MOBIUS STRIP™

FX TYPE: Dual Delay
Images © VFE and MBP
Project Doc © madbeanpedals

2.17" W x 2.025" H

(PCB layout diagram)

2.5mm caps
2 x 22p
2 x 220p
6 x 0.1u
2 x 0.1u film

5mm caps
4 x 2.7n
2 x 4.7n
2 x 15n
2 x 33n
4 x 82n
(2.5mm width)
2 x 82n
(fold legs 90º)
3 x .22u
1 x .47u

Board labels: 4.7n, DPDT on-on, 15n, 0.1u, VFE Pedals, 10K, 2.7n, 82n, 0.1u, 47u, A100K, 22K, 0.1u, Mobius Strip v1.1, B50K, 100K, 220p, TLE2074, OMIT, 78L05, 15n, 33n, .22u, 22p, 0.1u, 22p, 47u, 4.7n, B50K, 1K, 470, 100K, 82n, 220K, 390K, 1K, 100K, 15K, 47u, 100K, B50K, A, F, ED, DGD, 9V, AGD, V-, V+, B, 82n

Axial parts
2 x 470
5 x 1K
14 x 10K
1 x 15K
2 x 22K
5 x 100K
1 x 220K
1 x 390K

Other
1 x TLE2074
2 x PT2399
(w/ socket strips)
1 x 78L05
2 x 1u
4 x 47u 10V
(4mm diameter)

Note: Use the values listed on the image above – not the values indicated on the silk-screen of the PCB. Some values changed over time in the VFE product cycles.

REMINDER: PETER RUTTER / VFE DOES NOT PROVIDE SUPPORT FOR THESE PROJECTS. PLEASE DO NOT CONTACT HIM FOR QUESTIONS OR TECHNICAL SUPPORT. VISIT THE VFE SECTION OF THE MADBEANPEDALS FORUM FOR QUESTIONS AND ANSWERS!

		Shopping List		
QTY	Value	Type	Rating	Spacing
2	470R	Carbon / Metal Film	1/8W	
5	1k	Carbon / Metal Film	1/8W	
14	10k	Carbon / Metal Film	1/8W	
1	15k	Carbon / Metal Film	1/8W	
2	22k	Carbon / Metal Film	1/8W	
5	100k	Carbon / Metal Film	1/8W	
1	220k	Carbon / Metal Film	1/8W	
1	390k	Carbon / Metal Film	1/8W	
2	22pF	MLCC	~25v min	2.5mm
2	220pF	MLCC	~25v min	2.5mm
6	100n	MLCC	~25v min	2.5mm
2	100n	Film	~25v min	2.5 or 5mm
4	2n7	Film	~25v min	5mm
2	4n7	Film	~25v min	5mm
2	15n	Film	~25v min	5mm
2	33n	Film	~25v min	5mm
6	82n	Film	~25v min	5mm
3	220n	Film	~25v min	5mm
1	470n	Film	~25v min	5mm
2	1uF	Electrolytic or Tantalum	~25v min	2.5mm
2	47uF	Electrolytic	~16v min.	2.5mm
1	TLE2074			
2	PT2399			
1	LM78L05			
32	SIL	Single In-Line Sockets		
1	DPDT	On/On Solder Lug		
1	100kA	PC Mount Right Angle	16mm	
2	50kB	PC Mount Right Angle	16mm	
2	50kB	PC Mount / Plastic Shaft	9mm	

This list is for the audio board only. See the v.2 Switching Board doc for the parts needed for the switching system.
This effect does use a split-rail power supply so you will need to build the Switching Board with the charge pump.

2.5mm caps:

22pF (MLCC):
http://www.mouser.com/Search/ProductDetail.aspx?R=C315C220J5G5TAvirtualkey64600000virtualkey80-C315C220J5G

220pF (MLCC):
http://www.mouser.com/ProductDetail/KEMET/C320C221J2G5TA/?qs=sGAEpiMZZMt3KoXD5rJ2N%252bwgBl1a522xefKl%252bxFregl%3d

100n (MLCC): http://www.mouser.com/Search/ProductDetail.aspx?R=C320C104K5R5TAvirtualkey64600000virtualkey80-C320C104K5R

100n (Film):
https://www.mouser.com/ProductDetail/WIMA/MKS0C031000C00KSSD?qs=sGAEpiMZZMv1cc3ydrPrF2Av7JKdyW4DHocj5fU6Keg%3d

5mm caps:
470n (Film):
https://www.mouser.com/ProductDetail/KEMET/R82DC3470Z360J/?qs=sGAEpiMZZMv1cc3ydrPrF0%2fKYujtVgoK1HnXG0zURSM%3d

