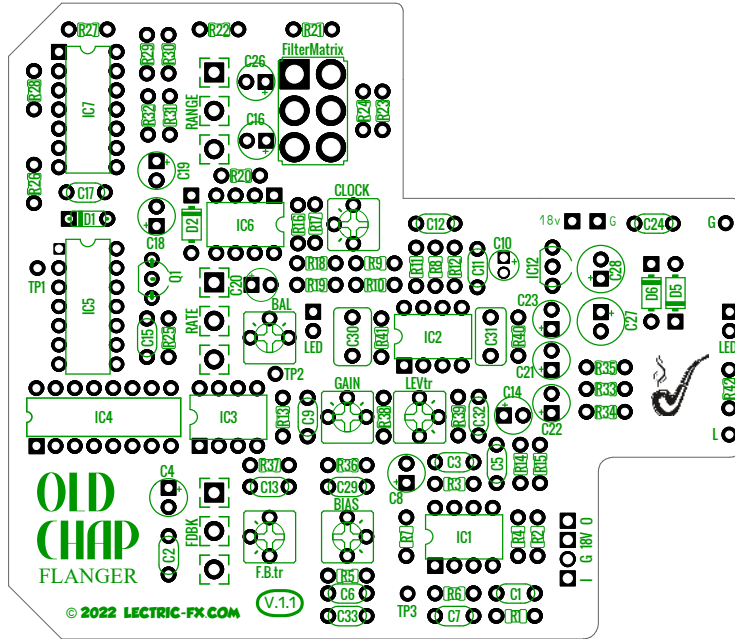


# OLD CHAP

## V.1.1 FLANGER

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Based on the EHX Deluxe Electric Mistress™



The vintage Deluxe Electric Mistress was the big brother to the standard 9 & 18V mistress circuits, while they share the same parentage (and LFO, VCO & Clock circuitry!) the Deluxe had a completely redesigned audio path giving the circuit a different flavour sound and was also run at 15V, providing more headroom and a much bigger sweep, no longer just the more chorus-like flanger sounds of the originals but not quite a jet plane, it straddles somewhere in-between. This should not be confused with the modern Deluxe Electric Mistress (90's onwards) which was more like a redesigned 9V variant and run @ 12V.

Lectric FX's take, the Old Chap, simply replaces the unobtainable SAD1024 of the original with an MN3007 and necessary clock buffer chip, adds a clean op amp output boost to prevent any signal loss, some power filtering to help keep things quiet and a handy new rate indicator.

This circuit is recommended to be run at 18V only, as even with an external charge pump board you will very likely get heterodyning noise.

Set up procedure:

You will need some way of measuring clock frequency and an audio probe.

Put all trims @ 50%

- Set rate & feedback CCW, Range CW and set to filter matrix mode (clock frequencies will be stationary in FM mode)
- Probe TP-1 (using the frequency setting of your multimeter or an oscilloscope) and adjust clock trim for 70kHz.
- Break out your audio probe and probe TP-2, then while playing through the pedal, adjust bias trim until signal passes and further tweak for the least amount of distortion.
- Now switch your audio probe between TP-2 & TP-3 and adjust gain trim so that TP-2 has an equal signal level to TP-3.
- Due to the doubled clock frequency, the balance trim isn't all that easy to set up without a scope and can simply left set at 50% with little impact, however, if you wish to get the very best out of the circuit, drop the clock frequency down to 17.5kHz, remove the signal source from the pedals input and probe TP-2, adjust the balance trim for the least amount of whine (don't forget to put the clock back to 70kHz after doing this!).
- Play through the pedal as normal (but make sure you turn your amp level down to start with as things are about to oscillate!) put feedback full CW and adjust the feedback trim until just before the point of oscillation.
- Finally, adjust the level trim to match the bypass level.

As with many vintage EHX circuits, the DEM went through a few variations in its lifetime, all of which can be built on this board:

Rev - A: Omit C3, C26, Install R23 & C17 - More high end, LFO smooths off with range control. (C2 was missing on some early versions but I wouldn't recommend this as it may lead to untameable feedback).

Rev - C: (Green) Omit R23 & C17 - Most common unit, LFO smooths off with rate.

Rev - D: Omit R23 & C17, R5 = 150k, R11 = 22k - Late units, more upper mids @5kHz but with less gradual high roll off and LFO smooths off with rate.

If building Revisions C or D, the empty R23 needs a jumper.

