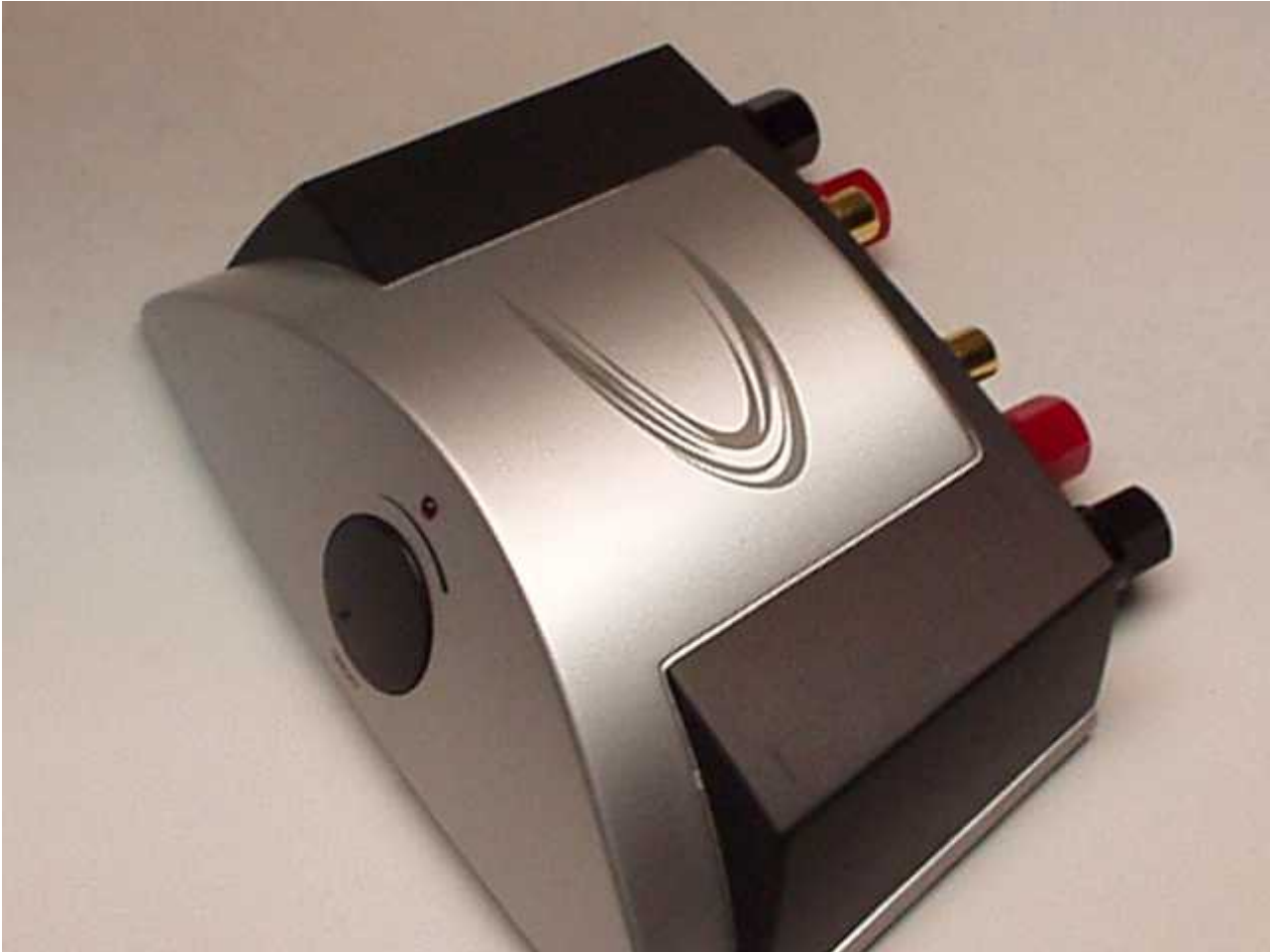


The Wayback Machine - <http://web.archive.org/web/20051223124039/http://home.pacifier.com:80/~gpim...>

Dinking around with the Sonic Impact 5066 Tripath digital amplifier...



Lately, there has been a lot of noise on the web about the Sonic Impact 5066 class T digital power amplifiers. The Sonic Impact is a cheap little battery powered portable amplifier designed to be used with portable music sources like CD players and MP3 players and have enough power to drive "normal" speakers.

