



AIM Technical Notes

A Phage PerGram Corporation

TN #48: Preparing CD-I Titles for the International Marketplace

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Different levels of preparation may be adopted by CD-I developers to assure that CD-I titles can be used on the various television systems in the international marketplace. This note makes some recommendations to assist CD-I developers in preparing their titles for international distribution.

INTRODUCTION

CD-I will be introduced as a worldwide medium. There are provisions built into the standard to allow discs to be interchanged between the various television standards. However, different degrees of title preparation are possible.

This note concentrates on the technical and production aspects of compatibility and ignores content aspects. For instance, the "personalizing" of the Gardening Disc through a map of the U.S.A. is a typical example where the content of the disc, rather than technical compatibility issues, limits worldwide appeal. Such a disc would need to be reworked, no matter how much technical preparation is put into it.

The only concern addressed in this note is how to achieve compatibility from U.S. production toward playback on other TV systems, not the other way around.

VISUAL ASPECTS

We can have at least three levels of preparedness. I will rank them in order from simple to elaborate. (These levels are described more fully in the Appendix of V.2 of the Green Book, which provides complete guidelines for 525/625 image interchange.)

Level 1—Minimum

At the lowest level, each program must look at the settings in the configuration status descriptor (the entry for device type 3 in the CSD) of the player to determine how to set the

"compatibility bit" in the decoder. Failure to set this bit results in unrecognizable images when the player is connected to a "monitor-mode" display. This is true even for systems inside the U.S. market. This level of preparation is mandatory if the disc is to be "Green." For a typical title, this requires perhaps a man day of work—mainly to test for proper operation. Most titles have already been prepared for this.

Level 2—Horizontal Borders in PAL

Once the level 1 requirement has been satisfied, a PAL player displays the image in a recognizable fashion. Without further precautions, however, the active image will be on the top 240 lines of the 280-line display. The bottom forty lines will contain unpredictable visual garbage. Level 2 preparation involves insertion of 20 lines of a fixed, neutral color on the top twenty lines of the screen, and another 20 lines of the same color on the bottom. This eliminates the problem described above and gives acceptable playback on PAL systems.

This process requires an investment of approximately one to two man weeks for each title. None of the titles has used this strategy so far.

Although phrasing in the Green Book is open to different interpretations, I read it (Appendix, Volume 2) to say that this level needs to be achieved. Whether mandatory or not, we certainly owe it to the claim of "worldwide playability" that our discs play on a PAL player without forty lines of garbage on the display. Therefore, I strongly recommend that this be the level of choice for titles already in production.

Level 3—Full Compatibility

The highest level of compatibility is to use the recommended "compatible" image format. Retro-fitting this into existing titles is not economically feasible. However, for new designs, this is certainly an option.

This level gives full screen images in PAL without borders, even if the source image was captured in NTSC. Basically, this is achieved by reducing the captured image (768 x 480 pixels) down to the compatible format (384 x 280) rather than to the current format (384 x 240).

There are production tools that support this filtering. (For example, Optimager calls this function "scaling;" the Microware utilities call it R888resize; the Thomson utilities that are used on the SUN call it "reducergb" and in MacTrac is available in the CD-I IFF converter). This filtering capability is also included in the reference algorithm provided by Philips.

The cost of obtaining Level 3 compatibility does not lie so much in the extra effort of scaling. It resides more in predicting the outcome on two different display systems and

determining whether an optimum compromise has been achieved. PAL equipment needs to be available for a project to properly review compatibility, and more time needs to be spent on quality control of the images.

These activities could add some ten percent to video-related production costs, once set up and procedures are in place. Since video production costs are typically only a small part of total title cost, the overall impact on a budget would be on the order of a few percent.

AUDIO

With audio, there are three distinguishable levels of "preparedness." Note that there is no mandatory action required in this area for a title to be "Green."

Level 1—Fixed Timing

The simplest case here is translation of a single language to another language. A new disc image could be created with a new soundtrack replacing the old one. If the new narration is of equal length to the old one, nothing needs to be changed in the overall control software. Since synchronizing motion pictures and television material into new language has the same constraints as those for CD-I, this is a known problem with known solutions. The process could be fairly costly and the results not really optimal. However, if music is included as one of the pacing items, this could be the only alternative.

Level 2—Variable Timing

Again, this involves the translation of a single language to another language. If all of the presentations are done in a table driven manner, as we recommend to all titles, it is fairly easy to change the timing of visual effects and the appearance of new images. In this way, a new script could be created for the new target language and the display resynchronized to the new narration. Since the constraints on the narration are now significantly relaxed, a better result might be obtained at a modest production cost. The requirement for new titles going into development is that they follow our guidelines for table driven timings (which adds flexibility during production). Table driven timing is generally the best choice, even if there is no possibility of future dubbing.

Level 3—Multilingual Titles

If we want to prepare discs to become multilingual (that is, containing more than one sound track), we need to reserve space for the additional sound track throughout production and especially during the building of the disc image. If the original disc building script does not reserve sectors for an additional sound track, it will be difficult to insert it later.

The cost of doing this is not so much in equipment or man weeks, but in the performance of the title. Every additional C mono sound track reservation reduces the usable bandwidth by six percent, or increases load times by the same percentage. If a title can tolerate this loss, making the sound track reservation is a wise investment for those new titles that are candidates for multilingual treatment.

The underlying software structure needs to be table driven, as in Level 2, to gain maximum flexibility. Of course, if you are certain that a disc is going to be multilingual, the cheapest way overall is to produce it initially in its final form.

RECOMMENDATION

My personal recommendation is that we prepare all titles currently in production to Level 2, as described above for video, without taking any special measures for audio.

For future titles that are strong candidates for "internationalization," we should go all the way and prepare both audio and video to Level 3, as described above for video and audio.