

PROJECT NAME

# STRATOSPHERE



BASED ON

Ibanez® TS-808 (Narrow Box)

BUILD DIFFICULTY

■□□□□ Beginner

EFFECT TYPE

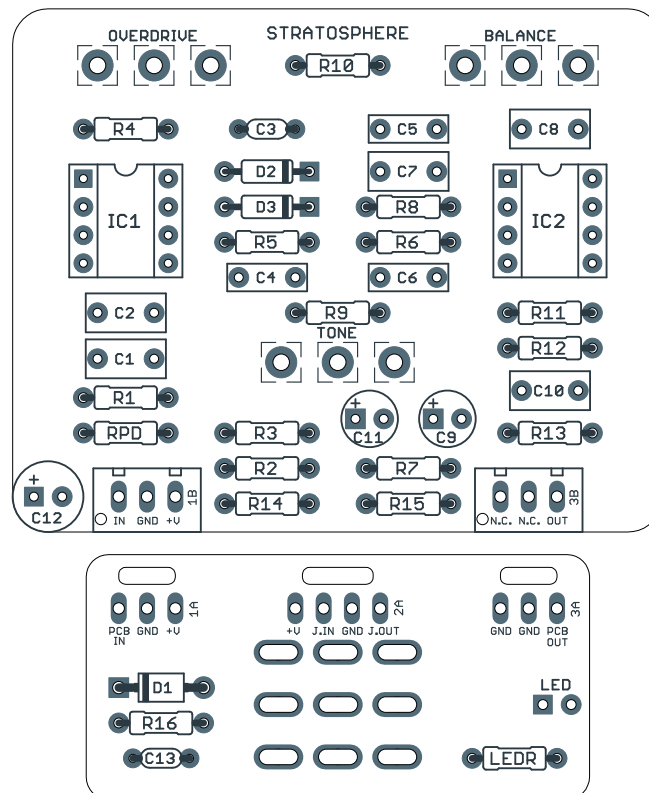
Overdrive

DOCUMENT VERSION

1.0.0 (2021-03-19)

## PROJECT SUMMARY

A replica of the very first Tube Screamer from 1979 which used two dual op-amps instead of one.



Actual size is 2.3" x 1.86" (main board) and 1.78" x 0.86" (bypass board).

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## INTRODUCTION

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The Stratosphere Classic Overdrive is based on the original Maxon OD-808 and Ibanez TS-808 (narrow box) from 1979. This very first version of the Tube Screamer was only made for a short time, and is notable for its use of two dual op-amps instead of using bipolar transistors for the input and output buffers. The op-amps are MC1458/LM1458, which are very similar in specification to the JRC4558D but not exactly the same.

Other than the op-amps, all of the component values are exactly the same, so you probably won't notice a tonal difference between this and a stock Tube Screamer—but if the [Stratus](#) project has too many frills and you want a bit of vintage flavor, this is a great option.

Aion FX traced Maxon's 35th anniversary reissue of the OD-808 in 2021, and having compared it with photos of original units, we're confident this is an accurate representation of the original 1979 circuit. Earlier community schematics had errors, with the JFET switching circuitry removed incorrectly and leaving some unneeded parts. The Stratosphere is a direct adaptation of the OD-808/TS-808 narrow box circuit, but with the JFET switching correctly removed and the circuit converted to true bypass.

## USAGE

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The Stratosphere has the same control layout as most overdrive or distortion effects:

- **Tone** controls the treble response of the effect. The center point (12:00) is flat. When turned to the left, it cuts treble, and when turned to the right, it boosts treble.
- **Overdrive** controls the amount of gain in the op-amp feedback diode clipping stage.
- **Balance** controls the overall output of the effect.

## PARTS LIST

This parts list is also available in a spreadsheet format which can be imported directly into Mouser for easy parts ordering. Mouser doesn't carry all the parts (most notably potentiometers) so the second tab lists all the non-Mouser parts as well as sources for each.

