

Key Features:

- 100% Class-A discrete signal path
- Ultra-fast "FET" response
- Attack & Release presets
- Studio-grade "discrete" preamplifier
- Rugged VU-style meter
- Low-noise electronics
- Optimised for guitar but also great for processing recorded instruments
- 50 hrs from 9V cell in non transformer mode
- Traditional Through-Hole PCB
- 100% Class-A discrete output-amplifier
- Custom-designed transformer driving a pair of outputs
- Unbalanced instrument output
- Balanced line output
- Ground-lift function
- Signal-pad for DI (balanced output only)
- Gain-switch adjusts level through transformer circuitry, for increased saturation
- Voltage sensing circuitry shuts down transformer circuitry when powered from a battery or low-voltage supply

INSTRUCTIONS / INFORMATION



The Cali76 is a premium-quality, 1960s-style FET compressor, inspired by the legendary Urei 1176. The idea behind this design was to bring the sonic properties of this revered studio-classic into the scope of the average guitar-geek...

The topology of the design was kept true to the original, whilst the actual circuitry was carefully condensed. In this way it has been possible to retain the much-loved dynamic-response of the original, whilst at the same time permitting a smaller, more stage-friendly format!

Origin have also included a studio-grade 1960s-style discrete preamp, to work as an interface between your guitar and the compressor. The preamp provides gain as well as the optimum conditions for signal transfer.

The transformer output stage works in conjunction with the pedal to provide the user with additional tone-options and connectivity.

A custom-designed transformer sits at the heart of the output stage. The core-size and material have been selected to contribute harmonics when driven by the Class-A, transistor-based, output amplifier.

The Cali76 is a great performance tool, but is by no means limited to this task. Recording guitarists will find the unit highly useful for post-processing drums, bass and vocals.

Example Settings for Electric Guitar

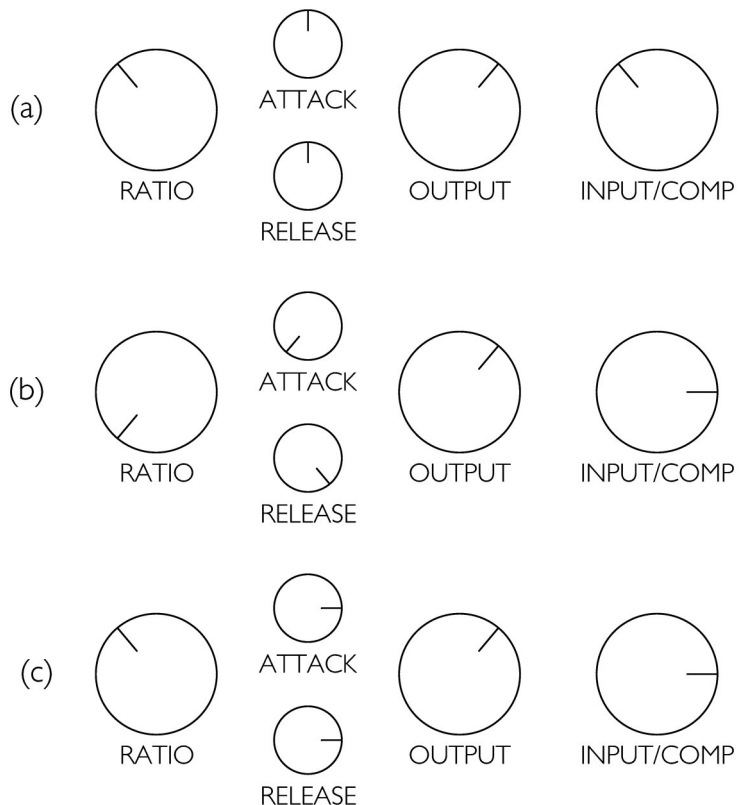


Figure 1: Useful Settings: (a) subtle compression; (b) percussive compression; (c) spongy compression (try "popping" strings when soloing).

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Input/Comp Control

The Cali76 features a very nice studio-grade input preamplifier. This works as an interface between the guitar and the compressor section. In exactly the same way a studio-engineer will first amplify a dry guitar signal before applying additional processing.

