

ADDITIONAL COOLING FOR EB104 2KW 6M SOLID STATE AMP



In August 2021, I purchased a 2kw solid state amp from EB104 for use during portable operations. The goal is to provide 1500w output on digital modes such as Q65, that are full duty cycle up to 50 seconds. In order to accomplish this, sufficient airflow must be assured.

The amp comes with 1" diameter rubber feet only .5" high, restricting the volume of air that can be sucked into the 3.875"x7.375" air inlet on the bottom panel of the amp. Additionally, the two exhaust fans on the rear panel of the amp (ID-Cooling PL-12025) together only provide a total maximum rated airflow of 142.4 CFM. The goal was to increase the ventilation area underneath the amp and also add fans to pressurize the amp, thereby decreasing the back pressure on the rear panel fans and increasing the cooling airflow through the amp.

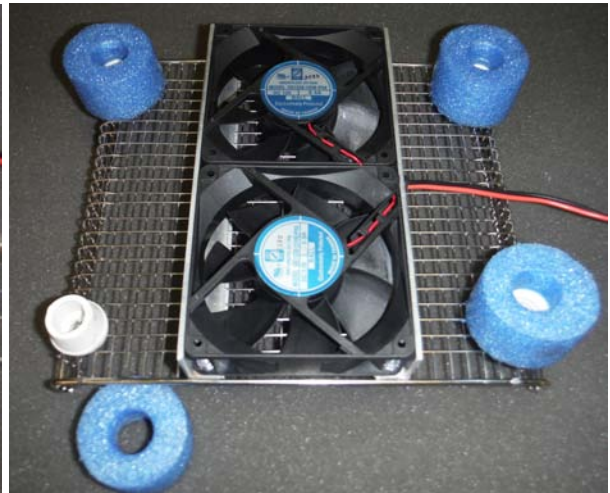
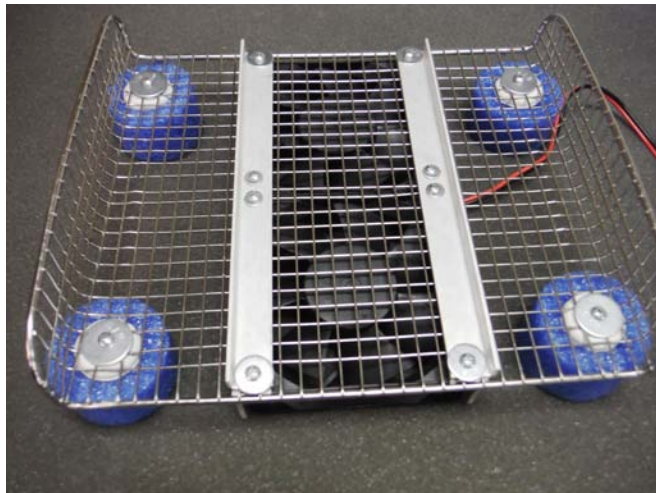
Two Orion OD1238-12HBIP68 square 120mm fans were ordered to place under the air intake. Each 6 watt fan is rated at a maximum of 124 CFM airflow and is 1.5" thick. The pair of fans fit very neatly between the outer rails of the Zulay Kitchen 9.75"x14.75" "baking and cooling rack" (ordered from Amazon) as well as the small lip between the front and rear panels on the bottom of the amplifier.



The two rails used to form the feet of the standard cooling rack were cut off, just leaving the bare rack. Each end then was bent down to provide sturdy support for the rack 1.75" above the desktop, while still permitting good airflow in from all sides. I don't have ready access to a metal brake to bend pieces such as the cooling rack, so I just placed the rack between two pieces of steel angle in a vise and bent it that way.

Four rubber leg tips for .75" diameter table legs were purchased at ACE Hardware and snipped off so they were only 1" high. Each was mounted on the rack using screws and fender washers, so they aligned with the feet on the amp. 1.5" spacer rings were cut from a plastic swimming pool "worm" 2.25" diameter with a .75" central hole. These provide alignment of the amp with the rack, and the weight of the amp is able to compress the spacers slightly so the plastic fans fit tightly against the bottom panel of the amp.

Angle aluminum was used to secure the fans on both sides of the rack and keep the top of the fan assembly straight and smooth and ensure rigidity of the rack. The photo below shows how fender washers and screws with nylon insert lock nuts were used to secure the rubber feet onto the rack. For correct alignment, some of the cross welds on the rack had to be broken so the grid could be slightly bent to accept the screws in the correct locations.

