Subject: Magnatone Model MP-3
Posted by Stratcat on Wed, 18 Jan 2006 21:59:43 GMT
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Hi--This is a mid sixties two twelve combo amp. Power tubes (2) are EL34s. The schematic for this amp shows 400v at terminal A of the power cap can, 340v at B, 220v at C, and 140v at D. I'm getting 502v at A,425v at B, 289v at C, and 284v at D. I can get only get the amp to bias correctly by greatly reducing the 22K bias resistor. The power transformer runs cool, but I'm wondering if it's shorted. Would it be okay to reduce the voltage using a zener diode in this case? Thanks for any info you can give. Stratcat

Subject: Re: Magnatone Model MP-3
Posted by Thermionic on Thu, 19 Jan 2006 06:40:25 GMT
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Howdy Stratcat,It sounds as if what's going on here is caused by two problems. One, the AC line voltage. Back when your amp was made, the U.S. line voltage was only 110 - 115 volts. Now, it's around 120 and frequently as much as 125 in places at certain times of the day.Two, the rectifier tube. I'm not familiar with this particular Magnatone, but I assume it's tube rectified. If it has the improper rectifier tube, the voltage can be very high, especially considering the higher line voltage on top of it. If it uses a 5U4 and say, a 5AR4/GZ34 is being used, that alone will account for around 40 volts of the excess voltage.Almost certainly, some of the carbon composition power supply resistors have drifted in value over time. Drain the filter caps by turning the amp off while playing at high volume, and strumming your guitar until the sound totally fades away. Check the values of every voltage dropping resistor in the power supply. If it's like most Magnatones, it uses 12DW7s for the vibrato circuit. This tube, also known as a 7247, is a 12AX7 in one section and a 12AU7 in the other. People frequently substitute 12AT7 or 12AX7 types for them, and while they will work, performance will be poor. Make sure the tubes are correct. Improper types here can also cause slighty higher than normal power supply voltage at certain points. The 12DW7's "12AU7" section draws a lot more current than a 12AT7 or especially a 12AX7, and the improper type's lower current draw will not drop as much voltage across a given resistor.These are some things to look for initially. If you can get the voltage pretty close to what it should be by trying these things, then what's left is because of higher line voltage. Tweak it down to the correct value by first biasing the amp, and then measuring the voltage dropped across the first power supply resistor. Use Ohm's Law to calculate the current draw through that resistor, and then replace it with a higher value that will render the right voltage. Voila, good as new! Since the power transformer runs cool, the voltage is too high, and you didn't note that the amp hummed, the filter caps are hanging in there. But, you may wanna replace them soon if they are very old. Plus, the super high voltage you're seeing right now can fry them.I hope this helps.Thermionic

Subject: Re: Magnatone Model MP-3

Posted by Stratcat on Thu, 19 Jan 2006 11:37:39 GMT
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Hi Thermionic---Thanks much for your reply. I will check out the points you mentioned. I wanted to let you know that the amp has no rectifier tube. I checked the diodes on my meter and they all showed good. Should I just replace them? Also, the power cap can is a brand new unit with the same values as the original. Thanks, Stratcat

Subject: Re: Magnatone Model MP-3
Posted by Thermionic on Sat, 21 Jan 2006 02:17:36 GMT
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Howdy Stratcat,Cool that you've replaced the can cap. The rectifier diodes are most certainly germanium diodes that are horridly noisy, especially by now! If I'm not mistaken, Handmade Electronics still has some Philips BYV96E HEXFRED diodes, which have been discontinued. They are definitely superior to 1N4007s, but also much more expensive. It's very difficult to find axial leaded HEXFREDs nowadays. All are TO-220 case style. 1N4007s will work just fine in a pinch however, and they are still better than the vintage types.The problem with replacing the rectifier diodes is that the voltage will be even higher, as modern silicon diodes have lower forward voltage drop than vintage germanium types. So, you'll first have to fix your voltage problem and change diodes before adjusting the first power supply resistor value.Let us know what the voltage problem was when you find it.Thermionic