The "INPUT/COMP" control allows the user to vary the gain of this preamplifier. Turning this control clockwise increases the overall gain of the pedal. This also increases the amount of compression. The guitar will become increasingly more touch-sensitive. Too much gain and the preamplifier will clip and distort.

Compression is greatly reduced at lower gain settings as much of the signal entering the compressor section falls below the compressor's internal threshold. Signal level must exceed this threshold in order to initiate gain-reduction. In this scenario only the signal-peaks are compressed.

Output

The Output control simply varies the level of signal present at the pedal's output jack. This can be set in order to keep the overall effected-level close to the, dry (bypass) signal. Alternatively, the level can be increased to help project a guitar solo.

Attack & Release

Attack & Release controls are all too often misunderstood, which is unfortunate as they are instrumental in achieving a usable sound. In most cases Attack & Release parameters should be adjusted to optimise the compressor's dynamic response to that of a particular instrument. However, they can also be adjusted to create strong dynamic effects.

The Attack control determines the time taken for the compressor to react to the presence of a signal, i.e. the delay from the instant when you play the note, to the moment the compressor actually reduces the gain. The longer the Attack-time/delay, the more pronounced the beginning of each note will sound.

In the context of the guitar - you may make the following observations when adjusting Attack settings:

Increasing Attack-time highlights the percussive "snap" of strongly picked notes.

Reducing Attack-time may impart a "spongy" feel to the character of the compressor - especially when "digging-in" to single notes!

Reducing the Attack-time to a very short time will result in undesirable distortion being generated - this will be heard to a greater extent when playing bass notes.

The Release control determines the duration of any gain reduction. This would be measured from the time that compression is triggered to the point that the compressor has returned to its idle state. For maximum effect when processing guitar, the Release must be set so that the compressor responds fully to every note played. If so, the release time must be short enough for the compressor to fully recover in the short time between one note ending and the next note beginning.

Ratio

The Ratio control allows the user to adjust the amount of gain reduction applied for any given increase in guitar signal. At the lowest ratio-setting, doubling the input signal (an increase of 100%) will result in the output increasing by 19%. At the highest ratio-setting, the output would rise by only 3.5%, for the same increase in input signal. The latter case represents "Limiting".

As was the case in the Urei 1176, changing the ratio setting also varies the threshold level of the unit. This helps to keep the output at a consistent level, regardless of settings.

Example Settings

Figure 1 presents some useful starting points, intended for use with guitar. Figure 4 consists of some more examples for use in processing various recorded instruments.

Bypass Mode (Internal Selection)

In non-transformer mode, i.e. when powering from a battery or 9V supply, the bypass mode can be selected internally by changing the positions of four internal jumper-connectors. "True-Bypass" can be obtained with all four jumpers in the lower-position. A low impedance, or buffered-bypass, mode can be selected by moving all four jumpers to the upper-position. In buffered-bypass, the pedal will ensure that signal integrity is preserved even when driving long cable runs.

Jumpers can be simply pulled away and pushed back into place. Spare jumpers can be easily obtained if required.

When actively engaged, through the use of an 18V supply, the transformer-board effectively buffers the signal at all times, even when the unit is bypassed. For an optimum input impedance of 1.1MOhms, please get the jumpers to the buffered position.

Please note that any saturation/overdrive experienced with the "GAIN" switch set in the "HIGH" position, will also be audible with the unit set to bypass - just like driving a Urei 1176 with the compression bypassed/defeated. If this proves to be a problem, you may want to consider purchasing an external bypass-looper in order to fully bypass the Cali76.

Using an external bypass-looper would give you three useful pre-sets: dry signal; transformer-coloured dry signal; and lastly, compressed signal also with transformer colouration.