Polarized Caps:
1uF Mini Electrolytic:
https://www.mouser.com/ProductDetail/Nichicon/UMT1H010MCD2?qs=sGAEpiMZZMtZ1n0r9vR22X8XFWgFP6BCv3PBsTyCHb8%3d

1uF Tantalum:
https://www.mouser.com/ProductDetail/AVX/TAP105K025SCS?qs=sGAEpiMZZMtZ1n0r9vR22X84dCiTW0Oj1l9CM1XZS28%3d

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TLE2074:
https://www.mouser.com/ProductDetail/Texas-Instruments/TLE2074CN/?qs=sGAEpiMZZMtCHixnSjNA6CumnoLUElGjtkQTPuP%252bT7A%3d

9mm Plastic Shaft, PC Mount (50kB):
http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount-w-knurled-plastic-shaft/

16mm Right Angle, PC Mount (50kB, 100kA):
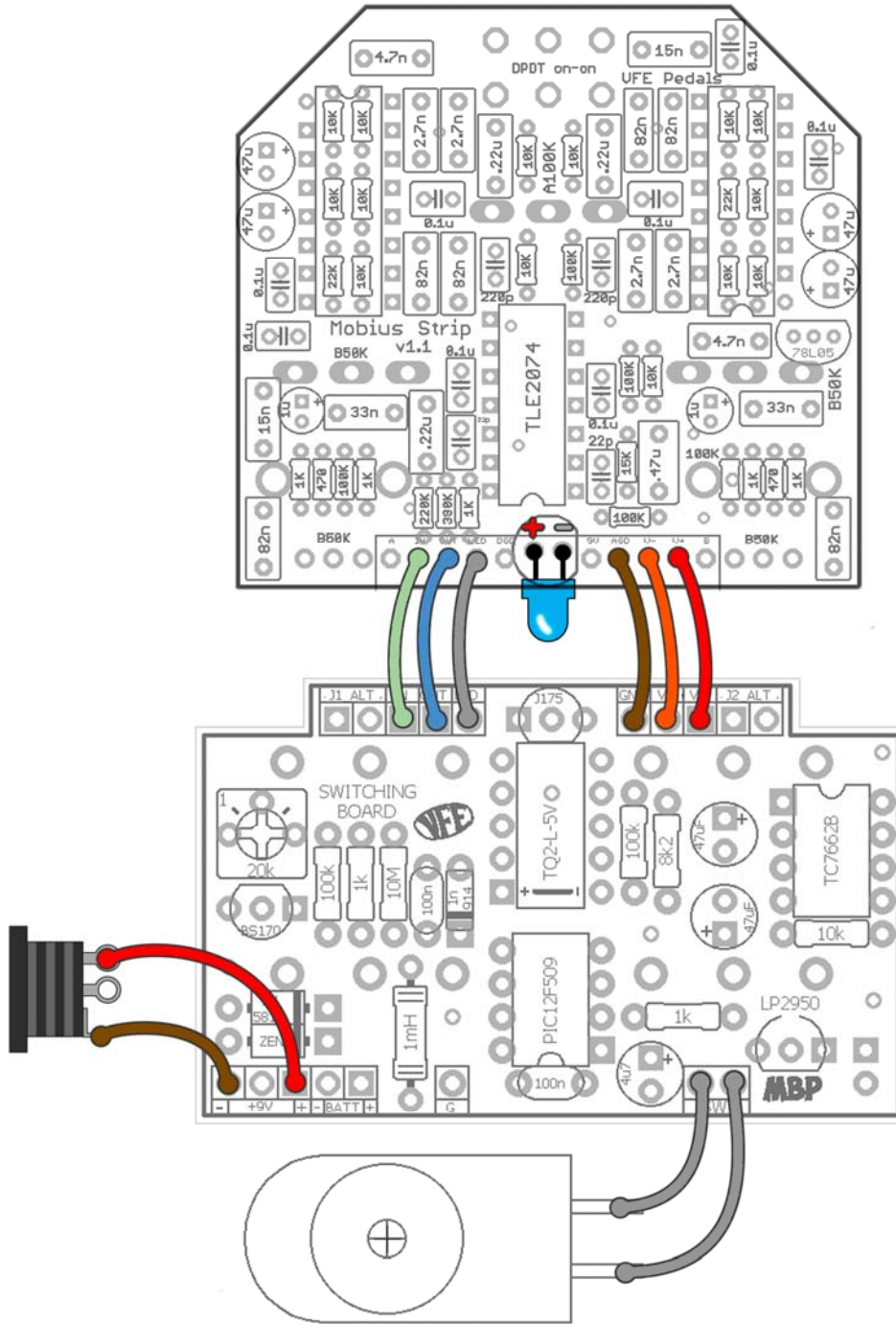http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/

DPDT:
http://www.smallbear-electronics.mybigcommerce.com/dpdt-on-on-solder-term/

Single In-Line Sockets:
http://www.smallbear-electronics.mybigcommerce.com/single-in-line-mill-max/

Wiring

For more detailed wiring information and options, please refer to the "v2" Switching Board doc.