[View parts list spreadsheet](#) →

PART	VALUE	TYPE	NOTES
R1	1k	Metal film resistor, 1/4W	
R2	510k	Metal film resistor, 1/4W	
R3	10k	Metal film resistor, 1/4W	
R4	51k	Metal film resistor, 1/4W	
R5	4k7	Metal film resistor, 1/4W	
R6	1k	Metal film resistor, 1/4W	
R7	10k	Metal film resistor, 1/4W	
R8	220R	Metal film resistor, 1/4W	
R9	1k	Metal film resistor, 1/4W	
R10	1k	Metal film resistor, 1/4W	
R11	100k	Metal film resistor, 1/4W	
R12	220R	Metal film resistor, 1/4W	
R13	10k	Metal film resistor, 1/4W	
R14	10k	Metal film resistor, 1/4W	
R15	10k	Metal film resistor, 1/4W	
R16	100R	Metal film resistor, 1/4W	Power supply filter resistor.
RPD	2M2	Metal film resistor, 1/4W	Input pulldown resistor.
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	1uF	Film capacitor, 7.2 x 3.5mm	
C2	1uF	Film capacitor, 7.2 x 3.5mm	
C3	47pF	MLCC capacitor, NP0/C0G	51pF in original, but 47pF is the nearest readily-available value.
C4	47n	Film capacitor, 7.2 x 2.5mm	
C5	220n	Film capacitor, 7.2 x 2.5mm	
C6	220n	Film capacitor, 7.2 x 2.5mm	
C7	1uF	Film capacitor, 7.2 x 3.5mm	
C8	1uF	Film capacitor, 7.2 x 3.5mm	
C9	OMIT		4.7uF in original. See build notes.
C10	1uF	Film capacitor, 7.2 x 3.5mm	
C11	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C12	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C13	100n	MLCC capacitor, X7R	Power supply filter capacitor.

## PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	
IC1	LM1458	Operational amplifier, DIP-8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	LM1458	Operational amplifier, DIP-8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
DRIVE	500kA	16mm right-angle PCB mount pot	
TONE	20kW	16mm right-angle PCB mount pot	
BAL.	100kB	16mm right-angle PCB mount pot	
LED	5mm	LED, 5mm, red diffused	
IN	1/4" stereo	1/4" phone jack, closed frame	Switchcraft 112BX or equivalent.
OUT	1/4" mono	1/4" phone jack, closed frame	Switchcraft 111X or equivalent.
DC	2.1mm	DC jack, 2.1mm panel mount	Mouser 163-4302-E or equivalent.
BATT	Battery snap	9V battery snap	Optional. Use the soft plastic type—the hard-shell type will not fit.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