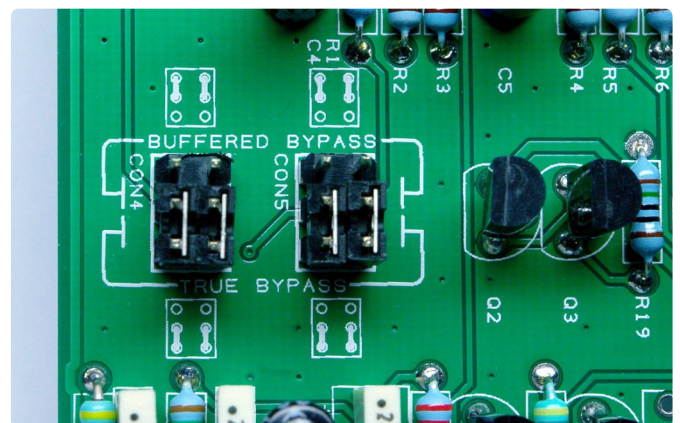


Figure 2: J4, J5, J6, J7: Bypass Jumper-Connectors.

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Input Sensitivity / Jumpers

The latest version of the Cali76 features a set of jumpers that give the user control over the sensitivity of the unit.

Should you prefer to have the input/gain control set very low, it could be worth experimenting with the jumper arrangement shown in figure 3. This will almost certainly help users to obtain more rotational resolution in a pro-audio set-up, where signals are relatively large.

Moving the jumper progressively right will result in more input attenuation and less sensitivity.

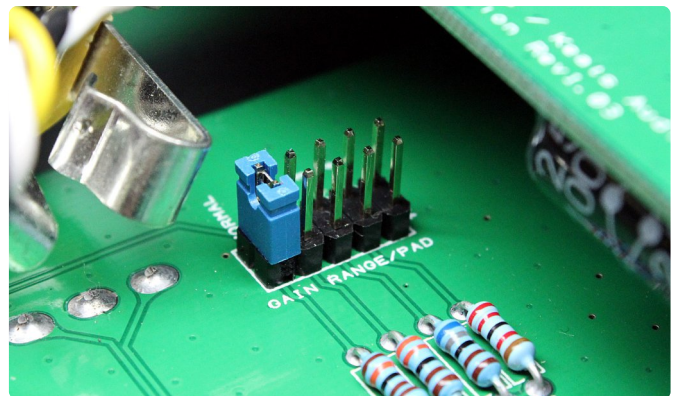


Figure 3: Input sensitivity jumpers on Cali76TX.

Power Requirements: Battery vs. Supply Operation

The transformer-circuitry consumes a relatively large amount of supply-current and makes battery operation simply not viable. For this reason a unique battery-mode of operation shuts down the transformer circuitry to preserve battery life.

In transformer-mode, the extra current is put to use by the Class-A transistor output-stage, in order to drive problematic loads with ease (such as long cable runs as well as the low-impedance inputs of some vintage studio equipment).

Just as importantly, the extra current-drive can be used to push the output-transformer into saturation. This generates frequency-dependant harmonics and subtle overdrive.

Unfortunately, a standard 9V battery just couldn't supply this level of current for long enough to be practical, as the user would need to change batteries every few hours to maintain optimum results. For this reason we decided to opt for an automatic system that shuts-down the transformer board when a low-voltage supply is detected and so this applies to external supplies as well as internal battery-usage.

At low voltages, the signal is "diverted" around the transformer circuitry via a high-quality relay.

The transformer automatically switches in and out around 12V. Using a supply with a voltage in this region should be avoided as it may result in the pedal intermittently switching between transformer-enabled and transformer-bypass modes.

Power Requirements: General Considerations

The internal 9V battery will provide good-quality operation for approximately 50 hours. After this time the user may choose to fit a fresh battery. This can be done easily by removing the four screws from the base of the enclosure. From here the new battery just clips into place. Be careful not to knock any of the components on the circuit-board.

Alternatively, an external supply can be used. A high quality regulated supply should be chosen to avoid damage from voltage-surges and other over-voltage conditions. The connector should be the 2.1mm type with the centre-pin "Wired-Negative".

For best performance, the pedal should be powered from an 18V supply. This will increase the headroom, allowing cleaner processing of conventional guitar signals. This will also permit the use of hotter source signals, such as active guitar pickups.