Overview

From the VFE Website: The MÖBIUS STRIP is a delay pedal with twist; intertwining two independent delay signals to create one-of-kind sounds. The MÖBIUS STRIP can create dreamy ambient textures as well as unique rhythmic landscapes. The mode switch selects between basic parallel operation and the three-cycle möbius mode. In möbius mode, the echoes swap back & forth between each delay line, for rhythmic, 3-step patterns unheard of in standard delay pedals.

Controls

Descriptions from the VFE website: **http://vfepedals.com/mobius-strip.html**

TIME 1: Sets the time of the left delay line. Range: 40ms to 580ms.

FB1: Sets the feedback coming out of the left delay line. In parallel mode, it feeds back into itself. In mobius mode, it feeds into the right delay line.

TIME 2: Sets the time of the right delay line. Range: 40ms to 580ms.

FB2: Sets the feedback coming out of the right delay line. In parallel mode, it feeds back into itself. In mobius mode, it feeds into the right left line.

MODE: Toggles between parallel and mobius modes. In parallel mode, each delay feedbacks on itself independent of the other. In mobius mode, the feedback crosses back and forth between both delays.

MIX: Controls the volume of the wet delay mix. We put an excessive amount of gain on tap in this section, so you can overwhelm your tone in ambient sonic landscapes.
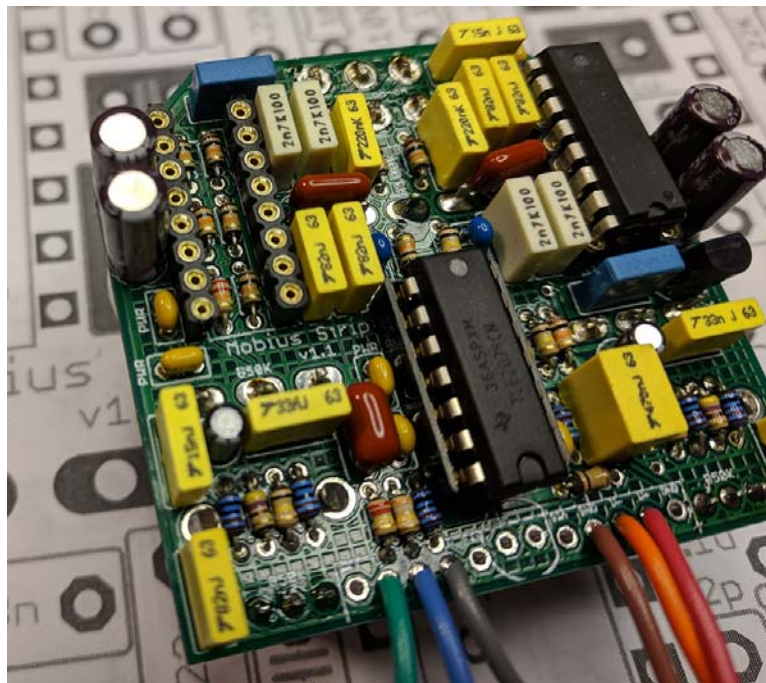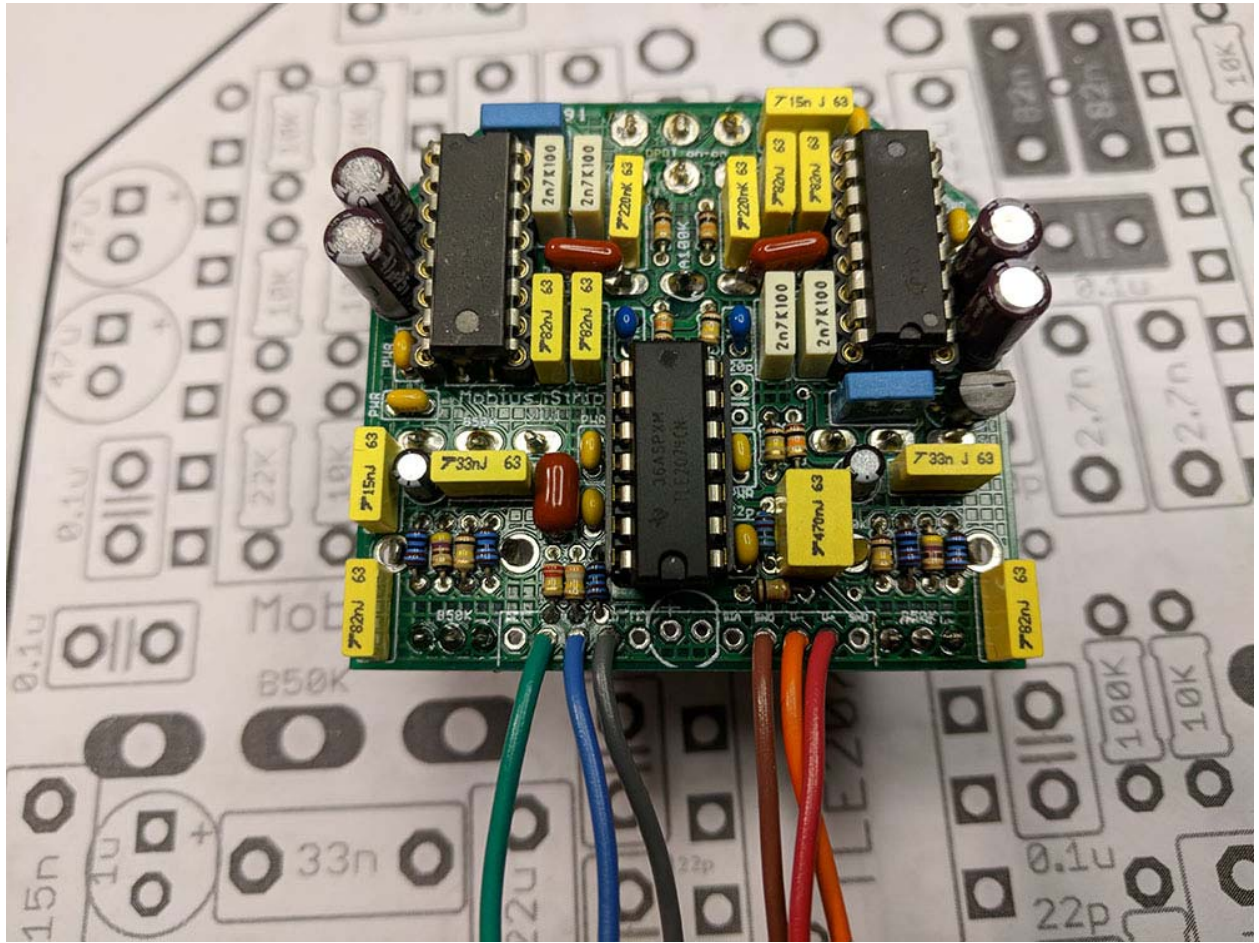
To create the best rhythm tones, set one delay to minimum while you dial in a longer delay time on the second line. Next, increase the time of first delay time until you get a rhythmic pattern.

Notes

