



Rotel background

Since our beginning in 1961, Rotel has gone against the grain by remaining a family owned business. Company President and graduate engineer Bob Tachikawa is the son of the founder, and has been careful to keep Rotel focused on the art of making only fine audio and home theatre equipment. With a total employee count of around 200, we are small enough to keep quality high, but large enough to handle production requirements. Our planning and research facility, located in Britain for many years (a country known for its audiophile pursuit of perfection), is where much of our design and engineering takes place. Our Rotel Team factory is located just north of Hong Kong China where the majority of our products are manufactured by us, to our own standards.

More important than where something is made is *how well* it is made. All Rotel products are truly built from the inside-out, using premium parts from around the world, selected for their sound quality, and often hand inserted. Rotel engineers are, first and foremost, music lovers who labor over their designs like proud parents. They listen to the results, and tweak and adjust the product to meet the team's exacting musical standards. Only then does production begin.

The quality does not stop at our parts or critical evaluation. Inside our products, we keep the circuit paths as short as possible to reduce the chances of spurious emissions and unwanted leakage. We also keep each channel's signal path identical to the others for best imaging and soundstaging. Even our grounding techniques reduce potential loops that might produce hum.

Rotel's reputation for excellence has been earned through hundreds of rave reviews and awards from respected reviewers who listen to music every day. Hardware is secondary to these seasoned veterans; faithful reproduction of the original performance is their standard of measure. The laurels bestowed by these keen ears have kept us true to our goal in the pursuit of hi-fi equipment that is musical, reliable, and affordable.



Why do we do what we do here at Rotel?

This will be a short treatise on the various aspects of Rotel design principles, and the rationale behind some of them. This will not verge on rocket science but it will explain some of the aspects of our quest for excellent sound reproduction.

In the beginning was video. Roland Electronics started 46 years ago as an assembler of Sylvania TV sets for the Japanese market. This name could not be trademark protected worldwide, so a decision was made 40 years ago to change the company name to Rotel. A decision was also made to shift from video to audio manufacturing.

The desire to produce hi fidelity (mono) products led to Rotel becoming involved with OEM manufacture for some very famous American companies. As a result of this Rotel was one of the very first companies to make receivers. This led to our own line of products becoming famous worldwide, with one of our early receivers (RX-402) picked as a Best Buy in 1972 in a US consumer testing magazine that will not allow its name to be used in advertising. We repeated the following year with the RX-403. In the 1980s we won more Best Buy and Recommended awards in the UK than all other manufacturers combined! We now move to the present day.

We manufacture our own CD players, integrated amplifiers, preamplifiers, power amplifiers, surround processors, tuners, cassette decks, speaker switchers and other items. We have very strong views of how music should be reproduced, and this is reflected in our circuit designs and parts selection processes. This has been an area where we have consistently developed better products, shown by the many awards from magazines, reviewers and consumers worldwide for the excellence and value engineering inherent in our products.

Let's talk about some of our design concepts now. We began designing Symmetrical Circuitry into our amplifiers 19 years ago. This is done to keep the signal path the same length for both channels. Why? The reason is simple but absolutely vital. If the circuit path is the same length then the inter-channel timing of the two (or more) channels will remain intact. This is easily understood but many people fail to appreciate why we do this. If the channels have different length circuits and different time lengths for signal propagation then the stereo image is affected by the change in apparent timing between the channels. This can hardly be called faithful reproduction. We wish to preserve and reproduce the signal as accurately as possible. If the timing of the signal is important, and we believe it is, then the signal must be amplified by an amplifier that has Symmetrical Circuits.

The heart and soul of any circuit must be the power supply. We are very strongly in favour of Highly Regulated Power Supplies for our equipment. There are some companies that market designs producing high power outputs for short periods of time. We feel these are poor power supply designs as the circuit will have difficulty if the musical demands are continuous, and require more than a small amount of power for more than a small fraction of a second.

Rock and roll music would be an example of the type of signal that has high power demands for long periods of time. Much of the music in this category has been compressed in dynamic range to enable the sound to be continually loud-sounding. Power Rock, Heavy Metal, Rap, Music Videos and movie soundtracks are all capable of heavy, continuous demands on the power supply. If you design a circuit with a highly regulated power supply it will have the power reserves available at all times for the music. All you need to do is decide how much power will meet your needs, and buy the correct amplifier for your application.

An added benefit of this type of circuit design is that the power supply will help the amplifier achieve a higher damping factor. This leads to better current drive capability at low impedance levels, and better control of the speaker by the amplifier. The Rotel RB-991 power amplifier was tested by *Australian Hi Fi* magazine as being able to **produce more than 200 amperes of current**. This is clearly ample power reserve for difficult music and inefficient, low-impedance speakers.

Many of our power amplifiers and integrated amplifiers use Toroidal Power Transformers. We use these for their inherent efficiency, and their characteristic of being quieter due to reduced magnetic leakage from their round shape. This makes it easier to reduce hum and noise in a circuit. They also provide more power in less space than the common "EI" type transformer. One mass-market hi fi manufacturer has begun to utilise "R" core transformers and has made many claims about these in the specialist UK press. Rotel utilised these in our designs 25 years ago, and we feel they are markedly inferior to a toroidal transformer. We did find them to be useful in low power circuits to save money, but not to improve sound. Our transformers are designed and manufactured by us to very exacting standards.

During the final phases of design we audition the sound quality of our products. We then begin the process of tuning the circuit for the best possible sound quality. We choose resistors, capacitors and even transformers by this time consuming process. We believe that low distortion and excellent specifications are essential, and also that some components have intrinsically different sound signatures. Rotel chooses the finest available for the money, at all price levels. We call this our Balanced Design Concept.

We choose the finest parts available for the circuit for each price point and attempt to achieve the highest level of performance at all price points. Our RA-931 is an excellent example of a fine amplifier that provides great musical performance at a very reasonable price.

We have chosen to manufacture with Roederstein metal film resistors in many of our designs. These are chosen for their low noise and low distortion characteristics, which allows us to have quiet clear circuits. We frequently use slit foil capacitors from BHC Aerovox, made to our exacting specifications. A slit foil capacitor has a lower Equivalent Series Resonance (ESR), and is inherently faster acting internally. This helps us to have

amplifiers that will respond to fine nuances as well as having the speed to create the demanding transient from musical or movie sources. We choose Alps volume controls for their consistency and low noise, as well as their noted reliability. We make our cabinets from heavy gauge metals to ensure structural strength in all of our designs. Our finish is noted as consistently excellent. We use high quality PCB boards in our designs, including glass fibre in some demanding circuits.

We tend to design and manufacture simple products. We prefer to have products that have useful features with real benefits to the user. We choose not to have the most buttons or needless and useless features adorning every square inch of the front fascia. The result is that our products are easy to understand and operate, and they are durable. On a recent trip to the UK, I saw a 26 year old Rotel receiver in London at a restaurant where we were dining. This is a common application for our products, and actually constitutes a minor problem. Our products resist wearing out and replacement longer than mass-marketed products from many other manufacturers.

We believe in high performance, high value for money audio and video components. We have a long history of making excellent products and will continue to improve and grow in the future.