A PSU with a current rating of at least 200mA is preferable,

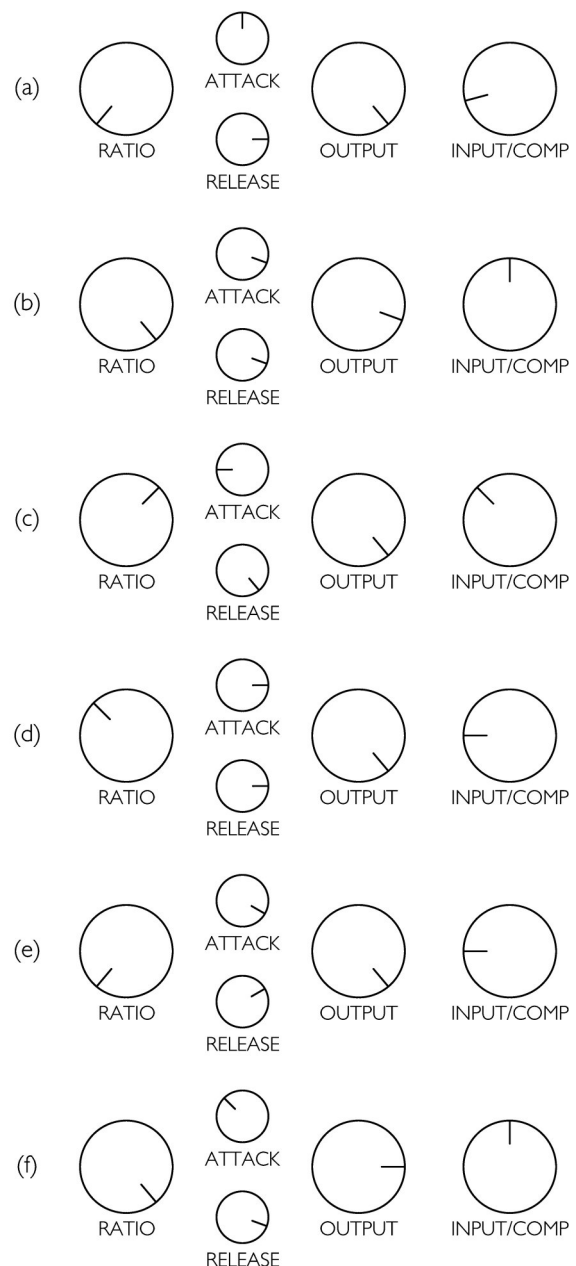


Figure 4: Useful Settings: (a) vocals - subtle compression; (b) vocals - limiting; (c) acoustic guitar / piano; (d) bass; (e) drums - subtle compression (famous Dr.Pepper Setting); (f) drums - "pumping" hard compression.

Note: All source signals normalised to -10dBV.

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due to the ability to supply sufficient in-rush current to ensure a clean start-up. Some low current supplies will intermittently shut-down due to protection circuitry, which results in an audible relay "flutter".

It's unnecessary to remove the battery when using an external supply. There is no risk of damage to either the battery, supply or pedal. However, as is the case with all battery powered goods, old batteries are prone to leaking and so should not be left installed for prolonged periods of time.

Output Connections

The standard Cali76 features a single medium-impedance output. This can be used to connect the pedal to any high-impedance input, such as the input of a guitar/bass amplifier.

In contrast, the transformer-enabled pedal offers two ultra-low-impedance outputs.

The "AMPLIFIER" output provides an unbalanced signal referenced to ground. This is ideal for connecting to your guitar/bass amplifier.

The "LINE/DI" output provides a fully balanced signal via a TRS output socket, and can be used to connect to recording consoles, mixers, sound-cards, mic-preamplifiers etc... Please note that output signal level does not conform to the +4dBm professional studio convention, and so some additional amplification may be required.

The "PAD" switch can be used to drop the signal by around 28dB, and this should give the user enough range to be able to plug into both line-level, and mic-level inputs.

The "GND" switch (ground-lift) can be used to cure annoying hums and other ground-loop-related issues.