Several points on the notations included on the build image Peter provided (on pg.1):

- There are (8) .1uF (100n) caps in the circuit, each spaced at 2.5mm. Six of these caps are MLCC type and are used for power decoupling. The remaining two should be film and are part of the audio path (these are indicated in red). A 5mm spaced box cap might be difficult to fit in those spaces so I provided a link to 2.5mm WIMA caps I found. I used two Panasonic ECQ-V caps and just bent the leads inward to fit in the 2.5mm spacing. BTW: those two 100n film caps are drawn as electrolytic on the PCB – they were probably 1uF in an earlier version of the pedal.

- Peter makes two notes on the 82n caps which I found confusing: all the 82n are 5mm spaced and fit easily in the space provided on the PCB. So, you can just ignore those instructions. I even used my old box caps to make sure.

- The 47uF are indicated as 4mm diameter and 10v. I did not find this to be necessary. I used generic 47uF caps rated at 25v (see my build pic) and they fit fine.

- The two 1uF, however, are very tight. I used mini 1uF electrolytic but tantalums should fit fine there, too. I provided links to both types.

- Do not use regular sockets for the PT2399 because they will not fit over the resistors between the pins. Instead use the single in-line sockets to make a 16 pin socket. See pic below.

- There is one cap to omit (shown by pins 6&7 if the TLE2074. It's not on the PCB image but present on the PCB itself. This cap is not listed in the schematic or BOM.

Build Pic

<u>Voltages</u>

9.42vDC One-Spot Power Supply

Current Draw: 53mA

VFE
Mobius Strip
http://www.vfepedals.com/