

Extended Resolution Compact Disc from JVC



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The **extended resolution compact disc (xrcd)** from **JVC** brings the listener high fidelity and improved audio quality by enhancing the process of mastering and manufacturing compact discs. All of this is done within the current CD standard, so no special CD or decoding box is needed to hear the benefit of the **xrcd**.

In most cases, after a record has been mastered, a U-matic 1630 tape is shipped to the replication plant. At this point the artist, producer and engineers can only hope that their work will return to them in a relatively unchanged form. The manufacturing chain not standardized, and while digitally correct, does not always produce the highest audio quality possible.

JVC has painstakingly gone through every step of the mastering and manufacturing process with the goal of retaining the highest sonic purity of the original music. Every combination of equipment, connections, AC power regulation, word clock distribution, mastering format, delivery system and compact disc construction was tested. The result is **tl xrcd** — a compact disc that offers clearer definition, more accurate imaging, and higher audio quality than any compact disc before. Best of all, **xrcd** does not require any decoding to be heard. The **xrcd** plays in any CD player.

The **xrcd** process starts at the mastering level. The analogue signal is taken directly from the mastering console and digitized using **JVC's** 20-bit K2 Super Coding. The K2 is a 20-bit, 128 times over-sampling analogue to digital converter which provides a dynamic range of 108 dB, -96 dB THD, flat frequency response in the passband to within ± 0.05 dB, and a substantial reduction of harmonic distortion for low level signals.

The K2 Super Coding also provides a bit down mode to convert 20 bits to 16 bits, and interface signal reshaping to eliminate time-based jitter in the digital data stream. These two functions are taken advantage of during manufacturing. The 20-bit digital signal is then transferred to a Sony PCM-9000 MO using SDIF-2. The **xrcd** process takes advantage of magneto optical disk stability as well as 20-bit capacity, by using the MO as the audio storage medium for delivery to manufacturing.

At the **JVC** manufacturing plant in Yokohama, the 20-bit MO is converted to 16 bits using the K2 Super Coding in bit down mode, via a SDIF-2 connection. This stage resolves the high resolution 20-bit signal to 16 bits while retaining the integrity of the low level information, which insures a true 16-bit dynamic range without using noise shaping. The 16-bit signal is then EFM encoded.

The K2 Laser interface is used to reshape the EFM signal just before going to the laser beam of the glass cutter. This last stage is the same circuit used for the K2 Super Coding interface, which eliminates any time-based jitter than may be present in the data stream. Throughout this process, the word clock is amplified and distributed to the other stages to keep signal quality at a maximum. Similarly, all equipment is run off regulated AC power feeds to provide a pure base. All cables and connections between equipment use the SDIF-2 interface for sonic quality and music integrity. Tests determined the SDIF-2 offered a superior transmission of digital audio, far above the AES/EBU standard.

A number of CD reflective coatings were tested, including 24k gold and pure copper. Ultimately, aluminum was picked after extensive listening tests, as providing the best audio representation. The end result of this manufacturing process is the highest quality digital transfer from mastering to compact disc. All of this attention to detail allows the listener to enjoy the music just as the artist, producer and engineers originally intended it. Every nuance of the performance is duplicated as it was recorded, with higher accuracy in both sound quality and imaging.

This is the **extended resolution compact disc**.