

Q. What is Skew?

Skew is the offset between the subchannel and the main channel data. It can only be measured in ROM data. EclipseSuite does this by issuing a "raw" audio read to the drive, which returns the exact subchannel requested and the adjacent main channel data. By examining the ROM header in the main channel data the offset from the subchannel to the main channel can be computed.

As a simple example, if a read is issued for 01:23:45, that subchannel data will be returned, but the main channel data may have an ATIME in the ROM header of 01:23:43, which would mean a skew of 2 exists. Skew is actually calculated with more precision than sector offsets - differences as small as 24 bytes - which means you can see skew changes in about 1/100 of a sector. So a typical skew number wouldn't be just "2", but rather something like 2.15.

Certain models of CD Readers make 24 byte errors in read back occasionally (this is the reason that audio reads are limited to 4X on most drives). So you may find the skew looks like 2.15 at the beginning, and then switches to 2.16 sometime later (which would cause an error to be reported).

To work around this problem, EclipseSuite tolerates a 1% variation in skew between the first measurement and the successive ones, and doesn't report anything if there is only a 24 byte difference.

By the way, typical skew numbers are in the 1.60 range. A negative skew would be a problem - some drives would not be able to read the disc. If the skew gets too large (maybe > 5?) it will slow performance, and possibly also not work in some drives.

The skew is created by the encoder (or CD-R writer) and should be a constant within the entire disc. The only reason that comes to mind as to why skew would change within a disc is if the first session was written on one brand of recorder, and the second session was written on a different brand.

Also, something to understand is that there is no "standard" for measuring skew. Depending on how the decoder inside a drive works, there will be different skew between different models of drives. What we actually see on a Plextor is typically about a .6 skew. In order to try to make this correlate to some existing piece of equipment, we added a "correction factor" that makes it report the same skew number as the original DCA SVS system. But customers have reported to us that even the newer DCA systems don't correlate to the older ones. The point of this is that you

shouldn't be surprised if two different testers report different skew for the exact same disc. However, each test should be consistent - and should also be a constant offset from each other.

Q. Does Eclipse measures the skew factor of every sector?

No, the skew is checked at the beginning of each ROM track. Checking each sector would be very slow.

Q. If I mold multiple discs with the same stamper, will the skew change?

No, the skew will remain constant. The skew is created by the encoder when the glass is cut. All stampers grown from that glass will have the same skew. And all replicates molded from any of those stampers will also have the same skew.

Q. How does the Eclipse Input System control the Skew?

For CD-ROM input, any skew on the input is removed when the image is read-in. When the glass is cut, the skew is set and controlled by the encoder. For the Eclipse Image Encoder, the skew will be about +1.6 sectors, which is a good number. If you have a negative skew on a replicate, then you may have playability or interchangeability problems in the field.

On audio discs there is not a good way to measure (or control skew). When the Eclipse Input System copies an audio disc, you'll find that the skew present on the original source is roughly maintained on the copies, with a possible small positive shift. Skew problems on audio discs are usually not noticeable since one sector of skew is 1/75th of a second - if would need to be much larger than that to be audibly detectable.