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Cry baby schematic layout

Here's one of the most classic effects of all time, Cry Baby wah-wah from Dunlop. The big red thing in the layout is the fasel coil, and on board there is room for a resistor to pull on the entrance, if you need it, just did not include it in the figure. What else can you say? Just build it! Although I have wah template loaded I might as well add this too:o) Again thanks mmolteratx for the scheme. Original Info: When people talk about wah-wah pedals, they talk about Cry Baby Wahs. This is the one that created some of the most timeless sounds in rock. The pedal that eventually became Cry Baby was created in 1966 by engineers from the Thomas Organ Company. This new and expressive effect was an instant hit among players such as Jimi Hendrix and Eric Clapton, who to this day contributed to the huge popularity of Cry Baby Wah. While other effects come and go, Cry Baby Wah just gets better with age. Bem-vindo, Visitante. Cf faça thing about Login ou Registro. 08 de Janeiro de 2021, as 09:06:34 Páginas: [1] Ir couple o Fundo Author Tópico: cry baby 95Q - SCHEMATIC (Lida 3260 vezes) Author Theme: Help understand pcb layout on clone Cry Baby (Read 7419 times) Dunlop Crybaby is a Wah-Wah pedal released around 1982. The pedal is a copy of the original VOX model made by VOX/Thomas Organ Co. in 1970. The effect is basically a bandpass filter, increases the resonant frequency of about 750Hz soothing above and below the harmonics. Rocket pedal operation moves the resonant frequency up and down. Due to the great success of the pedal, being perhaps the most sold guitar pedal of all time, Dunlop has produced several versions of the Wah-Wah and signature models, adding chassis customization and modifications to small circuits. This study focuses on the first model, the Dunlop Crybaby GCB-95, which is considered a classic wah ton. Contents. 1. Wah-Wah.2 effect. Dunlop Cry Baby GCB-95 Circuit. 2.1 Dunlop CryBaby Wah GCB-95 Guts/PCB Chip. 2.2 Dunlop Cry Baby GCB-95 Frequency Response. 2.3 Dunlop CryBaby GCB-95 VS. VOX V847 Differences. 2.4 Dunlop CryBaby GCB-95 Circuit Bias 2.5 Dunlop Cry Baby GCB-95 Components Part List / Bill of Materials.3. Power Supply.4. Input Buffer.5. Active filter.6. Exit stage.7. How Dunlop Cry Baby GCB-958 works. Dunlop Cry Baby GCB-95 Modifications Wah.9. Resources. 1. Wah-Wah effect. The Wah-Wah pedal was invented in November 1966 by Lester Kushner and Brad Plunkett working at Warwick Electronics, a division of Whirlpool that owned the Thomas Organ Company and Vox. Thomas Organ patented the design of the Wah circuit, but by the time the patent was granted, there were already dozens of copies of the pedal on the market. The enforcement of the patent was too costly, so no attempt was made to stop knocking. Dunlop began producing the Cry Baby GCB-95 in 1982, copying the original VOX design under license, becoming the most sold pedal of all time. Dunlop Wah-Wahs models include: GCB-95, GCB-95F Classic, GCB-95Q, GCB-535Q, EW-95V, 105Q Bass and 1999 Purple, White, Red or Gray Limited Edition. Signature models include: JH-1 Jimi Hendrix, JH-1FW Jimi Hendrix Fuzz Wah, DB-01 Dimebag Darrel, ZW-45 Zakk Wylde, SC-95/SW-95 Slash Signature, EVH Signature, KH-95 Kirk Hammett, JC-95 Jerry Cantrell, etc... 2. Dunlop Cry Baby GCB-95 Circuit. The Dunlop Cry Baby GCB-95 scheme can be divided into four blocks: power supply, input buffer, active filter and output stage. The track is undoubtedly inspired by the VOX V847. One of the main problems of the original VOX design was the suing of the tone due to the low input impedance of the input stage, which was 69.5KΩ. Dunlop fixed this issue by adding a buffer that raises input impedance to 1MΩ while preserving the original guitar tone. In addition to the input buffer, there are only two changes in the circuit: r4 size (from 510Ω to 390Ω): creating a slightly higher voltage gain in phase Q1. The R8 is also reduced (from 100KΩ to 82KΩ): this change simply changes the deviation of Q1 slightly without affecting the tone at all. This is just a component resource change. The structure is built on 3 cascading stages of the transistor with several passive components and an inductor; simple circuit makes power consumption below 1mA. At the heart of the project is the way in which the resonant frequency of the LC filter consisting of a fixed L1 inductor and a fixed C2 capacitor can be changed using a variable VR1 resistor. 