## B.O.M.

<b>1/8W RESISTORS</b>	
R1	180k
R2	390k
R3	390k
R4	100k
R5	240k
R6	100k
R7	100k
R8	160k
R9	160k
R10	100k
R11	68k
R12	100k
R13	68k
R14	47k
R15	150R
R16	2k7
R17	3k9
R18	62k
R19	1M2
R20	33k
R21	47k
R22	47k
R23	10k
R24	27k
R25	3k9
R26	30k
R27	10k
R28	39k
R29	24k
R30	8k2
R31	4k7
R32	4k7
R33	22R
R34	22R

R35	22R
R36	6k8
R37	100k
R38	47k
R39	47k
R40	100k
R41	100k
R42	4k7 (CLR)
<b>CAPS</b>	
C1	27n
C2	1n
C3	22p
C4	33u
C5	68n
C6	470p
C7	56p
C8	1u electro
C9	100n
C10	1u electro
C11	180p
C12	1n
C13	33n
C14	4u7
C15	22p
C16	1u electro
C17	220n
C18	33u
C19	33u
C20	1uF Tant
C21	47u
C22	47u
C23	47u
C24	100n ceramic
C26	1u electro
C27	220u

C28	220u
C29	100n
C30	1uF film
C31	330n
C32	10p
C33	27p
<b>DIODES</b>	
D1	1N4148
D2	1n4001
D5	1n5817
D6	1n5817
<b>TRANSISTORS</b>	
Q1	2N5087
<b>IC's</b>	
IC1	JRC4558
IC2	JRC4558
IC3	MN3007
IC4	CD4049UBE
IC5	CD4013BE
IC6	LM311
IC7	LM324
IC12	78L15
<b>SWITCHES</b>	
Filter Matrix	DPDT
<b>POTS</b>	
RANGE	100KB
RATE	1MC
FEEDBACK	10KB
<b>TRIMMERS</b>	
CLOCK tr	100k
F.B. tr	100k
GAIN tr	100k
LEV tr	100k
BIAS tr	20k
BAL tr	5k

## QTY's

<b>1/8W RESISTORS</b>	
3	22R
1	150R
1	2k7
2	3k9
3	4k7
1	6k8
1	8k2
2	10k
1	24k
1	27k
1	30k
1	33k
1	39k
5	47k
1	62k
2	68k
8	100k
2	160k
1	180k
1	240k
2	390k
1	1M2

<b>CAPS</b>	
1	10p
2	22p
1	27p
1	56p
1	180p
1	470p
2	1n
1	27n
1	33n
1	68n
2	100n
1	100n ceramic
1	220n
1	330n
1	1uF film
4	1uF electro
1	1uF tant *
1	4u7
3	33u
3	47u
3	220u

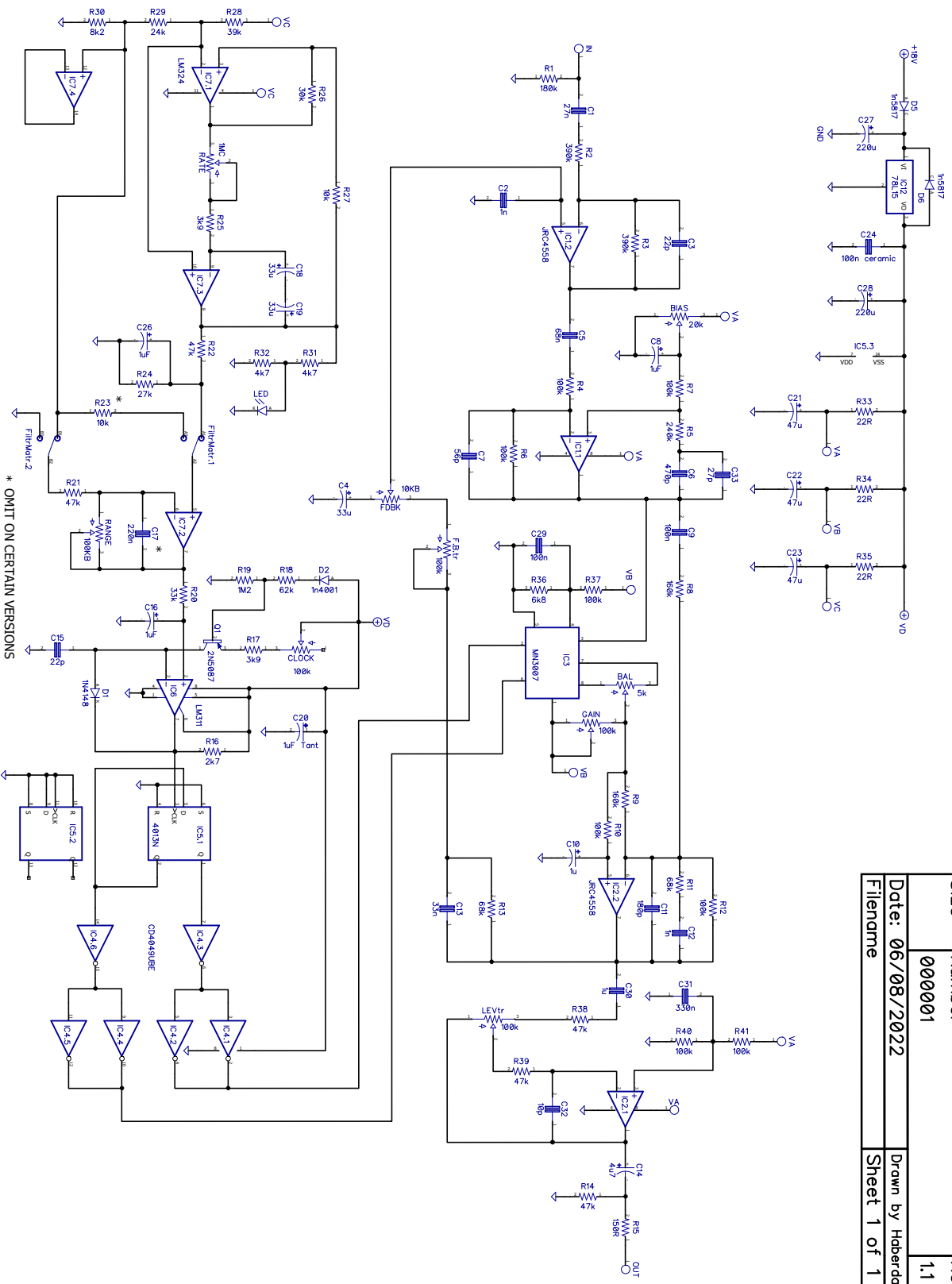
\* Please use a quality tantalum part for C20!

