

From the help of Choky, on www.diyaudio.com, I prototyped my Aleph 3 to jfet conversion.

Whom ever would like to try a jfet front end conversion with specifically the Aleph mini, 3, 30 should be fine with a rail voltage of less than 30 volts with this front end. My rail is 26 volts with my amp drawing about 550 Watts for my Aleph 3. The j176 needs less than 30 volts to operate within its safety limit. This conversion used the j176, jfet which is rated more than the 2sj109 in mA, so I would use the higher values or less current with this jfet.

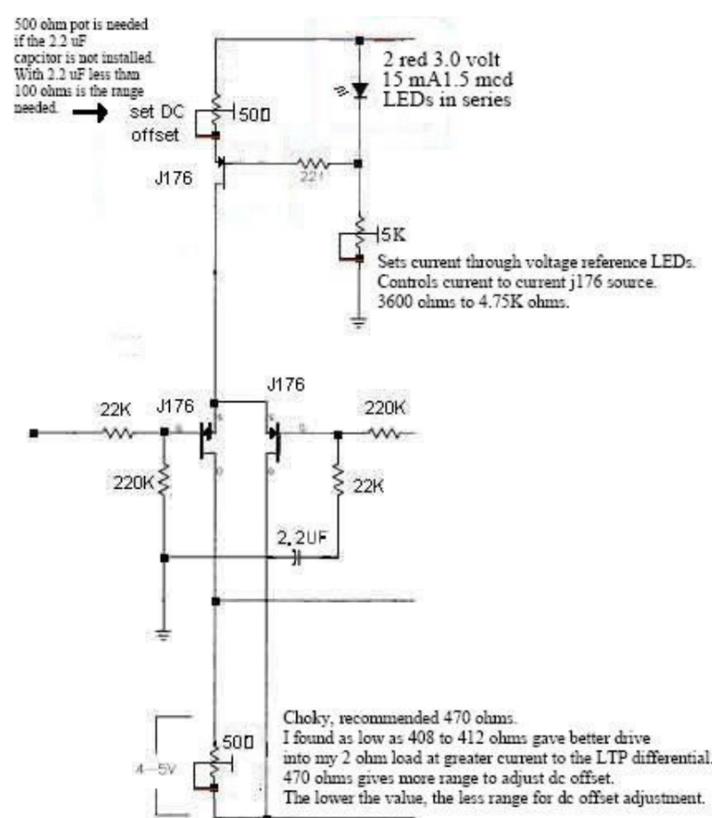
If your rail voltage is higher than 30 volts, the zvp3310a is a direct swap with just simply replacing the differential LTP and current source using all zvp3310a.

I have created this pdf to make things easier to describe what I did for future questions. This should be enough to know what I did and to experiment and have fun as I did trying out jfets.

This is how I converted my Aleph 3 to a j176 front end with the help from Choky on the Diyaudio Pass forum.

I used a matched pair of j176 for the differential LTP. Matching can be found on Nelson Pass's diy articles for further information. I believe www.passlabs.com has a link to his articles on matching and calculating the current needed.

Here is the schematic to try out that Choky provided for me to get me started, but I modified it to this latest final version:



I just used 1 variable 10 turn 500 ohm pot where above Choky called it DC offset adjustment. I placed the 500 ohm 10 turn pot in the 221 ohm resistor's position. This is very important to get the DC offset low enough with the j176. It might start out at .5 volts, so without that adjustment, the amp will not be safe for your speakers.

I found I needed somewhere between 20 to 80 ohm with the 2.2 uF capacitor installed shown above. Each channel was different due to how well the j176 were matched.

Btw, the zvp3310a will need a higher value, if you use them instead, so I found a 500 ohm variable 10 turn pot is a good range to use, especially if you leave out the 2.2 uF dc coupled capacitor. You will need this pot to try and in each case the value will be different depending on how well the j176 or zvp3310a were matched.

Simply, measure the DC offset while turning the pot slowly to get the DC offset to a safe value less than 100 mV.

The 470 ohm resistor, above, I found did not work with my set up to optimum sound quality. It sounded nice, but I found a better improvement by placing in a 500 ohm pot in place of this 470 ohm resistor. In the original Alephs that value was 392 ohm. In my setup I found about 408 to 412 ohms, worked better with my very hard biased Aleph. I have my bias resistor removed so that it will bias as hard as the mpsa18 will run the outputs. It draws close to 550 Watts, so it needed a fan to keep the heatsinks below 50 to 55 Celsius. Next time, I will use double the heatsinks and keep it fanless.

Also, replace all of the resistors above to the new values.

The 2u2F or 2.2uF film capacitor keeps the RC values constant at those higher resistor values.

I found the amp does need a compensation .001uF caps on the base to collector of the mpsa18 where some of the Alephs have them installed. I also needed a 10 pF compensation cap to get my square wave to lookd good at 1K and 10K Hz waves bypassed over the 220k feedback resistor as in the original Aleph schematics.

I also replaced the 220uF capacitors with nonpolar electrolytic 50 volt capacitors. Those seemed to sound a lot better than the polar from listening tests.

Be careful when installing the j176. Look up their pin values to make sure you know Gate Drain and Source and put them correctly into the circuit. Be careful, because their leads are so small, sometimes the solder will not connect them to the double sided circuit board etc... Check them with a continuity checker. The safest way to try this mod is first try the current source with the j176. If the amp still works fine, then try the differential next. With this j176, as a current source, the former 9.1 volt zener voltage reference did not pull up. I found instead using 2 red leds worked well and are much quieter than the zener. No bypass capacitor is needed with the LEDs. They are very low noise and easy to use. Make sure you install the right polarity or they will not glow, so you know it is installed backwards. It sounds very nice and seems to regulate fine on the DC offset output really fast with the LED reference. I would guess less than 1/10 of second for the DC offset to jump well below 100 mV.

Good luck in trying this out. Regards, Bill
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