The SI 5066 uses the Tripath TA2024 IC. The TA2024 can deliver close to 5.5 watts into 8 ohms and close to 9.5 watts into 4 ohms at low distortion when running from a 12 volt power supply. In the SI 5066 the internal power supply consists of 8 AA batteries and a 330uf capacitor. There is a provision for running the amplifier from an external 12 volt supply. When you plug in an external supply the internal batteries are disconnected to protect them from getting charged.

The big surprise of the SI 5066 is the good sound quality they have even in stock form. The SI 5066 even got a review on the 6 moons audio site. [6moons review of the Sonic Impact 5066](#)

Lots of folks on the web have been doing various mods to these amplifiers. One of the more common mods is to remove the circuit board and install it in a larger case with high quality input and output jacks and an improved power supply. The word around the web is the sound improves noticeably when the power supply is improved. The SI 5066 just looked like a lot of fun to play with.

Links to some other modified SI 5066's

[Rick's SI 5066 mods](#)

[Another SI 5066 modification/recase](#)

I purchased a SI 5066 from Parts Express for \$29.87 plus shipping. [Parts Express home page](#) When the SI 5066 arrived I loaded it up with batteries and connected it into my system. To get it connected into a normal stereo system you have to use adapters. The input requires a stereo RCA to 3.5mm mini jack. On the outputs I used a set of adapters from another project. These adapters are just a 1" piece of wire soldered to a banana

jack. The output adapters make it possible to connect my speaker wire to the cheesy spring terminals on the back of the SI.

After a few hours of playing the sound opened up and started sounding pretty nice. Bass was weak but the midrange quality was quite nice, especially when you consider how little the SI costs.

Not being one to leave things alone the SI got introduced to my test bench for a look see. The case top is easy to remove. There are 2 small screws in the bottom of the battery case and 4 larger screws under the stick on feet. While on the bench I was trying to make some measurements and trace out the circuitry of the input circuit when disaster struck... Not taking enough care with probes that are way too big for probing SMT boards I shorted something out and blew the input of the chip. I should have known better as I have many years of SMT troubleshooting and repair under my belt. The really stupid thing is in the tool box about 8 feet away is a couple of pair of nice fine probes that work great on SMT boards.

So, an new opportunity arises... Not being able to do any electrical testing on the now dead SI I decided to map out the mechanical modifications I want to make while waiting for the next pair of SI 5066's to arrive from Parts Express. After some thinking the decision was made to see how much improvement could be made while keeping the original case.

After studying the mechanical and electrical packaging the list of improvements I feel are necessary goes like this...

1. Improve the power supply.
2. Install binding posts for the speaker connections.
3. Install RCA connectors in place of the 3.5mm stereo jack.
4. Remove the input volume control and connect the inputs directly to the board.
5. Move the power switch to the rear of the unit.
6. Replace the input capacitor with a higher quality cap of sufficient size to fix the weak bass problem.
7. Reduce the gain of the SI to fit my systems needs.

Improving the power supply as well as upgrading the input and output connector speaks for itself.

I have no need for the volume control. My system has a high quality transformer volume control in the passive preamp. When running the SI in the system the SI's volume is set for max and the passive pre controls the gain. Another issue with the stock volume control is noise pickup. The main power supply is very noisy as this is a switching amplifier. In the SI none of the audio connections in the input circuitry are shielded. To make things worse the 12 volt power supply runs all the way up to a switch on the back of the volume pot then back to the board.

Moving the power switch to the rear of the unit will allow the signal path and power supply path to be somewhat isolated. I plan on cutting some runs on the board to remove the loop that the 12 volt supply makes to the front of the unit and back. Keeping the power supply away from the input of the amplifier chip and using shielded cable from the RCA's to the chip input should help these issues.

The input signal capacitor is a ceramic capacitor that is too small for the job. Being too small and ceramic are both strikes against the stock cap. At this time the plan is to use Black Gate BGN 4.7uf caps for the input duties.

The gain of the SI is too high for my system. I'm going to replace the gain setting resistors with the value that Tripath shows in their application data. This will reduce the gain almost 6dB.