<b>DIODES</b>	
1	1N4148
1	1n4001
2	1n5817
<b>TRANSISTORS</b>	
1	2N5087
<b>IC's</b>	
2	JRC4558
1	MN3007
1	CD4049UBE
1	CD4013BE
1	LM311
1	LM324
1	78L15
<b>SWITCH</b>	
1	DPDT ON/ON
<b>POTS</b>	
1	100KB
1	1MC
1	10KB
<b>TRIMMERS</b>	
1	5k tr
1	20k tr
4	100k tr

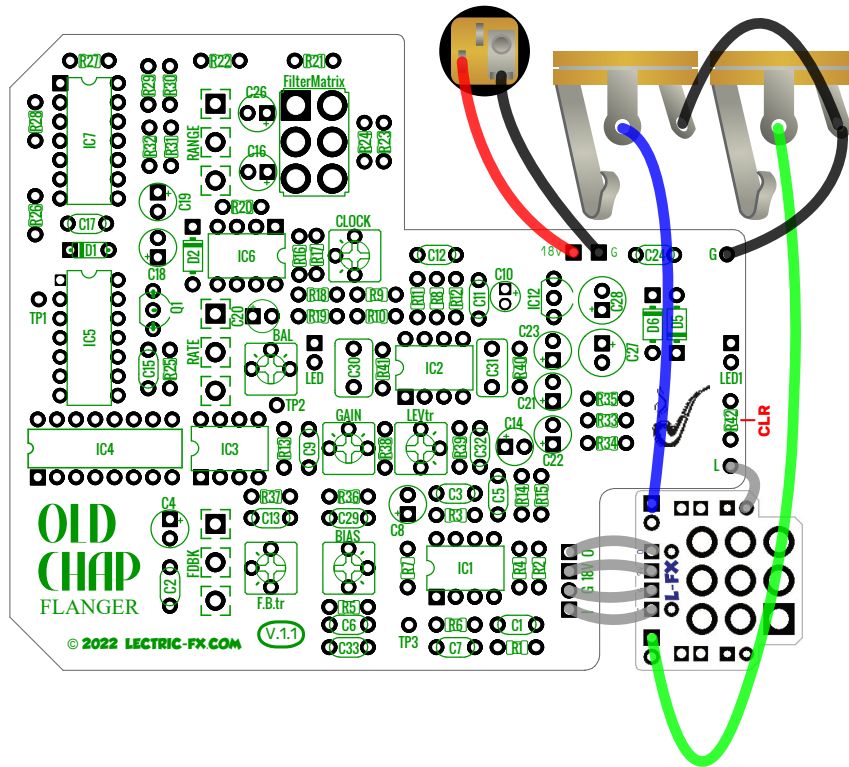
Title: Old Chap Flanger

Size	Number	Rev
	000001	1.1

Date: 06/08/2022  
 Drawn by Heberdsdsher  
 Filename Sheet 1 of 1



# WIRING



# DRILL TEMPLATE

