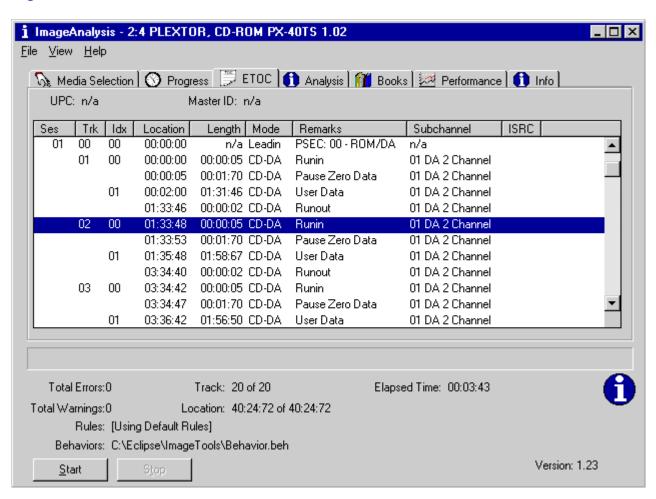## How are Track-at-Once Audio Discs Handled?

Audio players follow the Red book rules - which have no provision for link blocks. Yet, CD writers allow you to write audio discs track-at-once, which places link blocks between each track. Despite the ability to do this, track-at-once audio is a very bad idea.

That being said, in the real world people do this all the time. The audio player only has error correction, and concealment (muting & interpolation) strategies to deal with link blocks. The link blocks will likely contain 0 data, with some corruption, and this is pretty easy for a muting algorithm to handle.
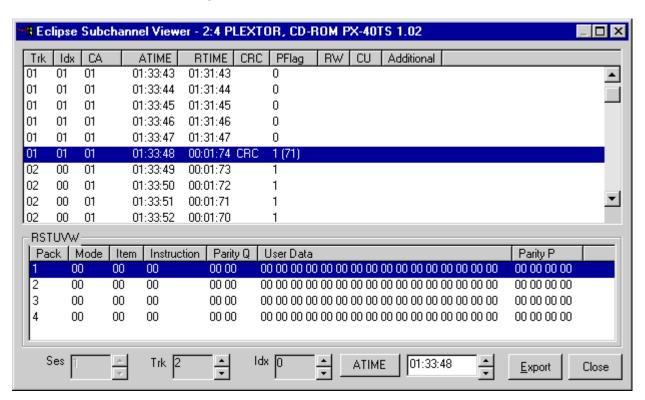

One thing to realize is that "Play" mode and "Digital Extraction" are two very different modes for CD readers. Concealment is only available in the Plextors while in Play- mode. EclipseSuite does not use Play-mode since error reporting (i.e. CU's) is not available in this mode (nor is the subchannel information). EclipseSuite uses digital extraction for all CD analysis and copying so that the full error reporting is available. If CU's are reported, then we can optionally deal with the main channel bytes suspected of being incorrect.

The Plextor drive does have some "magic" behavior at track boundaries on audio discs. The digital extraction usually shows that no CU's are present - although we clearly know otherwise. We have no document explaining what Plextor is doing, but it is a behavior we've observed since we started working with the Plextors several years ago.

How Are Link Blocks Detected on Audio Discs?

ROM sectors have a specific indication in the main channel that identifies the link blocks. The upper nibble of the mode byte has a value to indicate which of the link block sequence a particular sector represents. Run Out 2 and 1are E0 and C0, the link block itself is A0, and Runin's 1 through 4 are 80, 40, 20, and 10.

Audio has no such mechanism for marking link blocks. Originally, we had assumed that the presence of CU's at track boundaries would be a good test - but due to the "magic" behavior of the Plextor, this proved unreliable. What we finally determined was that the presence of Q channel CRC errors at track changes were a good indication of link blocks. Since CRC errors can occur normally (without a link block), we check to see if at least 50% of the track changes on an audio session contain the Q channel CRC errors. If so, then we identify the session as track-at-once, and with ImageCopy, we'll zero out 7 sectors at each of the track transitions during the copy.

By removing the link blocks, track-at-once audio discs will have at least seven sectors of silence between tracks - and therefore can not be used for audio masters that contain crossfades (or sound that continues from one track into the other). And it's not that ImageCopy isn't handling this correctly - but rather the authoring system isn't putting the correct data on the CD-R, it's putting link blocks in place of that data.