



# An Enhanced CD Survival Guide

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*Commissioned by the  
Apple Multimedia Program*



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## INTRODUCTION

### *A Positive Outlook*

While there has been a great deal of activity among developers in the production of enhanced CDs in the last eighteen months or so since the first enhanced CDs began to appear on the market, the same cannot be said for the efforts made by retailers to devote shelf-space to an entertainment format that has, in fact, a great deal of appeal to the consumer. This can be attributed to two main reasons; firstly, there has been considerable debate regarding the way in which enhanced CDs are created and the manner in which these formats are supported by equipment manufacturers; secondly, music retailers have been confused by the apparent difficulty in positioning a product that combines music and multimedia, a failure fueled by a lack of decisive strategy from record companies, and poor promotion from distributors.

However, with the emergence of a definitive E-CD format (Blue Book), and increased support in retail point-of-sale strategy by record companies and distributors, the enhanced CD can look forward to a more productive future during 1997.

### *Content is the Key*

Many early E-CDs suffered criticism for lack of content, functionality and support; this was generally down to the fact that the multimedia content was a bit of an after-thought, and often with little or no contribution from the artist. Furthermore, without peer pressure to produce deeper content, or a format standard to ensure compatibility on a wide range of platforms, E-CDs on offer were all a bit lame. The few big budget projects such as those from Peter Gabriel, Prince and Bob Dylan were CD-ROMs rather than enhanced CDs, and while they demonstrated a distinct interest in multimedia from the music business, failed to kick-start major interest in mass E-CD production. It was down to the small labels such as Ardent, numillennia and OM Records to create content that did real justice to the music, which after all is really what interests the consumer.

So if you're planning on developing a complex 300Mb strategy game, think CD-ROM; if you want to create a memorable enhanced CD, think of how creatively and interactively the multimedia experience can work with the music. The less said about a band on the CD sleeve, for example, the more can be said through multimedia. A good enhanced CD is more than just a few photos of the band and click, click, click. It's about using the available authoring tools to take full advantage of the medium - video, VR, interactivity with the web - and designing dynamic content that will give the user a great experience.

There has been much controversy over formats for enhanced CD; the three basic formats used by developers have been mixed mode, pre-gap and stamped multisession. These can be briefly described as:

### *Mixed Mode*

The computer data is placed in track one on the CD, while the stereo music channels (or Red Book audio) is placed in track two and onwards. For some years, this was the only method of combining music & multimedia, but the user had to manually skip track one in order to play the music. Messy, and record companies generally didn't like it -however, it was better than nothing.

### *Pre-gap*

The computer data is placed in the pre-gap of track one (as known as track zero). A effective concept, and one that still has many proponents. For the first time, the user could pop the CD in their stereo and hear music without having to worry about the potential of blown speakers. There were some compatibility issues with older CD-ROM drives and some in-car CD players. However, the format has suffered a fatal blow with the revelation that Microsoft no longer support pre-gap discs with their newer CD drivers, and will not in the future. So enter...

### *Stamped Multisession*

Stamped multisession is the technique of writing the audio data in a first pass, or session, closest to the center ring of the CD, and the computer data in the second session, thus creating a multisession CD. Audio CD players are not multisession-aware and thus play the music, ignoring the computer data. The majority of modern CD-ROM drives support multisession discs, and with the up-to-date drivers recognize the CD as an enhanced CD, mounting it as a CD-ROM while allowing access to the audio session from within an interactive application.

For a disc to meet the Blue Book specification, the stamped multisession disc must also contain certain information about the contents of the disc. This information is created automatically by Blue Book-aware applications such as Apple's Interactive Music Tool (AIMT) and Astarte's Toast CD-ROM Pro premastering software. Whether or not Blue Book information is included on a multisession CD, 'stamped multisession' is quickly gaining popularity among developers. Basically, it is to pre-gap what VHS was to Betamax; while both have the benefits and supporters, at the end of the day only one can survive if the consumer is to be better served.

## *Video & Audio Formats*

If you are planning a cross-platform E-CD, there is only one video format worth using - QuickTime. The architecture of Apple's revolutionary media format holds the key to many problems that developers once faced; universal support by authoring tool vendors, high-quality video compression, good synchronization, support for Windows, built-in, scaleable audio compression, MIDI tracks... the list goes on. Whatever your authoring tool, QuickTime video and audio is bound to be supported.

## *The Web Link*

With the web rapidly becoming the all-encompassing media delivery tool that it deserves to be, it is important that any E-CD take full advantage of an integrated Internet connection. Other than hooking the consumer into an updateable repository of information, it also serves to deliver advertising, merchandising, and other sales and promotional opportunities that record companies develop. When developing an E-CD, a web link can be integrated in a number of ways:

### a) Basic HTML

This involves shipping one or a number of local HTML documents loose on the CD, which when double-clicked, launches the user's own web browser and allows connection to a web site.

