From the VFE Website:

http://vfepedals.com/springboard.html

The SPRINGBOARD yields lush and springy verb soundscapes from the BTDR-3H brick. This reverb is not created via DSP algorithms, but rather a patented network of delays with interwoven feedback paths that creates its own reverb category. We added two feedback controls to tailor both the length and tonal structure of the reverb trail. With the active EQ section, the SPRINGBOARD can go from bright to brooding.

HOW THE SPRINGBOARD CAME TO BE

I have been getting requests to make a reverb for years. My response has always been "Reverbs require DSP programming, and I'm not a programmer".

When Belton released their newest BTDR-3H reverb brick, built entirely on discrete delay chips arranged in a patented summing and feedback network, I knew I finally had the missing piece to building a VFE reverb. I experimented with all the extremes of what the brick could do - and what it couldn't do - and found a way to pack everything I discovered inside our compact, standard series casing.

While the sound of the BTDR-3H brick is "spring-y", it's not a spring reverb. By utilizing a new method to create reverberation, it's created a new category of sounds. The Springboard lets you push and pull this new reverb types to every extreme, while still giving control over the subtlest nuances of its soundscape."

VERB: Sets the volume of wet reverb mix. Set it low for a touch of ambience, or crank it to drench your tone in reverb.

LO DAMP: Sets the length of the decay of a darker trails section inside the BTDR-3H brick.

HI DAMP: Sets the length of the decay of a brighter trails section inside the BTDR-3H brick.
The two damping controls are interactive, and together can create lush, long reverb trails.

PRE: This internal trimpot sets the amount of clean pre-gain. We recommend setting it as high as possible - but without pushing the reverb brick into distortion.

DRY: Sets the volume of the dry signal. Set it to unity for standard reverb use, or push it up to boost your solos. You can even remove it altogether for use in parallel FX loops.

BASS: Active bass boost/cut. Use this to tailor the low frequency response of the reverb.

TREBLE: Active treble boost/cut. Use this to set the high frequency response of the reverb.

POST: This internal trimpot sets the amount of clean post-gain. We recommend setting it as low as possible - while still giving you all the output you need for your rig when the DRY and VERB knobs are set to the maximum.
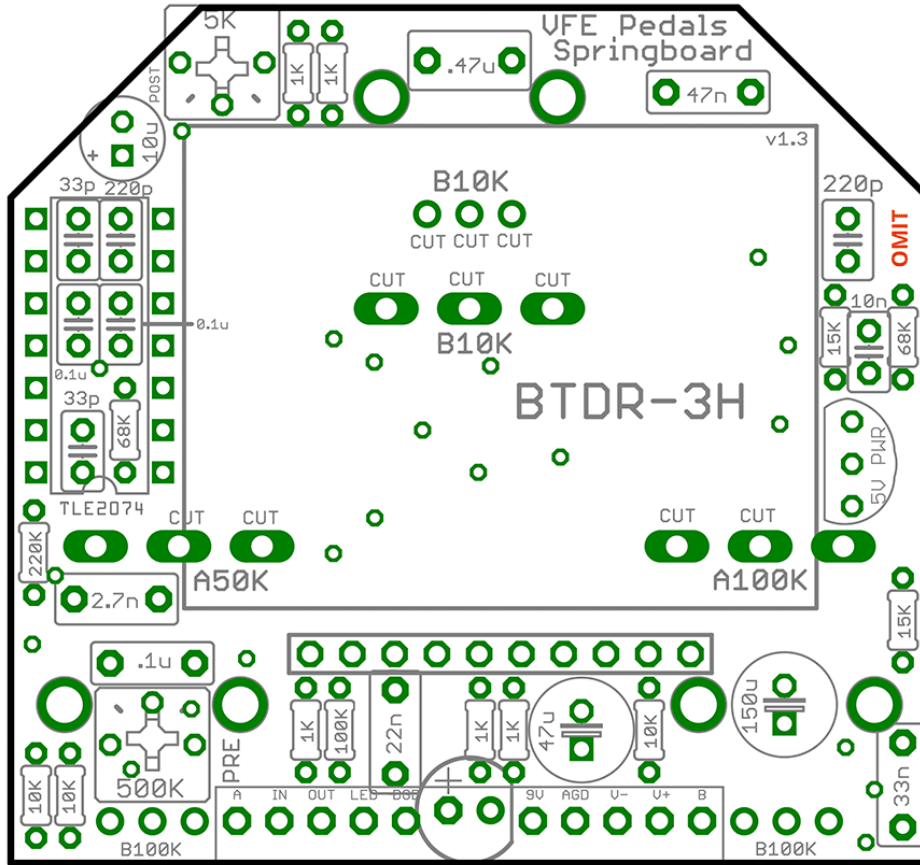
This board was designed before Accutronics changed the casing on the BTDR-3H reverb brick. The new casing is larger, which makes for a very, very tight fit. It is still possible to build, but you'll likely need to get creative to get the 5K post-gain trimpot to fit.

