

# How to Master a PlayStation™ CD



Creating a “Gold Disc” ready  
for product submission  
Paul Holman, SCEE

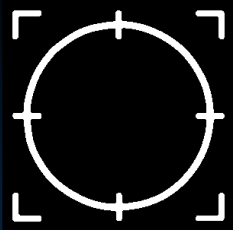


Sony Computer Entertainment Europe



# Objectives

- Overview of PlayStation™ CD's
- SYSTEM.CNF
- Introduction to CD-GEN
- How to Create a Master CD
- Tips and Hints
- Summary



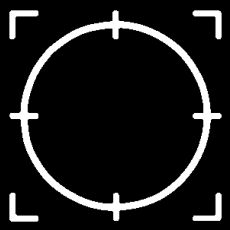
# Overview of PlayStation™ CD's

- Can hold upto 640Mb information
- Has an ISO-9660 file/directory hierarchy
- Can contain many forms of data
  - Executable files
  - CD-DA
  - Interleaved Video and/or Audio
  - Binary data



# Key Files on the Disc

- ❖ Track 1:
  - SYSTEM.CNF
  - Your Boot file executable
  - Associated Data Files
- ❖ Track 2 ... N
  - Optional CD-DA tracks



# SYSTEM DESIGNATION FILE

## Contents

BOOT = cdrom:\SLES\_123.45;1

device name:\Product number; version

TCB = 4

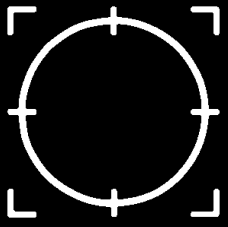
Number of task control blocks / possible threads

EVENT = 10

Number of possible events (in hex)

STACK = 801ffff0

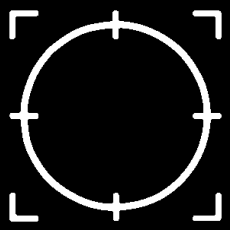
Stack pointer



# Boot Executable File

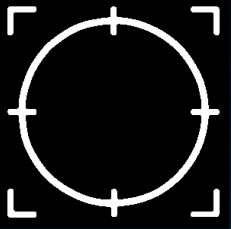
- Must be named “\XXXX\_AAA.AA”, reflecting your titles product code (and the BOOT parameter in SYSTEM.CNF)  
e.g. SLES-12345 maps to SLES\_123.45
- Created from a .CPE using CPE2X

*Remember your product code should also map to your memory card filenames and the Disc “Mastering Information”*



# The Hardware: CD ROM Burners

- Types of Burners
  - Sony CDW-900E
  - Sony CDU-921S \*New\*
- How do they work ?
  - burner laser melts dye layer of gold CD
  - recording pits (submicron deformations) are formed



# Hardware (continued)

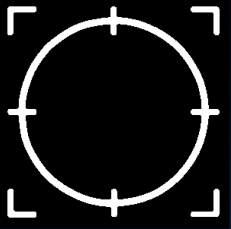
## ➤ Burner Pros

- Burns with constant linear velocity
- CDU & CDW very high quality - required to produce CD that can be used as Masters
- CDW-900E can be daisy chained

## ➤ Burner Cons

- Temperature and Vibration Sensitive
- Designed for mastering **not** copying.





# The Software: CD-GEN

- Version 1.10
  - Windows 3.11/WFW
  - Very demanding in terms of low memory
  - several notable problems
  - Based upon a Sony Music product - some features don't apply to PlayStation™



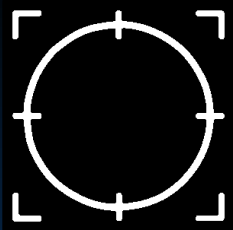
## ► The Software: CD-GEN

- Version (1.3) \*New\*
- Supports both Win3.11 and Windows95
- Supports CDW and CDU Burners
- Supports many forms of Adaptec SCSI Adapters
- Supports new CDU-921S
- Removes low (DOS) memory limitations



# How to Create a Master CD

- Development Using Emulator
- Preparing to create your CD
  - Output .CCS file from CDBUILD (-g option)
  - or
  - Handbuild .CCS file using CD-GEN (best)
- Use *defrag*'ed local SCSI discs for source where possible



# Using CDGEN - Volume Screen

- Not all fields are meaningful on a PlayStation™ Disc
- Set to 74min
- Remember to specify the license file !