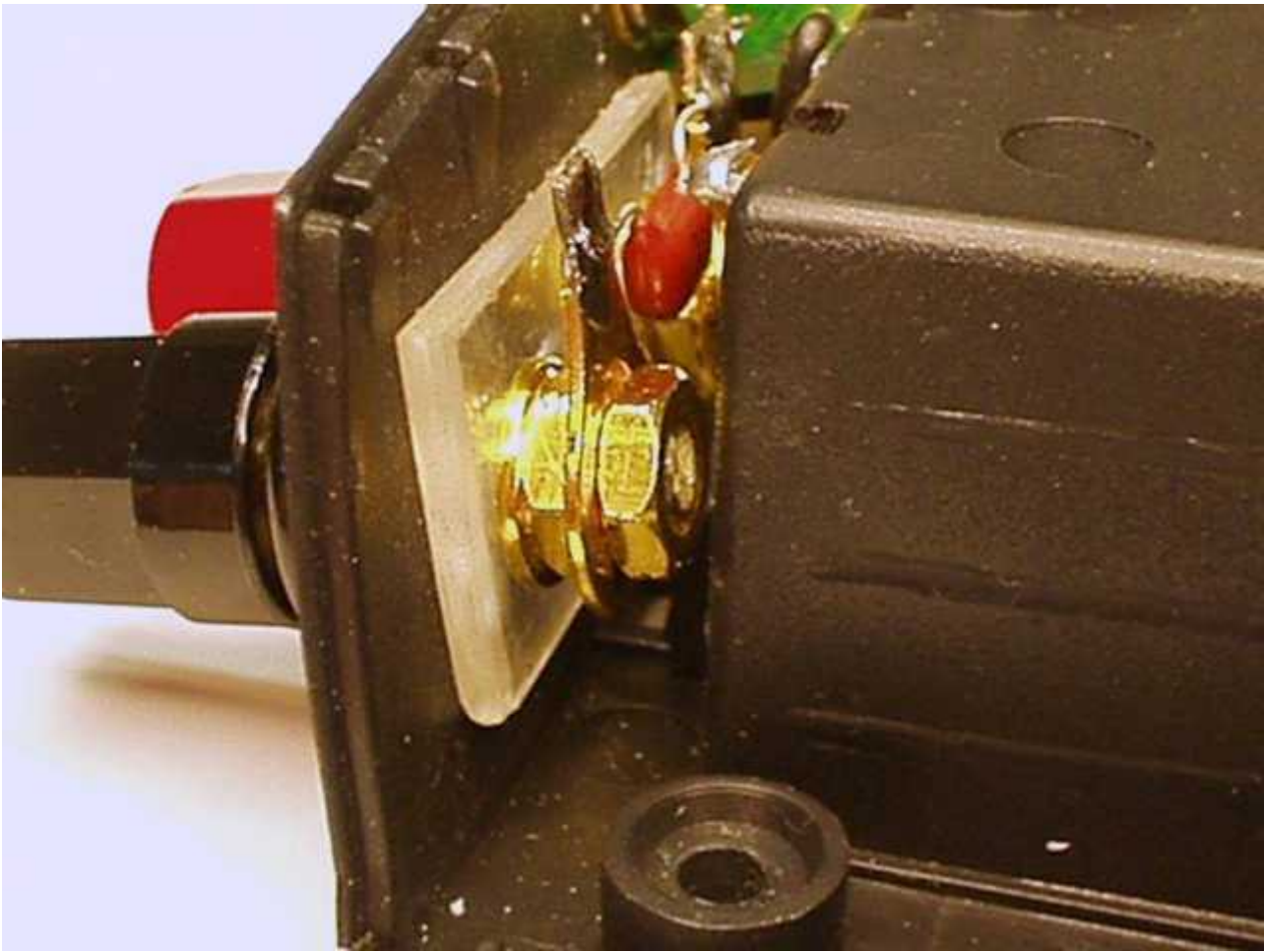
Here are the mechanical mods that have been done so far. Not much left to do as I wait for the next pair of SI's to get here.

The rear of the SI with the RCA's, new power switch, and binding posts installed.



A close-up of how the binding posts are installed. The base plate that came with the binding posts was too thick to fit so base plates of a thinner plastic were made. The connectors for soldering the leads to are the 16ga speaker cable crimp connectors from Radio Shack with the ends cut down some. 10mm of the binding post had to be cut off to clear the battery boxes. Getting the washers, nuts and terminals installed is a real test of patience. Tools used were needle nose pliers, dental pick, and fine tweezers.