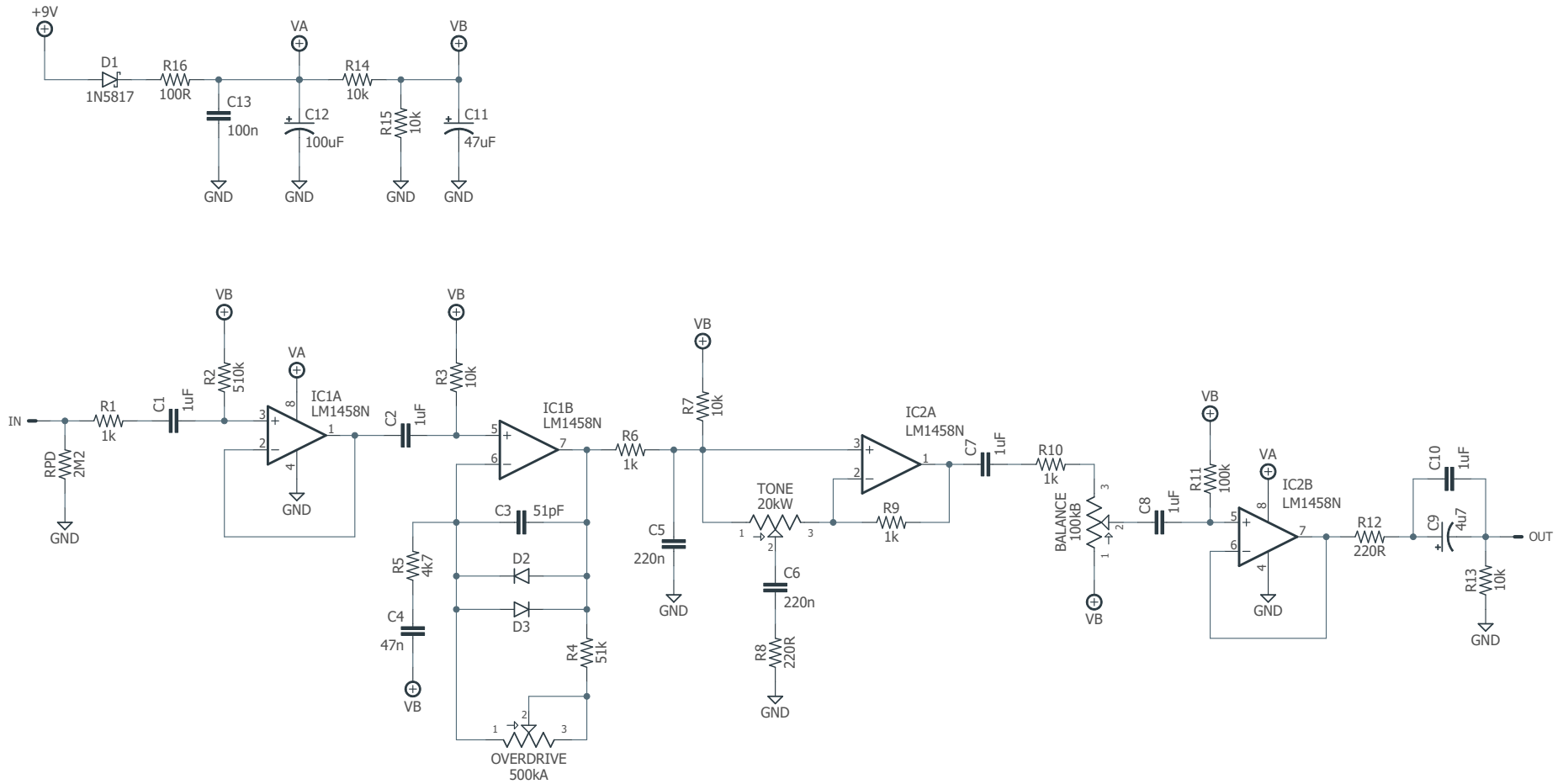
## BUILD NOTES

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### Electrolytic capacitor

The original OD-808 used a 4.7uF electrolytic capacitor for C9. Since film is much better than electrolytic in quality and reliability for coupling audio signals, this project replaces it with 1uF film (C10) which is in parallel. It's recommended to omit C9 entirely and use only C10, but you can use the electrolytic instead if you prefer.