CD-ROM Generator - t:\pholman\fut7.ccs

File Edit Help

Volume Directory Layout 74min 26:38:60 Rec...

Volume FUTURE\_DEMO\_7\_96 Volume Set

Publisher SCEE Data Preparer VINCE-PAUL

Application PLAYSTATION Copyright SCEE

Abstract

Bibliography

Creation 96-3-20 9:5:28.0 36 Modification 96-4-2 8:49:0.0 0

Expiration Effective

Comments Version 3 - Revamped AT

Additional Information...

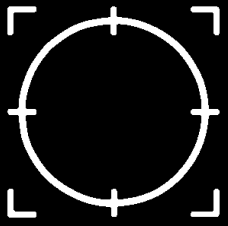
Additional Information

System Identifier: PLAYSTATION

System Area File: \data\licensee.dat

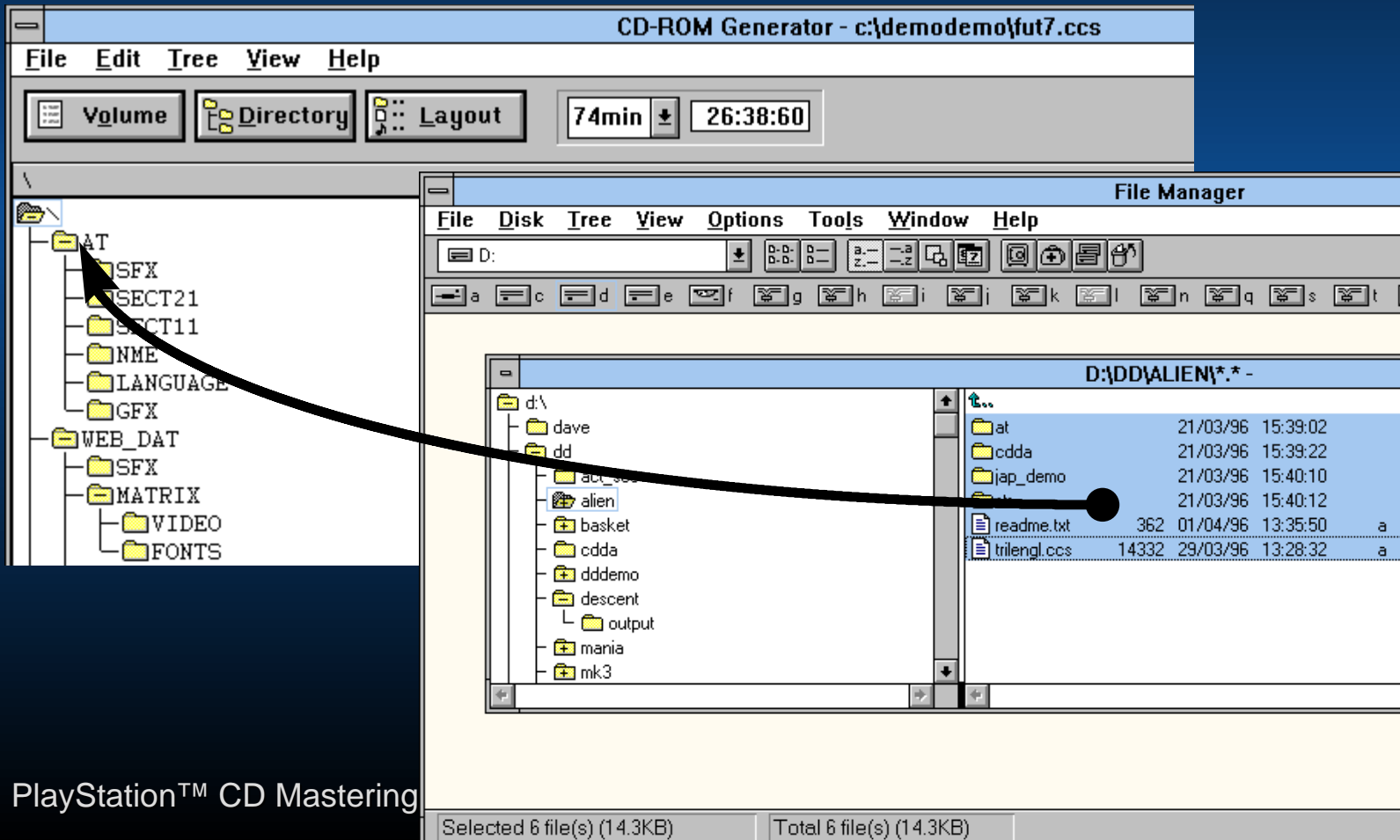
Volume Descriptor File:

OK Cancel

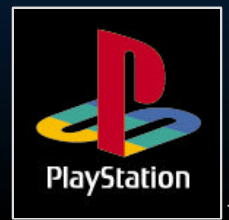


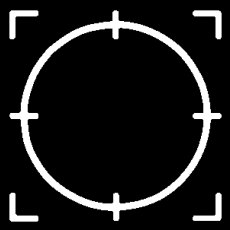
# The Directory Screen

*Drag & Drop using File Manager*



PlayStation™ CD Mastering





# Disc Information (Layout)

- Drag and drop CD-DA tracks to rearrange

CD-ROM Generator - t:\pholman\fut7.ccs

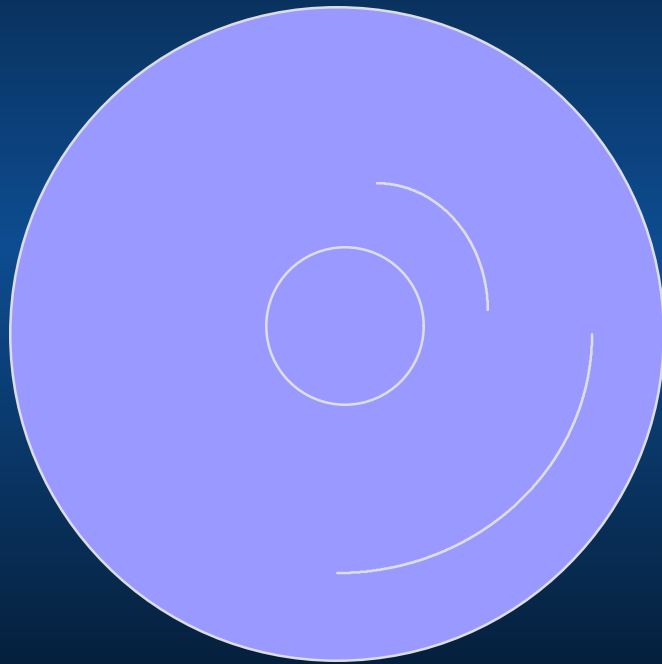
File Edit Help

Volume Directory Layout 74min 26:38:60 Rec...

Track	Index	Time	Form	Control	Track Name	ISRC
00	00	00:20:00	CDROM2_0	DATA		
01	00	00:00:00	CDROM2_0	DATA		
01	01	00:02:00	CDROM2_3	DATA		
02	00	25:25:04	CDDA_0	2CHAN		
02	01	25:27:04	CDDA_1	2CHAN		
03	00	27:37:34	CDDA_0	2CHAN		



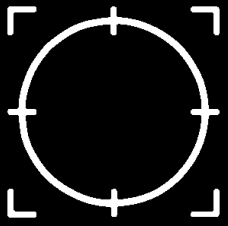
# Optimising your CD Layout



- Merge related data files into one file (best)

or

- Use “Layout” section to make files contiguous



# Disc Information (Layout)

- Drag and drop files, to re-arrange position of files on disc

	Start	End	Mode	Fno	Intlv	Path
	22	22	2.1	0	[ 0: 0]	--> \
	23	23	2.1	0	[ 0: 0]	--> \DD
	24	69	2.1	0	[ 0: 0]	--> \DD\PIRATE.EXE;1
	70	184	2.1	0	[ 0: 0]	--> \DD\DD.EXE;1
	185	196	2.1	0	[ 0: 0]	--> \DD\CREDITS.VLC;1
	197	432	2.1	0	[ 0: 0]	--> \DD\DD.VB;1
	433	463	2.1	0	[ 0: 0]	--> \DD\TICONS.TIM;1
	464	494	2.1	0	[ 0: 0]	--> \DD\DSICONS.TIM;1
	495	525	2.1	0	[ 0: 0]	--> \DD\GSTCONS.TIM;1