Also, I recommend putting the 47n cap on the bottom, just to give you some extra space.

GOOD LUCK!

Axial parts
5 x 1K
3 x 10K
2 x 15K
2 x 68K
1 x 100K
1 x 220K

2.5mm caps
2 x 33p
2 x 220p
1 x 10n
2 x 0.1u

5mm caps
1 x 47n
1 x .1u
1 x 2.7n
1 x 22n
1 x 33n
1 x .47u

Other
1 x BTDR-3H
1 x TLE2074
   (w/ socket strips)
1 x 5K trim
1 x 500K trim
1 x 78L05
1 x 10u bipolar
1 x 47u
(6.3mm diam, 5mm height)
1 x 150u

Please see my notes on building the Springboard later on in this document.

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.

Trace Routing

Knob Layout

Shopping List

QTY	Value	Type	Rating	Spacing
5	1k	Metal / Carbon Film	1/8W	5mm
3	10k	Metal / Carbon Film	1/8W	5mm
2	15k	Metal / Carbon Film	1/8W	5mm
2	68k	Metal / Carbon Film	1/8W	5mm
1	100k	Metal / Carbon Film	1/8W	5mm
1	220k	Metal / Carbon Film	1/8W	5mm
2	33pF	MLCC	25v min.	2.5mm
2	220pF	MLCC	25v min.	2.5mm
1	10n	MLCC	25v min.	2.5mm
2	100n	MLCC	25v min.	2.5mm
1	47n	Film	25v min.	5mm
1	100n	Film	25v min.	5mm
1	2n7	Film	25v min.	5mm
1	22n	Film	25v min.	5mm
1	33n	Film	25v min.	5mm
1	470n	Film	25v min.	5mm
1	LM78L05			
1	10uF	Bi-Polar		2.5mm
1	47uF			2.5mm
1	150uF			2.5mm
1	BTDR3			
1	TLE2074	or, TL074		
1	5k	Bourns 3362p		
1	500k	Bourns 3362p		
1	10kB	PCB Mount, Plastic Shaft		9mm
2	100kB	PCB Mount, Plastic Shaft		9mm
1	10kB	PCB Mount		16mm
1	50kA	PCB Mount		16mm
1	100kA	PCB Mount		16mm

BOM Notes

33pF: http://www.mouser.com/ProductDetail/KEMET/C320C330J1G5TA/?qs=sGAEpiMZZMt3KoXD5rJ2NxvTsVQ6hWgq-oJLKUAFkWbU%3d

220pF: http://www.mouser.com/ProductDetail/KEMET/C320C221J2G5TA/?qs=sGAEpiMZZMt3KoXD5rJ2N%252bwg-Bl1a522xefKI%252bxFregI%3d

10n: http://www.mouser.com/ProductDetail/TDK/FG18C0G1H103JNT06/?qs=sGAEpiMZZMt3KoXD5rJ2N5U4Cys%-2fUpTlgSWmruA3wbyX7d2yhizmuA%3d%3d

100n: http://www.mouser.com/Search/ProductDetail.aspx?R=C320C104K5R5TAvirtualkey64600000virtu-alkey80-C320C104K5R

470n: https://www.mouser.com/ProductDetail/KEMET/R82DC3470Z360J/?qs=sGAEpiMZZMv1cc3ydrPrF0%2fKYujt-VgoK1HnXG0zURSM%3d

10uF BP: http://www.mouser.com/Search/ProductDetail.aspx?R=ECE-A1EN100Uvirtualkey66720000virtu-alkey667-ECE-A1EN100U

150uF (you can also just use 47uF)**:** https://www.mouser.com/ProductDetail/667-EEU-FR1E151