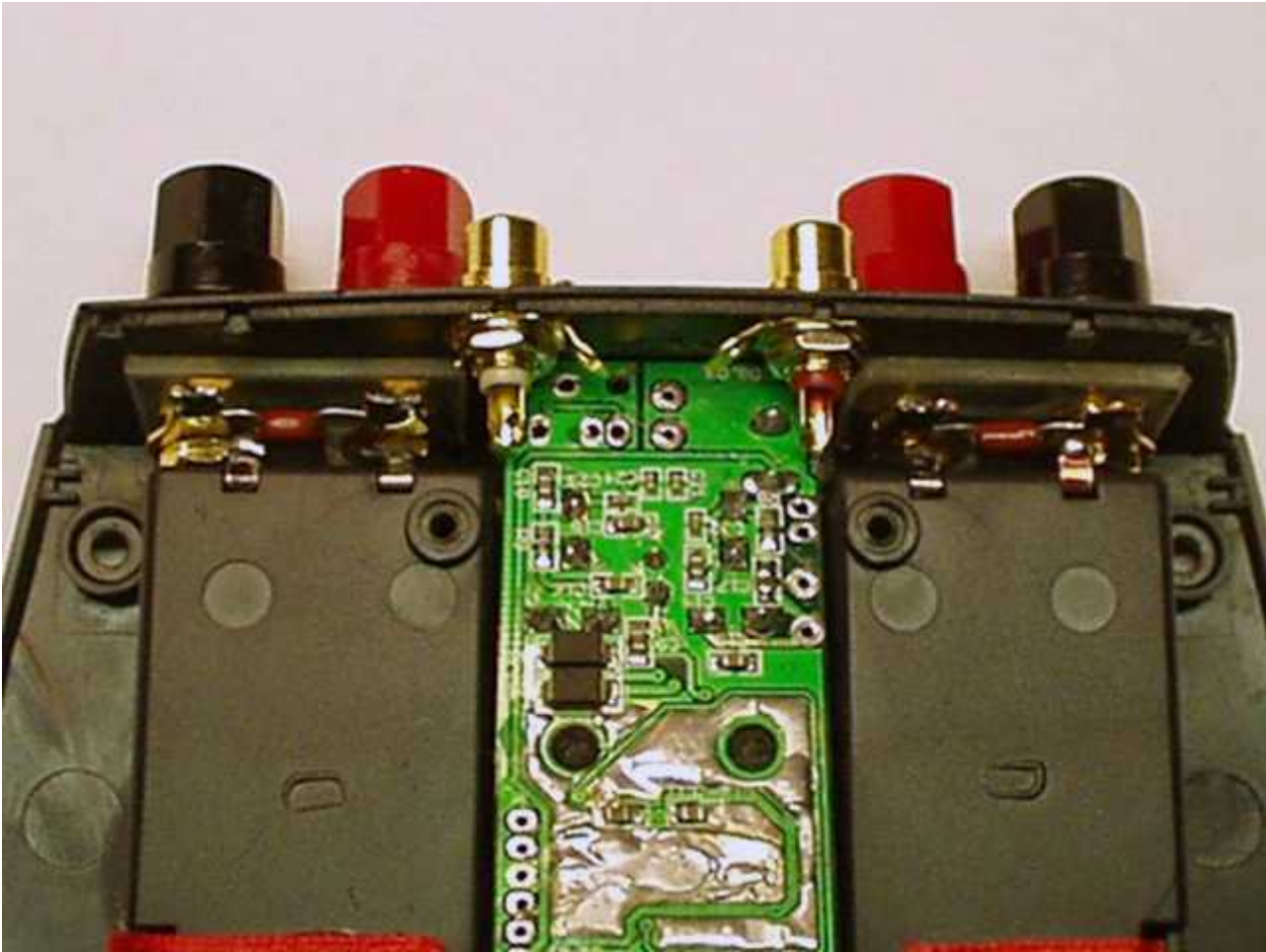




Here is a view showing the RCA's over the board. There is only 2mm's to spare! The ground rings have flats cut in them to clear the board on the bottom and the case on top.