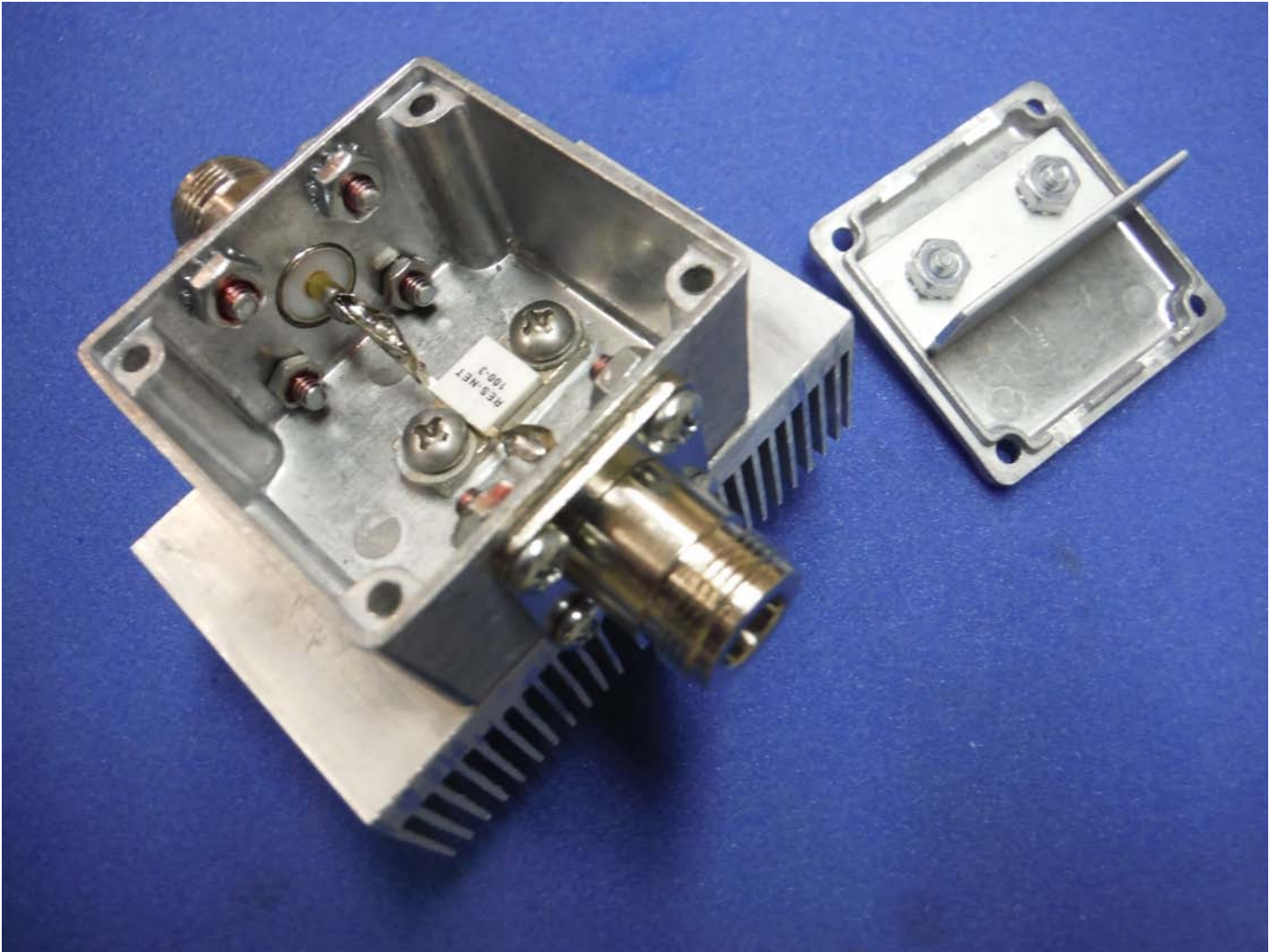


A rubber grommet in one of the aluminum angle pieces was used to pass the 12 VDC line to the fans. Because the fans are so tightly secured by the angle aluminum, they only needed to be fastened on the rack end, and simply butt against the bottom of the amplifier to fit tightly against it on the top end. I just used angle aluminum that I had on hand – it would not need to extend up to within .125" of the top of the fans, as it does in my particular configuration.

Lance Collister, W7GJ, August 5, 2021

3 dB ATTENUATOR FOR USE WITH EB104 6M AMPLIFIER

The FT-857 that I am using to drive the EB104 amplifier produces a full power RF spike at the beginning of each transmit period. The EB104 amplifier calls for no more than 60w drive, and the FT-857 has a maximum output of 100w. In order to prevent overdrive of the amplifier, I built a 3 dB attenuator, using a 100w 3dB chip from Henry Radio. The attenuator is shown below.



In order to run 1500w output in Q65-60A mode, I run the EB104 amplifier on 53 VDC and drive it with 23 watts. The FT-857 is set for an output of 46 watts into the attenuator, which easily dissipates the 23 watts. It also limits any full power RF spikes to 50 watts, which is safely under the maximum allowed drive of the EB104 amplifier.