LM78L05: https://www.mouser.com/ProductDetail/ON-Semiconductor-Fairchild/LM78L05ACZ?qs=sGAEpiMZZMtUqDgmOWB-jgA705Bk4ksC2IOLZH4lnaVg%3d

http://www.smallbear-electronics.mybigcommerce.com/ic-78l05/

TLE2074: http://www.mouser.com/ProductDetail/Texas-Instruments/TLE2074CN/?qs=sGAEpiMZZMtCHixnSjNA6Cumno-LUElGjtkQTPuP%252bT7A%3d

Bourns 3362p (5k): http://www.mouser.com/ProductDetail/Bourns/3362P-1-502LF/?qs=sGAEpiMZZMvygUB3GLcD7pX-z6c6XAR3tLU32B218z4E%3d

Bourns 3362p (500k): https://www.mouser.com/ProductDetail/Bourns/3362P-1-504LF?qs=sGAEpiMZZMvygUB3GLcD-7jPDVBAvd%252b%2fFkHB4%252btzpP0U%3d

BTDR-3H: http://www.smallbear-electronics.mybigcommerce.com/belton-btdr-3h-reverb-modules/

9mm Plastic Shaft (Use 1MB in place of W1M): http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount-w-knurled-plastic-shaft/
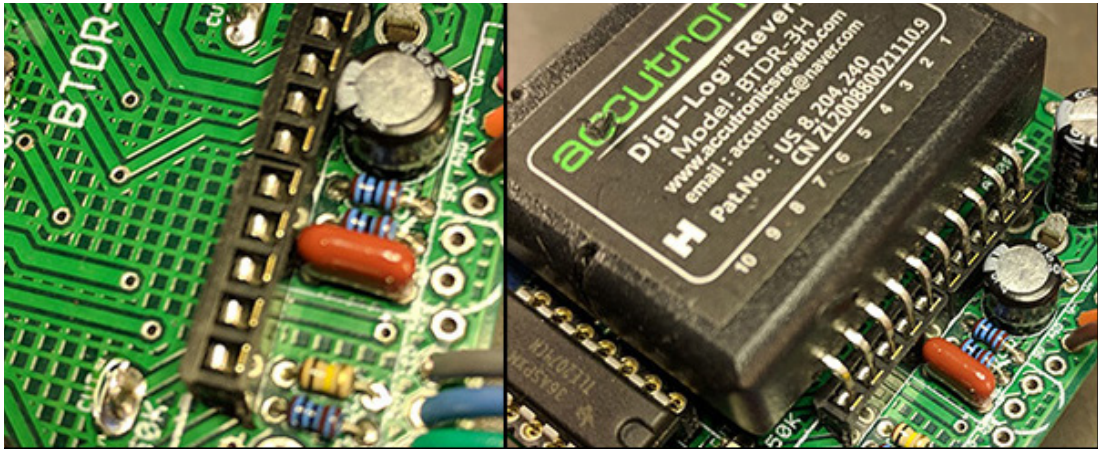
16mm PCB Mount: http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/
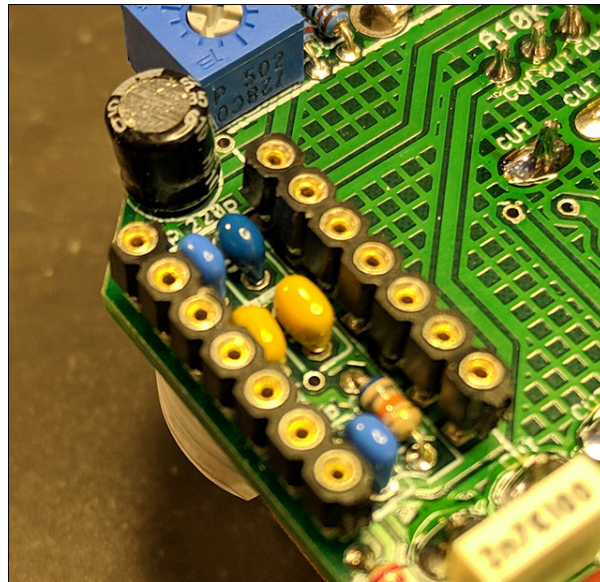
Build Notes

I recommend you <u>do not</u> build the Springboard in a 1590B. Instead, use a 1590B2 or 125B. The 1590B2 has the same foot-print but is taller like the 125B. You can use the standard VFE drilling template if you do use the 1590B2. A 125B template is included in the zip file with this document.