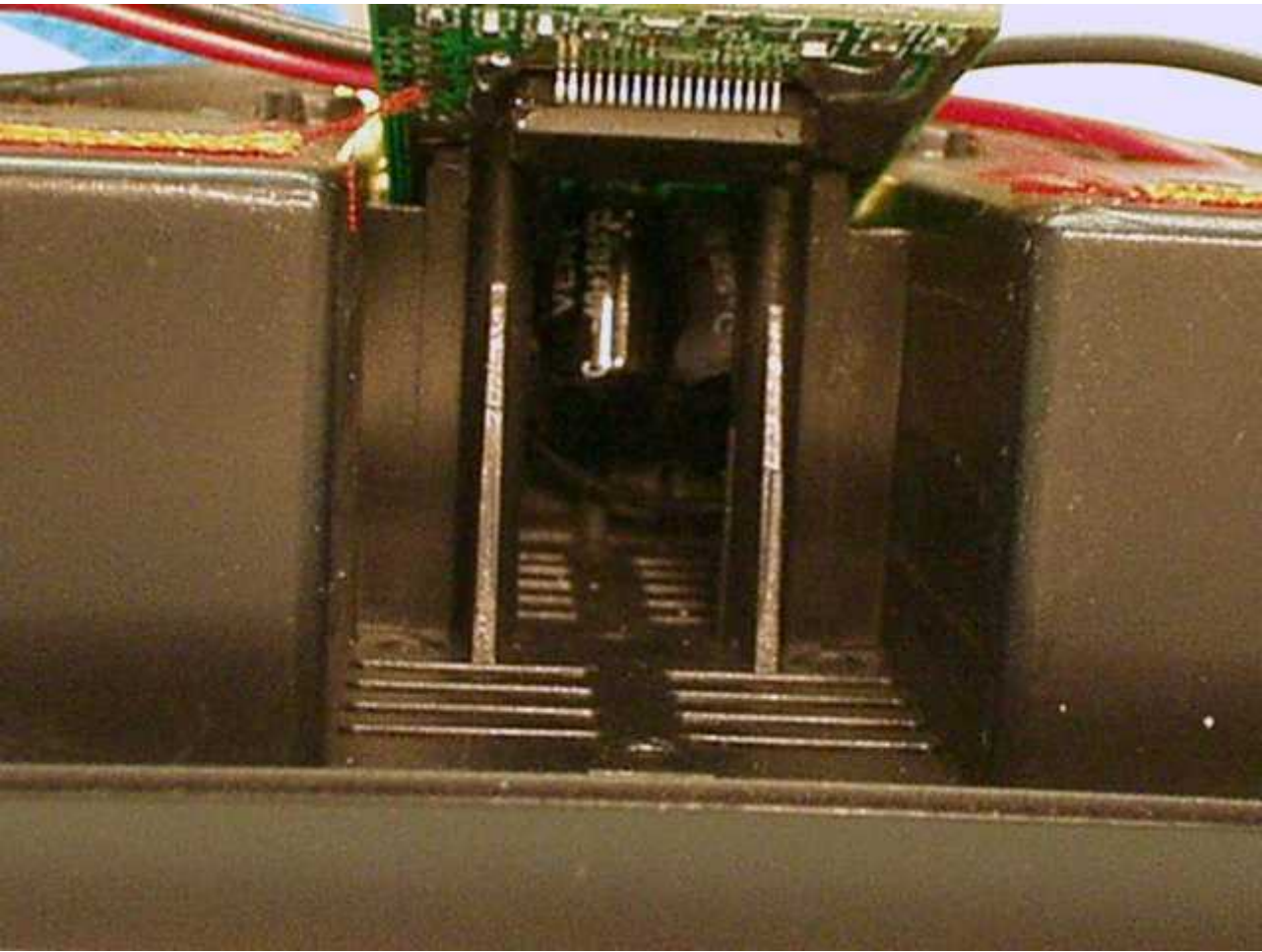
Another view of the inside looking towards the rear.