# SCHEMATIC



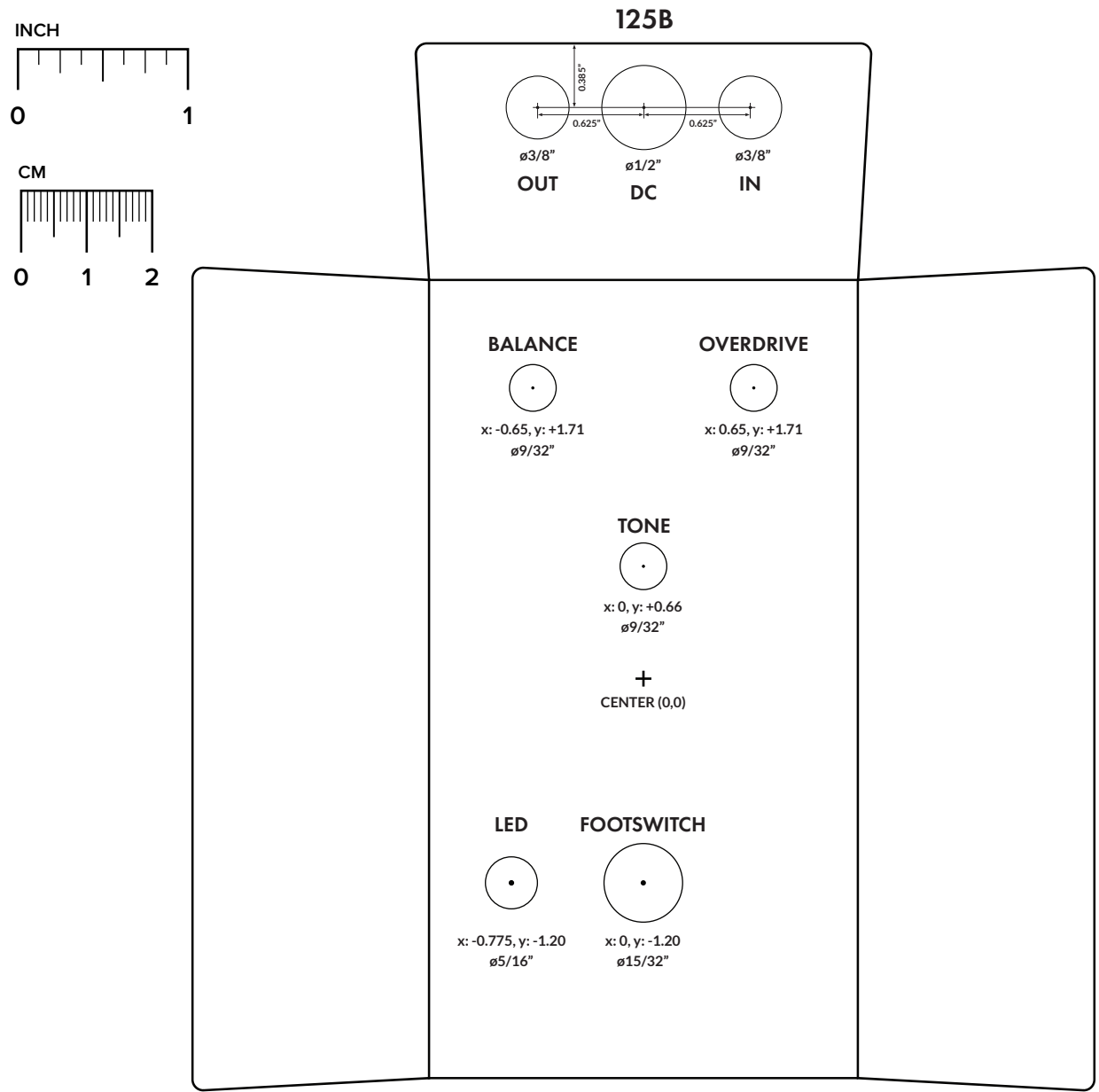
# DRILL TEMPLATE

Cut out this drill template, fold the edges and tape it to the enclosure. Before drilling, it's recommended to first use a center punch for each of the holes to help guide the drill bit.

Ensure that this template is printed at 100% or "Actual Size". You can double-check this by measuring the scale on the printed page.

**Top jack layout** assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the [Open-Frame Jack Drill Template](#) for the top side.