Track

Index

Location

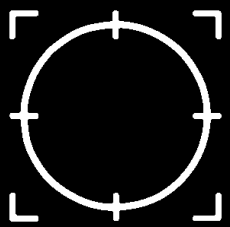
File No.

ISRC

Catalog

Master



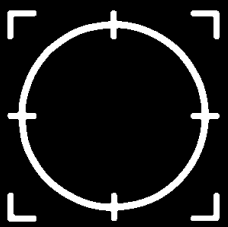


# Disc Information (Mastering)

Screen must match description on disc

**Master information** [X]

Disc Name:	<input type="text" value="SCES-00185"/>		
Producer Name:	<input type="text" value="SCEE"/>		
Copyright Holder	<input type="text" value="SCEE"/>		
Licence Area:	<input type="text" value="E"/>		
Creation Date:	Year <input type="text" value="1996"/>	Month <input type="text" value="4"/>	Date <input type="text" value="2"/>



# File Types

The 'File Type' dialog box has a title bar with a close button (X). It contains three radio buttons for file types: 'Standard File(s)', 'Subheader File(s)', and 'CDDA File(s)'. The 'Standard File(s)' option is selected. To the right of these options are 'Ok' and 'Cancel' buttons. Below the 'Subheader File(s)' option is a group box containing three checkboxes: 'Form 1 Sectors', 'Form 2 Sectors', and 'Interleaved Sectors'. The 'CDDA File(s)' option is selected.

- Standard file
- Subheader
  - XA Form 1
  - XA Form 2
- CD-DA



# Note on XA Frames

- XA Form 1
  - Includes CRC and error correction
- XA Form 2
  - No error correction.

XA-ADPCM is form 2, and should be interleaved with other Audio files, or video to make the best use of disc.

*See CD-II*



# CD-DA Tracks

- Promote to CD-DA type with “File Type”
  - In “*Layout*”
    - By default CD-DA track appear in Track 2
    - Use *Track/Append New Track* to create new track
    - Re-order with drag/drop into position
- or
- Drag directly from the file manager



# Caveats

Issues when moving from Emulator to Gold Disc:

- CdSearchFile limitations
  - limits on number of files per directory
  - CD-DA files are counted as files
- 2Mb Ram Limitation
- Rules on track lay out (3 minute rule for last track)



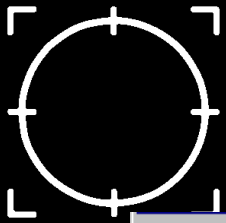
## Tips

- Use Windows *Properties* to specify default directory for *..CCS* files
- Use *Update/Date & Time* (with subdirs) to ensure that time stamps on disc matches those of source files
- Use **Mcheck** to verify Mastering Infor
- Use **BUILDCD** with -1 (ISO) during design