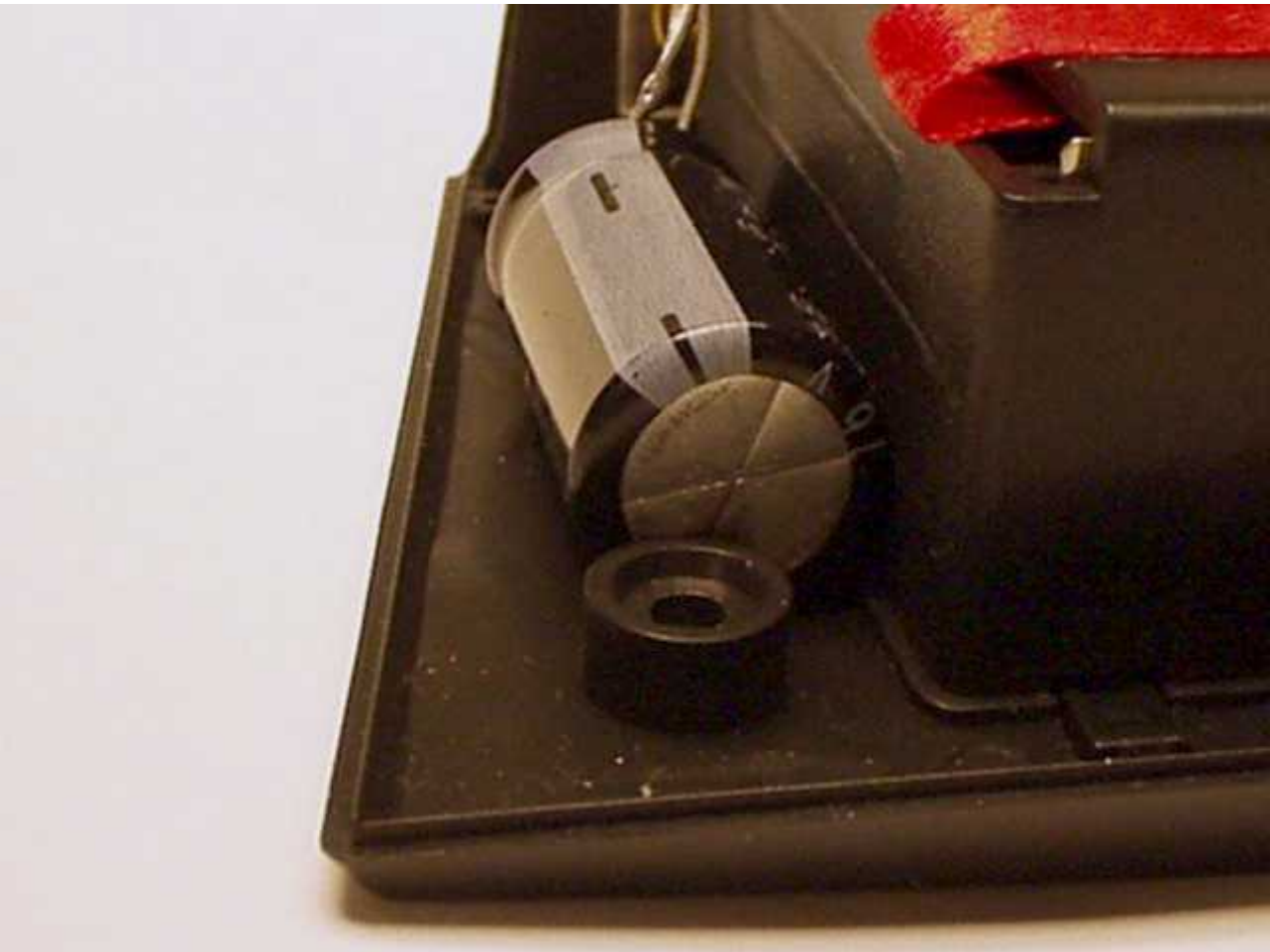
For the power supply improvements the 330uf cap on the board will be replaced with a 1200uf Panasonic FM series cap. The 1200uf cap is a 10mm diameter cap where the stock cap is an 8mm part. There is enough lead length on the output filter inductors to raise the inductors up off the board then push them sideways enough to make room for the 10mm cap. The space vacated by the volume pot is big enough to put a pair of 3300uf Panasonic FM caps (12.5mm x 35mm) on the bottom and another pair of Panasonic 2700uf FM caps (12.5mm x 30mm) on top of the first pair. On the outside of the battery compartments there is enough room to put a pair of Panasonic 4700uf FC caps (16mm x 32mm). This will boost the power supply up to 22,600uf of high quality low ESR caps compared to the 330uf low performance cap that comes with the stock unit.

4 caps should fit in the space vacated by the volume pot.





One cap added to each side of the amp will add lots of energy storage.



That's about all I can do until the next amps get here.

