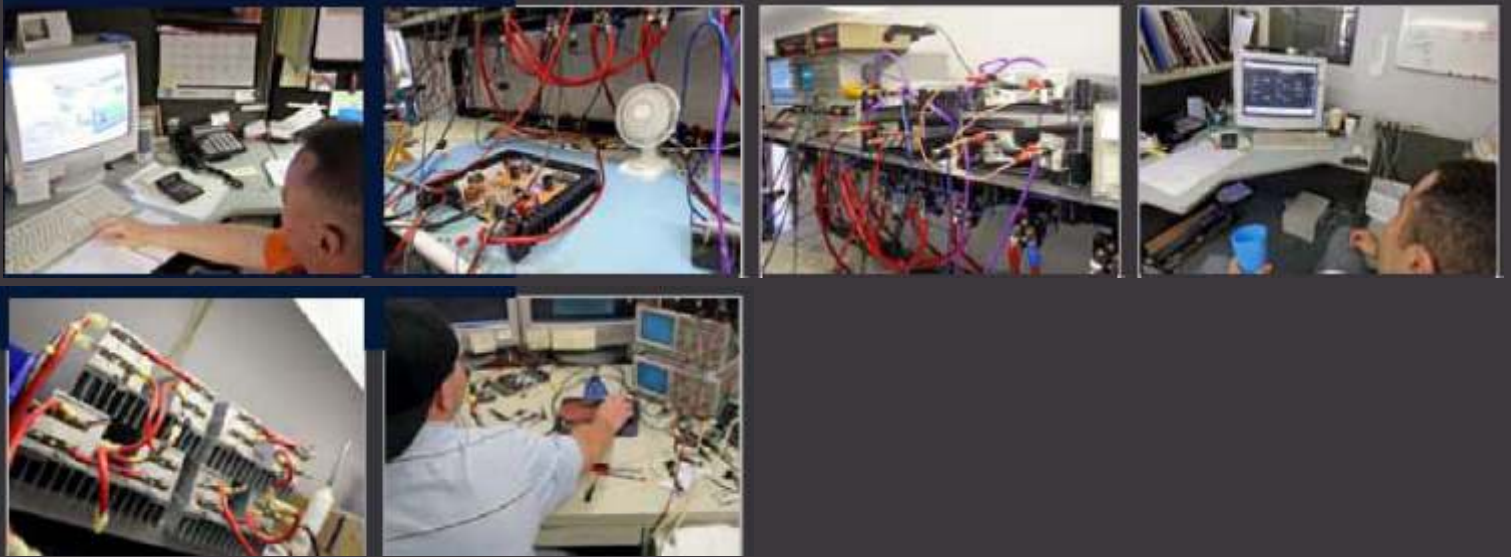


Rockford Fosgate has been at the leading edge of amplifier design since the seventies, and has no plans on changing that heritage of innovation any time soon. We got a chance to go behind the scenes and take a peak at their amplifier manufacturing works, where all the new amplifiers are being designed and tested and built.



An amplifier consists of a two basic parts, a circuit board and a heat sink. The first step in building an amplifier is assembling the circuit board by placing all the electronic components onto it. This is the process that takes the most amount of time, and is probably the most difficult part of building an amplifier.

The first step in building a circuit board is taking the "raw" circuit board and attaching the parts that can be attached by high speed robotics. These components are usually relatively small in size (from the size of a grain of rice up to about the size of an aspirin) and are attached by computer controlled machines to the surface of the circuit board (as the name implies). The surface mount components come in rolls containing thousands or tens of thousands of parts. On the back of each component is a small amount of dry solder that temporarily holds the component to the circuit board.

The machines used to place the components onto the board consist of a number of robotic arms that pick up each electronic component and rapidly place them onto the surface of the circuit board. They have a number of these machines, with the newest machines being able to pick up 16 pieces at a time before reloading. Because of the number of components in a typical amplifier (and the limit on the number of components each machine can place) a circuit board will generally pass through several machines to get all the surface mounted components mounted.



The next step is passing the circuit board through a computer controlled oven (it slowly heats up the circuit board to melt the solder that is on the back of each component) to attach the surface mounted components. Once they are attached it slowly brings there temperature back down again to prevent any kind of thermal shock to the components, which can be caused by rapidly heating them up and then rapidly cooling them off again.



After these components are mounted and baked onto the circuit board, the partially finished boards are taken to another area of the building. You will find employees there which “stuff” the boards with all the electronic components that are too big or complex to mount to the board using robotics. This includes most of the bigger pieces inside of an amplifier including capacitors, transistors, power & speaker terminals. Rockford Fosgate has perfected their process by taking steps to make sure that they make a great amp first time every time.



Once the circuit board is completed, it is attached to a template and run through a wave solder machine. The components that mounted to the circuit board by hand require soldering to get them attached to the board. The Machine has a conveyor belt that passes the finished board over a pool of molten solder. As the circuit board passes over the molten solder, the components suck up enough solder to attach the components to the circuit board. Very simple and incredibly quick when compared to the old way of doing things and it virtually guarantees having great solder joints every time (which is a critical factor in making reliable products).



After the circuit board emerges from the wave solder machine, the amplifier is almost done. All that is left is to mount the circuit board into the raw heat sink, test the amplifier, complete final assembly and wrap it up for shipment ready for the end user.

The illustrations show how mounting the amplifier to the heat sink is done. They use a pneumatic screwdriver. Each screw that is placed in an amplifier is mounted with the right amount of torque to ensure that they do not loosen over time and are at the same pressure to ensure that no screws are stripped or components are damaged from over tightening. The process is very repetitive so to prevent injuries they put the air driver on a retracting cord so that the technician isn't holding the full weight of the screw driver all day.



Every amplifier is tested to make sure that it works flawlessly and exceeds rated specs (all of the Rockford Fosgate amplifiers will make power than they are rated at ,some even do twice as much and even more)! The first step is to mount it to a testing jig(this allows the technician to quickly attach the speaker and power leads without having to actually loosen and tighten all the screws, instead they clamp onto the connecting terminals from the top down). Only once the amplifier has passed a battery of tests (including running the amp at full power) will the testing station print out the birth certificate that all Rockford Fosgate amplifiers come with. This birth certificate tells you who inspected the amplifier, the date it was made, how much power it made etc. As soon as they finished testing the amplifier and it passes, they finish assembling it by putting on the cover plate



Once they finish adding the components, they place the amplifier in a shrink wrap bag, place it in an oven to shrink the wrapping and then box it up. They attach the label that prints out at the time that the amplifier passes with power output, serial number and model number and attach it to the finished barcode. From here the finished product goes directly to their warehouse, before it ends up in some lucky person's vehicle.



Here is a look at a Power-TI5004 being assembled (the same process pretty much applies for all the amplifiers made at this Rockford Fosgate plant). This is the. Flagship 4 channel amplifier of the line, measuring almost one meter across. Why would anyone use a big amp like this? Because they can!



A Punch 75 25 to Life amplifier in various stages of assembly and testing. The original Punch45, Punch 75 and Punch 150 were originally released in 1980 and were one of the most popular amplifiers of all time, with a number of them being used to win world championships at all levels in the car audio competition arena in 2005, to mark the 25th anniversary, Rockford released a limited edition anniversary edition commemorating the originals. .