### b) Browser Link

This is a call from the interactive application to the user's web browser that first opens the browser, and then gives it a URL to go to. This is a clean way to integrate an Internet connection, and multiple URLs can be embedded throughout an interactive application. Apple's Interactive Music Tool also supports URL embedding.

### c) Integrated Internet

This uses a tool-set to let your interactive application work directly with information on the web, without the need for a browser. The XtraNet™ xtra for Director from g/matter & Human Code allows you to build http and ftp functionality into your Director-authored application. This is the most appealing way for a developer to ensure complete control over the look and feel and delivery of content to the consumer.

With either of the first two options, you have the option of shipping a browser on the CD itself. There is a very strong likelihood that if the user has a CD-ROM drive, they also have a modem, and ergo a web browser. License fees for Netscape and other browsers can be large - the third, truly integrated Internet option will certainly be very popular during the course of 1997.

## Authoring - Choosing your Tools

If you have developed interactive content before, the chances are that you already have an authoring tool of choice. Statistics show that you are probably using Macromedia Director, although Apple Media Tool and mFactory's mTropolis are very favored among many developers. This Survival Guide is not going to tell you what tool to use in developing your content - each authoring package has its advantages and disadvantages. However, if you do not choose one of the above mentioned products, you are probably going in the wrong direction if you're planning on a robust, cross-platform enhanced CD.

## Compression Rules

Contrary to the popular belief, size is extremely important - it is when planning a multimedia title anyway. The first step in your E-CD production is to ascertain how much space is available on the CD after the music has been taken into account. Red Book audio takes up 10Mb per minute of stereo music, so an average 45 minute album on a standard 74 minute CD leaves about 265Mb of space for your multimedia content (stamped multisession format eats about 25Mb of space for formatting). If you are planning on lots of QuickTime video, be aware that using average compression (320x240 window, 15fps, 180 Kb/sec 16-bit IMA audio), video takes up about 11mb per minute. You can get better video compression by shooting better quality video (e.g. Betacam SP or DV rather than Hi-8), and using specific tools for compression such as Terran Interactive's Movie Cleaner Pro software.

## Plan Ahead

The second step in your production should be to write a Product Design Specification (PDS). As well as being good practice to get your storyboard down on paper, the PDS is essential in defining how your product will function, and what the performance limitations are. After all, you'll look a little foolish if after two months hard labor, your interactive extravaganza only works properly on a 9500 or Pentium Pro with 64Mb of RAM and a 8x CD-ROM drive (believe me, it happens). The lowest common denominator changes each year as the market upgrades to faster, better machines, but the current (12/96) recommended minimum specs for playback of the average multimedia title are shown below:

### Macintosh

- 040 processor or faster (PowerPC recommended)
- Double speed (300 kb/sec) CD-ROM drive or faster (Quad speed recommended)
- 640x480 display capable of 256 colors or more (Thousands of colors recommended)
- 8Mb of available RAM or more (16Mb recommended)
- System 7.1 or later (7.5 or later recommended)
- Apple CD-ROM driver 5.1.2 or later
- QuickTime 2.5 or later
- 14.4k modem or faster (28.8k recommended)

### Windows

- 486 processor or faster (Pentium recommended)
- Double speed (300 kb/sec) CD-ROM drive or faster (Quad speed recommended)
- 640x480 SuperVGA display, 256 colors or more (Thousands of colors recommended)
- 8Mb of available RAM or more (16Mb recommended)
- Windows 3.1 or later (Windows T95 recommended)
- MSCDEX driver 2.23 or later
- Sound Blaster-compatible sound card and speakers
- QuickTime 2.1 for Windows or later
- 14.4k modem or faster (28.8k recommended)

Speed of use is important to the user; cache your graphics, optimize your palettes, watch your video data rate. Remember not everyone has a 16-bit display, so design your interface in 256 colors for better speed and lower RAM consumption.

### *Making It an Easy Experience*

End-users vary greatly in intellectual capacity. As a result, it is sometimes difficult to explain clearly how to prepare their machine for the E-CD experience. Building an installer that intelligently examines their computer, determining the correct extensions and drivers that need to go in various places, and then putting them there, will ultimately help both you and the consumer. Aladdin's StuffIt InstallerMaker (Macintosh-only) is an excellent idiot-proof installer creation tool for the non-programmer, while on the Windows side, SetUp Wizard or code tools such as Visual Basic can be used. If the Windows installer creation is too daunting, use an external consultant for this part.

### *Test, Test, and Test Again*

When you think you've finished your programming and it works fine on your Macintosh, you'll quickly realize that all sorts of things don't quite work the same way on a Windows machine. Traditionally, you discover this mere days before your deadline - don't get caught out. It is very unlikely that you will have in-house the 96 million possible configurations of PC CPU, video card, sound card and CD-ROM drive that Windows users have the delight of owning. Consider using a third-party testing facility for the Windows compatibility tests that your product really should undergo. The costs start at about \$35 per hour, which is totally worth it if you want to try and avoid too many bugs and hours of end-user technical support in the future.