2.1 Dunlop CryBaby Wah GCB-95 Guts/PCB Chip. Before 1990, all Dunlop Wah pedals had wires between the slots and the circuit board. In the mid-1990s, Dunlop changed the design of the circuit board and began assembling the slots directly on the circuit board. In addition, since mid-1991, a buffer circuit has been added before the actual wah circuit (it is there if the pcb says Rev F or higher). The current version looks similar to the models that have been in operation since mid-1992. For more detailed information on the different versions of the circuit, please visit the StinkFoot website. The single-layer circuit board fits seamlessly inside the large pedal housing with through elements. 2.2 Dunlop Cry Baby GCB-95 Frequency Response. The frequency response is characterized by a resonant peak centered at 750 Hz (with a variable VR1 resistor in the middle position). The peak moves up and down from 450 Hz to 1.6 kHz. Selected frequencies are amplified to 18dB while the surrounding frequencies are attenuated: 2.3 Dunlop CryBaby GCB-95 VS. VOX V847 Differences. The circumference of these 2 pedals is very similar; Dunlop design contains buffer to maintain signal integrity, but the price (Dunlop slightly cheaper), quality and the sound are really similar. Players often choose between them only to look. Dunlop CryBaby GCB-95 Vs VOX V847 Frequency Response: Crybaby has slightly less bass. You can see in the chart below how low harmonic freqs are more present in VOX than in Dunlop because of the input buffer that filters some of this bass content. 2.4 Dunlop CryBaby GCB-95 Circuit Bias The most important points of DC deviation are shown in the following illustration. This is useful for troubleshooting circuit failures: 2.5 Dunlop Cry Baby GCB-95 Components Part List/Bill of Materials. Q0 MPSA13Q1 MPSA18Q2 MPSA18Cin1 0.01uFCin2 22pFC1 0.01uFC2 0.01uFC3 04.7uFC4 0.22uFC5 0.22uFC6 220uFC7 0.1uFL1 500mHRin1 2.2MΩRin2 1.8MΩRin3 1KΩRin4 10KΩR1 68KΩR2 1K5ΩR3 22KΩR4 390ΩR5 470KΩ R6 470KΩR7 33KΩR8 82KΩR9 1KΩR10 10KΩVR1 100KΩInput/Output Jack Connector.True Bypass Switch. 3. Power supply. The simple power phase ensures stable circuit power supply. 9V power supply will power transistors. The ZL9M3 is a 9.1 zener diode that helps regulate the power line (protecting the circuit from voltage peaks above 9.1V) and also prevents reverse polarity. C6 and C7 capacitors between 9V and ground remove noise from the power line. 4. Input buffer. The first stage is an amplifier emitter / common collector NPN amplifier, with unity voltage gain, high input impedance and low output impedance, which makes it very suitable for signal buffering, avoiding high frequency signal loss: Cin1 0.01uF input capacitor isolates the guitar from any dc potential of the pedal, protecting the transducers in the event of circuit failure and removing noise. The Rin1 and Rin2 resistors form a voltage divider to deviate from the Q0 transistor. The Rin3 resistor in the collotrial is attached to the dampening of the oscillation trend. Dunlop Cry Baby GCB-95 Input Impedance: For simplicity we can ignore Rin3, input impedance is Rin1 parallel to Rin2 and input impedance of the emitter supervisor. It can be calculated according to the formula: $Z_{in}= R2//Rin2//Zin_{BJT}= 2M2//1M8//(5000 \cdot 10K)=1M$ 1MΩ can be considered good input impedance to avoid signal degradation. The Rin3 resistor effect reduces this value to 750KΩ, which is still a good input resistance value. Note: The hybrid-pi model and the math behind the voltage gain and input impedance calculations are similar to the Tube Screamer input buffer, check it out for more details. 