Usefully, the "LINE/DI" output can be used to feed the input of a second guitar/bass amplifier by simply using a standard mono guitar lead. The ground-lift function is a must here as it will dispense with the ground-loop related hum normally generated when "Y-connecting" amplifier inputs (especially true when connecting the inputs of high-gain amplifiers).

Headroom Adjustments: "GAIN" Switch

This switch changes the gain of the output amplifier (i.e. the amplifier driving the primary of the output transformer).

The "LOW" setting is the "stock/normal" setting. Using the "HIGH" setting boosts the internal gain by around 9dB.

The "LOW" setting is clean and dynamic. However, when using the "HIGH" setting, you'll notice that the output-amplifier and transformer begin to run out of headroom. Overall the sound is richer in harmonics, becoming "edgy" sounding and ultimately clipping!

The change in gain can be clearly heard when using the "LINE/DI" outputs. Using the "GAIN" switch will therefore require small level-adjustments to be made on any connected mixing consoles etc...

In contrast, the "AMPLIFIER" output remains at a consistent level, due to a variable passive-attenuator network that perfectly counter-acts the level-shifting effects of the "GAIN" switch. This allows you to monitor the shifting tonal-effects through your guitar/bass rig, without having to tweak your amplifier's volume control.

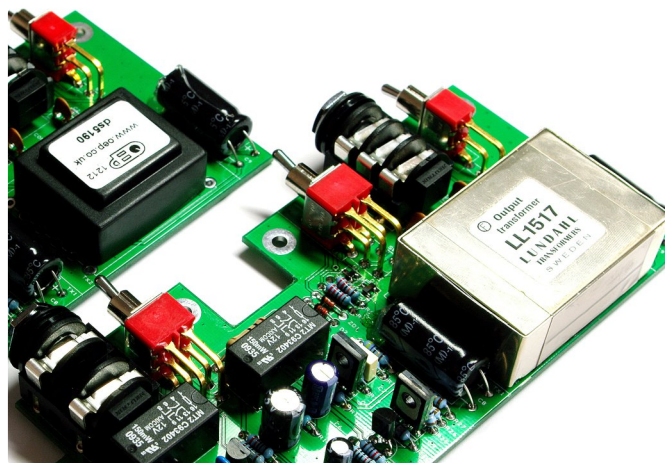


Figure 5: Transformer comparison: Iron-Core on left; Lundahl on right.

Transformer Options

The Cali76-TX is available with a choice of two transformers.

An iron-core transformer is fitted as standard. The core is designed to subtly saturate at high levels.

A studio-grade transformer, manufactured by Lundahl, offers greater linearity and flatter phase response. Often the preferred choice for studio-use.

About Origin Effects

Origin Effects is the brainchild of Simon Keats, a guitarist, electronic engineer and analogue circuit designer who has worked for the likes of Vox, Focusrite and Trident Audio. Having built bespoke effects for professional musicians and producers for many years, he launched the Origin Effects brand in 2012 to bring his exceptional designs to a wider audience.

His first two pedals - the 1176-inspired Cali76 compressor and the unique SlideRIG, which chains two 1176-style compressors together for near-infinite clean sustain - have been widely recognised as the best pedal compressors ever made. Users range from guitarists and bass players like David Gilmour, Pino Palladino and Steve Lukather to Grammy Award-winning producers like Paul Epworth, Ross Hogarth and Terry Britten.

In July 2015 Origin introduced five brand-new compressor pedals. The Origin Compact Series fits the same discrete Class-A circuitry and peerless 1176-style FET compression found in the Cali76 and SlideRIG pedals into five compact stompboxes. The new pedals retain the high-current, low-noise circuitry and discrete Class-A signal path of the originals, while adding a host of new features designed with the player in mind.

Please note that Simon Keats & Origin Effects are in no way affiliated with Urei or Universal Audio.

T: +44 (0)800 810 1070 E: info@origineffects.com

Origin Effects Limited, First Floor Office, Unit C6 Station Yard, Thame, Oxfordshire, OX9 3UH, UK.

www.origineffects.com