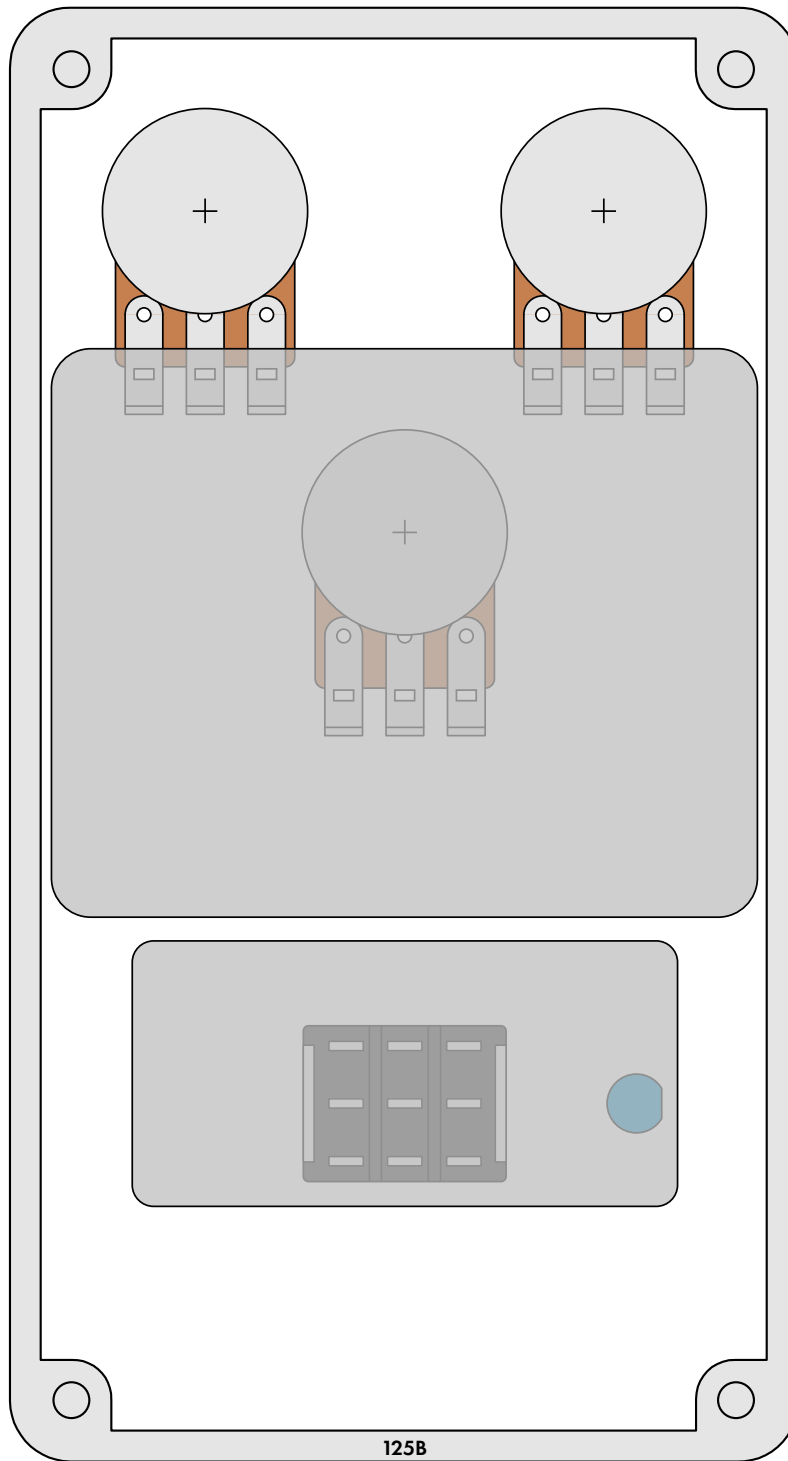
**LED hole drill size** assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.



# ENCLOSURE LAYOUT

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Enclosure is shown without jacks. See next page for jack layout and wiring.





# WIRING DIAGRAM



*Shown with optional 9V battery. If battery is omitted, both jacks can be mono rather than one being stereo.  
Leave the far-right lug of the DC jack unconnected.*

## LICENSE & USAGE

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**No direct support is offered for these projects beyond the provided documentation.** It's assumed that you have at least some experience building pedals before starting one of these. Replacements and refunds cannot be offered unless it can be shown that the circuit or documentation are in error.

**All of these circuits have been tested in good faith in their base configurations.** However, not all the modifications or variations have necessarily been tested. These are offered only as suggestions based on the experience and opinions of others.

**Projects may be used for commercial endeavors in any quantity** unless specifically noted. No attribution is necessary, though a link back is always greatly appreciated. The only usage restrictions are that **(1) you cannot resell the PCB as part of a kit without prior arrangement, and (2) you cannot “goop” the circuit, scratch off the screenprint, or otherwise obfuscate the circuit to disguise its source.** (In other words: you don't have to go out of your way to advertise the fact that you use these PCBs, but please don't go out of your way to hide it. The guitar effects industry needs more transparency, not less!)

## DOCUMENT REVISIONS

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### 1.0.0 (2021-03-19)

Initial release.