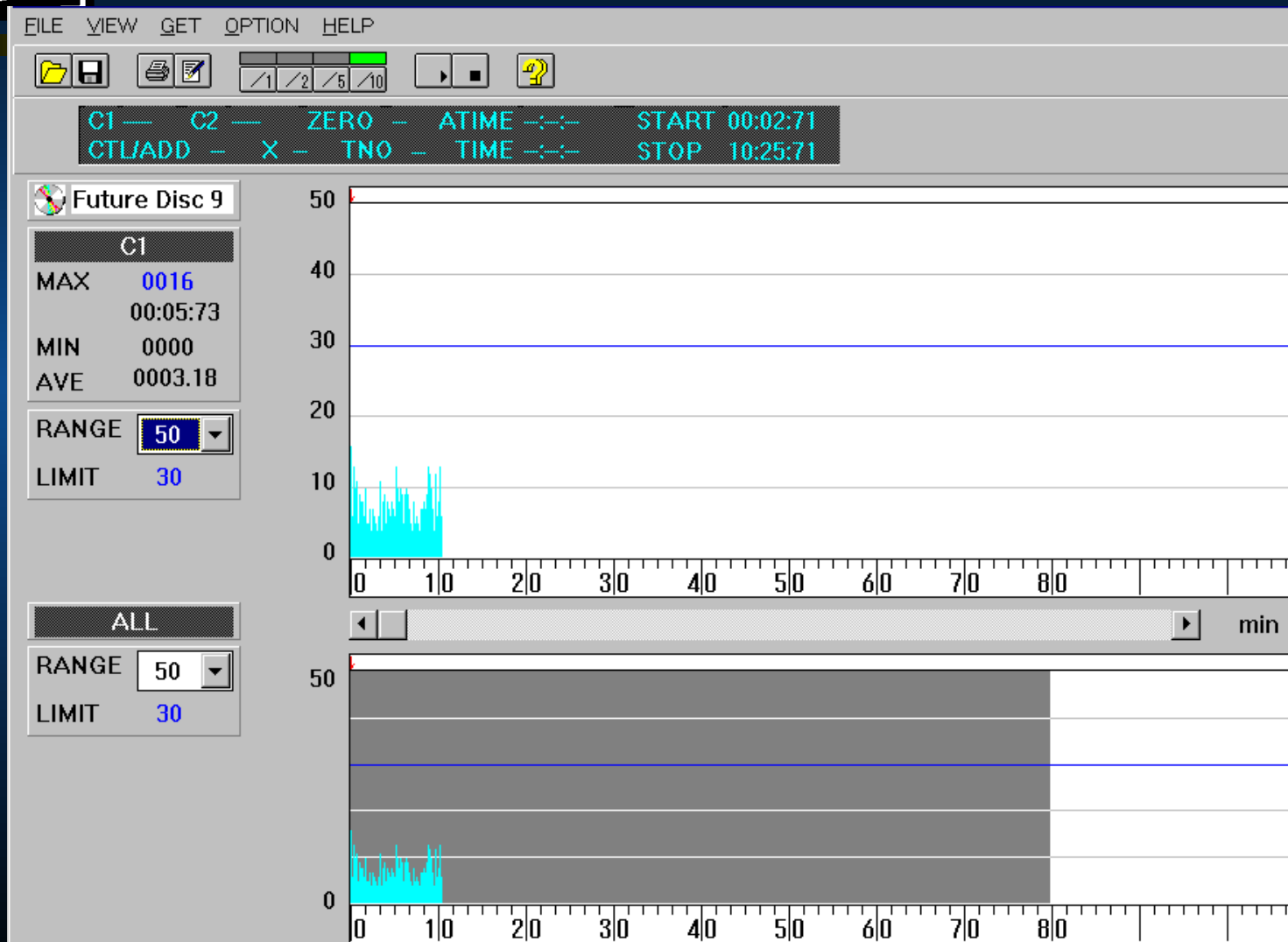


# Associated Tools

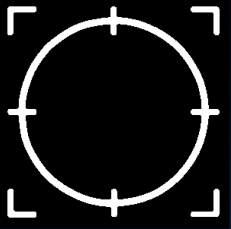
- **mcheck**
- **ccs2cti**
  - V1.02a needs comments fields
  - V1.02a has problems with complicated ..CCS files
- **buildcd** “-g” option (to output a ..CCS file)



# Tools - Error Checkers







# Problems (Hardware related)

- Use Probe SCSI (and Adaptec utility) to verify unit can be “seen”
- Try powering everything off and on
- Keep it (and You!) cool



# Problems (Software related)

- Doesn't start up ?  
Often memory related (<640K DOS barrier) - tidy up CONFIG.SYS, or use QEMM etc...
- Won't restart ?  
Try cleaning up temporary files, and reviewing the log file.



# Summary

- Creating a PlayStation™ CD
- The Tools
- Next Step ... submitting for approval