5. Active filter. The active filter stage is a common-emitter amplifier with a voltage valve feedback network: C1 is a bypass capacitor that isolates the input buffer from the Active filter. The R1 resistor is almost the entire input impedance of this stage of the active filter and helps to increase the input impedance of this integrity of the signal. Resistors R6 and R8 form a voltage divider to determine the deviation applied to base Q1 by the L1 coil and resistor R2. Active filter voltage gain. In Common Emitter amps, the voltage gain is calculated as GV = RC/RE = 22K/390 = 56.4 = 35dB. The effect of feedback networks should be taken into account, reducing in practice the profit to 19dB. The feedback network from collector to base consists of resistance R6 470KΩ and R8 82KΩ to the ground (Inductor parallel to resistor R7 33KΩ, can be considered an abbreviation). The use of negative feedback in the transistor amplifier results in an overall reduced voltage gain and transistor input impedance with some improvements, such as stabilized frequency response and resistance to transistor changes. The Q2 output is connected to the 100K VR1 voltage divider, when the rocket foot is operating, the voltage gain provided by the active filter stage is adjustable, from 19dB to 1dB. 6. Starting stage. The final stage is the Emitter Follower used as a low-power impedance amplifier with approximately a unity overwhelm. The topology is almost the same as the input buffer. This block buffers the signal taken from the VR1 potentiometer wipers. The Q2 transistor is biased by the Resistor R5. The R10 resistor is the DC return for the Follower emitter. The R9 resistor in the collolate is attached to dampen the tendency to oscillation. The pedal output socket is taken in front of the variable VR1 resistor and does not affect the position of the foot pedal. The position of the potentiometer does not affect the output volume level. 6.1 Dunlop Cry Baby GCB-95 Output Impedance. Once again, the output impedance can be estimated using the hybrid-pi model, but in this case the formula is complex and does not give any intuitive idea. Alternatively, the value can be calculated using an accurate PSpice simulation giving a value of 5KΩ. The actual value ranges from 630Ω to 8.6KΩ (the position of the VR1 potentiometer affects the output impedance value), which can be considered a good output impedance. For more information, check the calculation of output impedance V847, which is the same circuit as GCB95. 7. How Dunlop Cry Baby GCB-95 works. The core of the wah structure remains in the C2 cover, which closes the feedback loop between the output (Q2 emitter) and the circuit input stage: The active filter phase amplifies the feedback signal from the Q2 emitter through C2 and R2. Because of this signal amplification used by the C2 capacitor, the apparent response seen by the input signal looking at the capacitor is different from the actual one. This apparent size of the C2 cap response depends on the amplification of the first stage signal, which is fixed by the position of the VR1 rocket pedal potentiometer: If the is in the lower position, Gain = min, Current through feedback cap C2 = min, Apparent response = max, Visible capacity = min. If the pedal is in the upper position, Gain = max, Current through the feedback cap C2 = max, Apparent reactivity = min, Visible capacity = max. The combination of complementary reactivity (L1 induction coil) will create a resonant circuit that is adjusted by tuning the apparent capacity of C2. Note: Element impedance can be expressed as Z = R + jX In ideal resistors Z = R (impedance = resistance [O]) In an ideal capacitor Z = jX (impedance = reactivity [O]) Capacitor reactivity: This is the capacitor's opposition to voltage change by it. The built-in electric field is resistant to voltage change between capacitor pins. (reactivity) XC = -1/wC (capacity). Reactivity is measured in Ohms, not Farads. Farads is a measure of capacity, an inherent property of the capacitor element. 