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## AIM Technical Note #67

### Tape Submission of Disc Images

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*This document is intended to completely describe the format of a tape containing a CD-I disc image, whether that disc image is submitted for mastering by Philips DuPont Optical (PDO) or submitted to AIM to produce a limited number of one-off (WORM) discs. In addition, the process of making such a tape on the Macintosh using the standard AIM-supplied package and on the Sun using a public domain tape-writing utility is described.*

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## Tape Submission of Disc Images

### 1. Format of the Tape

CD-I disc image tapes must be ANSI format tapes. Disregarding the volume and header information written to the head of the tape, the tape should contain exactly one file—the CD-I disc image. This implies that the tape should be initialized prior to writing the actual data to it, especially in a case where data has been previously written to the tape.

Even though the ANSI format supports both variable-length record format and fixed-length record format, disc images may only be submitted using fixed-length records. The length of each record must be 2352 bytes—the size of a CD-I sector. The number of records per tape block ("blocking factor") may vary from 1 to 8. A blocking factor of 6 is recommended for all tape submissions, because this blocking factor makes most efficient use of the tape. This factor translates into a block size of 14112 bytes.

Unless you use a tape blocking factor of 1 (strongly discouraged), it is a distinct possibility that your disc image will not be an integral number of tape blocks in size. This means that the final block on the tape will be less than the size of a full block. The existence of short tape blocks causes problems for PDO, but they are able to contend with them, so for now it's best not to worry about it. Consult the section below on the individual tape writing software for your machine.

### 2. Making the tape

#### a. Macintosh

The AIM-supplied utility for writing ANSI tapes on the Macintosh is called QuTape (version 1.64). A tool called 2Tape was supplied earlier—if you have the latter, but not the former, please contact your production manager to obtain a copy of QuTape.

Once you have inserted the tape into the tape drive and the tape drive is ready, the you must first initialize the tape. AIM strongly recommends the use of brand new tapes for all disc image mastering submissions. If, however, you are reusing a tape, first select "Rewind tape" under the Control menu, then select "Erase Tape..." , also from the Control menu. "Erase Tape..." will present you with a dialog box; select the "Remaining Tape" radio button to erase the entire tape.

Once the tape is free of old data (by virtue of being new or having erased any old data), select the "Label Tape..." option from the Tape menu. You will again be presented with a dialog box. You may choose your own volume label (something

indicative of the tape's contents), and then select the "New Tape" button and confirm your choice.

Now that you have an initialized tape, you need to set the actual tape writing parameters. The simplest method for achieving this is to obtain a copy of the AIM-supplied tape building parameters; select the "Load Settings..." choice under the File menu; then use the file selection dialog to select the AIM-supplied file. If you do not have this file (you may obtain it from your production manager), you will have to create one by selecting "Set Tape Block Parameters..." from the Tape menu. You will be presented with a dialog box containing several settings. You should fill in the box so it agrees completely with the following snapshot:

Bytes per Tape Block: <input type="text" value="14112"/>	<input checked="" type="radio"/> Fixed <input type="radio"/> Variable	<input type="button" value="OK"/>
Records per Tape Block: <input type="text" value="6"/>	<input type="checkbox"/> Image mode transfer	<input type="button" value="Cancel"/>
Field Descriptors (separated by commas):	Descriptor Types:	
<input type="text" value="2352,"/>	nn: use next nn bytes	
	-nn: skip next nn bytes	
	O: Insert a <CR>	
	Descriptor Options:	
	U: convert to uppercase	
	L: convert to lowercase	
	C: make leading caps	
	A: append fields	
	B: packed decimal (Bur)	
	P: packed decimal (IBM)	
	T: trim trailing blanks	
	Q: "quote" the field	
	I: Integer (binary)	
	Z: zoned decimal	
	F: fill with leading zeros	
	R: right justify	
End of field char: <input checked="" type="radio"/> None <input type="radio"/> Tab <input type="radio"/> Comma		
<input type="checkbox"/> <CR> <input type="checkbox"/> <LF> at end of each record		
<input type="checkbox"/> Standard EBCDIC		
<input type="checkbox"/> Append to existing file		
Short Length Tape Blocks: <input type="radio"/> Error <input checked="" type="radio"/> Allow		

The following settings correspond to the requirements above:

- 2352 byte records
- Blocking factor of 6
- Block size of 14112 bytes
- Fixed record format
- No end of field character
- Allow short blocks

Once you have entered the above options, you should use the "Save Settings..." choice under the File menu to prevent having to re-enter them.

Once you have entered all the options, select the "Write Tape..." choice under the File menu. You will see the above dialog box again to confirm the settings. Check to make sure they agree with the above settings; if so, confirm the choice. You will then see the dialog box below:

Write:  10 Records  
 to End-of-File

Forks to use:  Resource  
 Data

OK  
Cancel

The number 10 (or any value that appears) is irrelevant, because you should select the "to End-of-File" radio button, and then confirm your choice.

Finally, you will be presented with a standard file selection dialog box. Simply select your CD-I disc image, and the program will begin writing the tape.

#### b. Sun

The software used to write ANSI tapes on the Sun is a public domain program called `ansitape`. It runs on both Sun3 and Sun4 architectures. There is a C shell script file installed at AIM called `make_pdo_tape` that completely automates the building of ANSI tapes on the Sun. If you are not in possession of either `ansitape` or `make_pdo_tape`, you may obtain copies of them from your production manager.

The following describes the function of `make_pdo_tape` so that you can mimic its behavior. The program `ansitape` requires explicit arguments to control each of the settings required for submission. The one piece of information you must have is the Unix name of the tape device you are using. For the purpose of illustration, let us say that the name of this device is `/dev/rsx0`, as it is here on our servers at AIM. After inserting the tape into the drive, simply type in the following command line:

```
ansitape ov mt=/dev/rsx0 bs=14112 rs=2352 oo=e  
filename
```

where `filename` is a path to your CD-I disc image.

To explain these parameters:

<b>ov:</b>	<b>Create and initialize the tape, be verbose about messages</b>
<b>mt=/dev/rsx0</b>	<b>Use the device named /dev/rsx0</b>
<b>bs=14112</b>	<b>Block size is 14112 bytes per block</b>
<b>rs=2352</b>	<b>Record size is 2352 bytes per record</b>
<b>cc=e</b>	<b>Embedded carriage control—do not assume any carriage control information about the files on the tape; that is, do not attempt to remove or restore terminating end of line characters, etc.</b>