### *Premastering - Getting your Act Together*

There is only one sure-fire way to create the premaster of your E-CD; Toast CD-ROM Pro from Astarte. This excellent tool directly supports the creation of Blue Book discs in conjunction with Apple's Interactive Music Tool. You first use AIMT to create the Blue Book information file (or QuAC file), and Toast uses this in conjunction with your hard disk full of media to create a cross-platform premaster that conforms to Blue Book specs. This process is covered well in the Toast manual, and if problems arise, Astarte have excellent US-based technical support.

### *Replication - Finding your Partner*

Not every CD-ROM replication plant is capable of stamped multisession CD production - this is due to their replication lines using older firmware. However, this will change as they upgrade their systems. Whoever you choose, make sure they have done Blue Book CDs before. Do NOT risk using a replicator who does not know what they are doing. The market is very competitive, and some less scrupulous companies, particularly brokers, might accept your job without having confirmed if they actually deliver. If in doubt, try Disc Manufacturing Inc. (DMI). They have produced numerous Blue Book projects with great success.

### *It's Done - You're On Your Own*

So you've survived the production of your enhanced CD. What next? Well, that bit is up to you and your distributor. If you have produced a title for a band who has a good relationship with their record company, and if the record company has a distributor that recognizes the value of interactive media, and if the distributor has worked closely with the retailer in planning an in-store point-of-sale strategy, the chances of your E-CD selling is good. In fact, if you've got this far, then you were born to succeed.

Products & companies mentioned in this Guide:

Apple Interactive Music Tool	<a href="http://www.amp.apple.com/imt">http://www.amp.apple.com/imt</a>
Astarte Toast CD-ROM Pro	<a href="http://www.astarte.de">http://www.astarte.de</a>
Grey Matter XtraNet™	<a href="http://www.gmatter.com">http://www.gmatter.com</a>
Human Code	<a href="http://www.humancode.com">http://www.humancode.com</a>
Macromedia Director	<a href="http://www.macromedia.com">http://www.macromedia.com</a>
mFactory mTropolis	<a href="http://www.mfactory.com">http://www.mfactory.com</a>
Terran Interactive	<a href="http://www.terran.com">http://www.terran.com</a>
Aladdin Systems	<a href="http://www.aladdinsys.com">http://www.aladdinsys.com</a>
Prestige Studios of the World	<a href="http://www.studiosource.com/prestige">http://www.studiosource.com/prestige</a>
Enhanced CD Database	<a href="http://www.musicfan.com">http://www.musicfan.com</a>

### *E-CD List*

This mail server was initiated by Apple Computer and Turntable Media, and has rapidly become a very popular forum for E-CD discussion. Populated by some of the leading E-CD developers, it is not for the faint-hearted amateur. If you have a question about E-CD production, this is where to ask it.

<http://www.turntable.com/ecd>

### *The E-CD Fact Book v. 2.0*

This excellent tome, commissioned by the Apple Multimedia Program and written by music business veteran Josh Warner, covers everything you need to know about E-CD production and marketing strategy. Now in its second edition, the book (available in electronic format) includes interviews with leading developers, case studies and market research information. Invaluable.

<http://www.amp.apple.com>

### *Interactive Music Handbook*

Written by Jodi Summers, published by the Carronade Group and co-sponsored by the Apple Media Program, the Interactive Music Handbook is the essential guide for interactive media developers, musicians, artists, audio technicians, students and suits interested in learning more about the art of interactive music. You'll learn how to create an Enhanced CD title and the intricacies behind the electronic distribution models that are shaking up the music establishment. The book includes case studies and interviews with over 30 top artists and executives in the music industry, including Liz Heller (Capital Records), Marc Geiger (American Recordings), Larry Rosen (N2K), John Bates (Billboard Live), Mark Waldrep (AIX), Charles Como (underground.net), David Traub (Media X), Thomas Dolby and Real McCoy. For more information contact the Carronade Group.

<http://www.carronade.com>

## ABOUT THE AUTHOR



Jim Baker is a former award-winning recording engineer, producer and Fairlight programmer, having worked with artists as diverse as Ultravox, Kim Wilde, Michael Bolton, Mantronix, and The Pointer Sisters. He is now President and CEO of 21st Century Media, an interactive marketing company based in Novato, CA., and studiosource, inc. publisher of the studiosource.com web site.

In 1994 Jim produced one of the first hybrid Enhanced CDs using a track zero audio technology, *The Studio Directory*, premiered at MIDEM in January 1995. He also produced the first commercial Blue Book enhanced CD *Prestige Studios of the World* released in February 1996, and sponsored by Solid State Logic, Mix Magazine, Compuserve and Apple Computer, among others.

Jim writes about multimedia in music for a number of publications including the newsletter of the National Academy of Recording Arts and Sciences (NARAS), and is the author of the QuickTime VR Survival Guide commissioned for the Apple Media Program, and producer of the Apple QuickTime VR Showcase CD-ROM.

Please send comments & suggestions for future editions of this Guide to:

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