8. Dunlop Cry Baby GCB-95 Modifications Wah. The Dunlop CryBaby GCB-95 can be modified in the same way as the VOX V847. 8.1 GCB-95 True Bypass Mod. This mod uses a 3PDT switch to bypass the entire circuit in a typical boutique pedal system. Removing the standard switch and installing 3PDT, you can do this before or after the input buffer stage, most people do this before the input buffer because it is easiest to do and backward. On the StinkFoot website, there is a great article about how to do True Bypass for the GCB-95. 8.2 Modification of Wah-Wah Q or Vocal Mod. The quality factor is a parameter that characterizes the way the selected frequency band is narrowed or distributed. The 33KΩ R7 resistor adjusts the sharpness of the resonant peak. This modification is also known as Vocal Mod, some users replace 33K with larger as 39KΩ, 68KΩ or even 100KΩ to have more vocal sounds. The chart above shows the R7 effect, reducing its value, the Q factor is reduced, and the filter bell spreads. 8.3. Modification of sweep range or Bass Players Mod. The C2 cap specifies the middle frequency of the wah sweep. Change C2 the entire range of the sweep of the wah moves up or down. In the images below, you can appreciate the offset of the sweep range by using 0.1uF, 0.01uF (default), and 0.001uF. Larger values move it down towards the bass, smaller values move it up. Basses like to increase the value (usually 0.068µF) for better wah bass response. 8.4. More bass modifications and boosts. The R4 resistor controls the amplification level of the signal. Reducing it will result in a slight addition of profit and bass content. In the figure below, you can see how smaller R4 values modify the frequency response: 8.5 More content modifications This subtle mod sets the content of the middle class. Increasing the value of the Resistor R2 heel position down will sound a bit tighter and emphasize. Emphasize. the values for this fashion are 2KΩ and 2.7KΩ (the default R2 resistor is 1.5KΩ). 8.6 V847 Wah-Wah Inductor. In all the antique pedals, there is some element that is often impossible to find/expensive, which somehow adds the best sound or legendary original tone. In this case, the Fasel coil from the first series is considered the holy grail. There are several options on the market for fun, everything with DC resistance from 10 to 200Ω (type 15O), and inductance from 200mH to 1H (type 500mH) can be used: Dunlop Yellow /Red Fasel, TDK, Sabbadius Soul Inductor, Coloursound Inductor, Wipple induktor, SOD inductors, miniature audio transformers and coils from industrial filters. 8.7 Buddha Bud-Wah Mod: Bud-Wah is basically a basic GCB-95 scheme with premium components and equipped with True Bypass. However, the sound of bud-wah against the standard GCB-95 is sometimes reported as sharper/sharper, where notes tend to get lost more easily. To improve the sound and get the Hendrix sound, change the 2 components: C2 (in GCB-95) = 0.022 uF = C5 (in Bud-Wah) – ok to go from .01 uF on the back side of the board. R7 (in GCB-95) = 20K = R5 (in Bud-Wah) - ok to go with 47K on the back side of the plate. Lowering the R7 acts as a voice mod (section 8.2), only going the other way with the R7, which found a sweet spot. The change allows for more original notes to go while maintaining a very lush wah. For those who want a standard sweep range with sound more like the current Bud-Wah, we suspect that changing the R7 to 20K and maintaining the sweep capacitor .01 uF will likely yield this result based on the results of the above mods. As additional information for builders, this is the equivalence of the parts between the GCB-95 and Bud-Wah: the GCB-95 Bud-Wah (rev. B) Rin1Rin2Rin3Rin4R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 Cin1Cin2C1 C2 C3 C4 C7 C6 C6

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