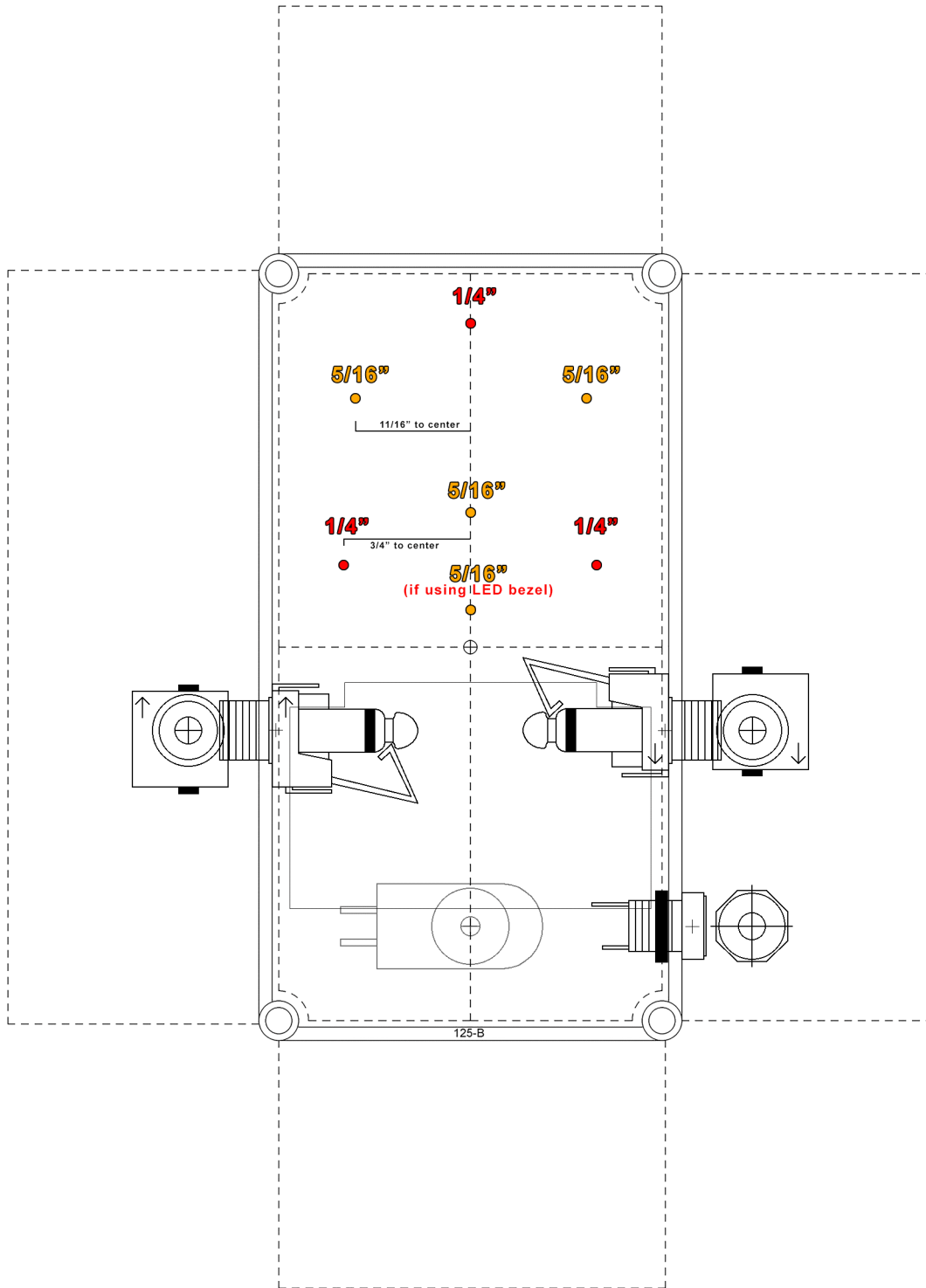For the Belton brick, do the following:
1. Take a standard 14-pin or 16-pin leaf socket (like the ones available at Tayda) and cut out two rows of 5 sockets.
2. Solder these to the row of 10 pads where you would normally solder the brick.
3. Now simply insert the brick into the sockets. When you do it this way, you do not need to trim the pins on the 16mm PCB mounted pots and you still have access to the 5k trimmer in the upper left hand corner of the PCB. If you want to fix the brick more securely, use some Blue Tac or foam tape on the underside to hold the brick in place to the PCB.

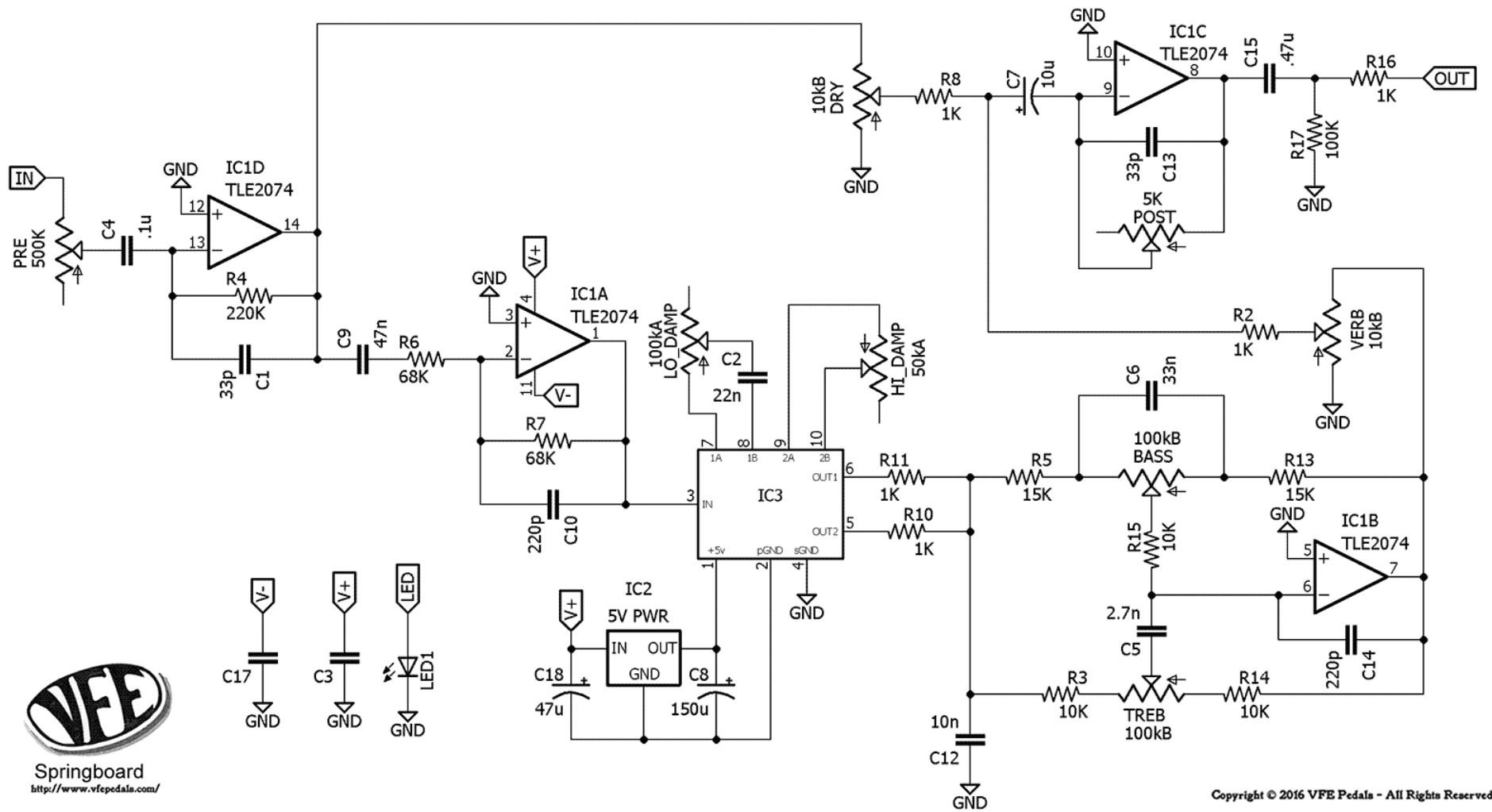For the components under the TLE2074, use single in-line sockets. A DIP socket will not work.

Voltages

9.42vDC One Spot. Voltages taken from "pedal on" state and all knobs at about halfway up.

The lower supply voltages on the TLE2074 are a bit of a surprise but they are correct.

Wiring

This project <u>does</u> require a charge pump on the Switching Board.

125B Drill Guide

1/4"

5/16"   5/16"

11/16" to center

5/16"

1/4"   1/4"

3/4" to center

5/16"
(if using LED bezel)

125-B

This template has not been tested but should be accurate enough. For the 1590B2 enclosure, use the 1590B drill guide in the Switching Board documentation.

Schematic

Springboard
http://www.vfepedals.com/

Build