



**CD/DVD Burning on eComStation**

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**Julian Thomas**

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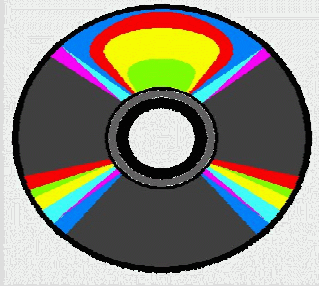
Warpstock 2006 leadin slide

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# CD and DVD burning

Julian Thomas



- CD & DVD Media
- File Systems
  - ISO 9660
  - UDF
- CD-R & CD-RW
  - cdrecord
  - cdcreator
- MKISOFS
- DVD +/-R; +/-RW
  - Dvddao
- Files you will need
- Installation
- Demo

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Rehash of my WS2005 presentation - not much new.

Reference Alex Taylor presentation on: Creating video DVD's later today..

Slide shows what I am going to cover. Some notes:

- Most modern ATAPI CD and DVD burners will work with “generic” drivers.
- From a posting to the eCS yahoogroup:  
Unfortunately PC to Home DVD player compatability remains problematic. I don't know if the new Dual-layer 8.5GB DVD discs and burners are any better but certainly some home DVD players are better at playing PC created 4.7GB DVD video discs than others. Generally, but not always DVD-R are supposed to be better than DVD+R for compatibility. Burning DVD's takes a fast CPU ( $\geq 1$  GHZ) and probably ATA100 or better.

What I'm **NOT** addressing:

- video or direct recording of audio
- SCSI (should work) or USB (not known to work) attached burners
- : RSJ (although it has a good reputation and is a viable alternative).

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## About Media

- : CD (650-700 MB)
  - CDR – write once.
  - CDRW – rewriteable.
- DVD (4.7 GB)
  - +R, +RW
  - -R, -RW
    - +R may be faster
    - Only -RW can be blanked by DVDDAO
    - Some older players/burners limited to +R +RW
    - Other players/burners limited to -R -RW

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These are 'consumer grade' media -there are also special media for mastering; also DVDROM.

SOME CD players and older CDROM drives won't play/read CDRW media.

As you can see, the DVD situation is muddled by two media types, originated by different groups of manufacturers.

**DVD+R +RW:** Philips, Sony, Hewlett-Packard, Dell, Ricoh, Yamaha and others.

**DVD-R -RW:** Panasonic, Toshiba, Apple Computer, Hitachi, NEC, Pioneer, Samsung and Sharp.

Many currently available drives will work with either type, although DVD compatibility is not guaranteed unless both the writer and the player use the same (+ or -). Some players/drives won't read RW.

I'm not addressing double layer DVD.

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# ISO 9660 File System

- : ISO 9660
  - Level 1,2,3
- ISO 9660 Extensions
  - Rock Ridge (UNIX features)
    - ↳ Includes long filenames, upper and lower case, ...
  - Joliet (Microsoft; not an official standard)
    - ↳ Special header; Unicode file names
    - ↳ Ignored on non-Joliet systems
  - El Torito
    - ↳ Bios extensions to allow CD boot
    - ↳ Boot format on CD
  - HFS (Apple)
  - Hybrid extensions – not strict ISO 9660
- 4 : Write Once or Multisession

ISO9660:

- ▣ Level 1 8.3 Upper case filenames
- ▣ Level 2 Long file names (still UC)
- ▣ Level 3 fragmented files (still UC)

mkisofs creates the image for this file system (either explicitly or via piping (“on the fly” with CDA Creator).

**Lots of options to mkisofs.** - read the documentation.

-U

Allows long filenames, lowercase, leading dot filenames (common in Unix, like .exrc), more than one dot. Omits version numbers (only useful in Unix environments).

It's possible to write a CD/DVD that is readable by a Joliet system, a Mac, and an OS2/eCS or Unix system.

I'm not addressing multisession or the details of making bootable media. Hayo Baan's bootable is a good place to start.

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# UDF File System

Media **MUST BE** RW

Block rewriteable – like a hard drive

FORMAT s: /FS: UDF [/L /W]

UDF from eCS 1.2 installation CD didn't work  
– need update: udf215.zip

: Windows XP (nothing earlier) can read  
(write?)

Buggy, SLOW.

Gets confused if more than one RW device  
in system.

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Either CD/RW or DVDRW.

format x: /FS:UDF [/F] [other options]

(/F – long) or:

pmformat x:

udf015. Zip includes:

lock.exe, unlock.exe, pmformat.exe

readme file with UDF format options.

(Beware the unrelated unlock.exe in /ecs/bin)

What usually works once the media has been formatted::

- Read and Write to the UDF fs – just specify its drive letter as part of the filespec.

- Unlock

Eject.

**WARNING:** Writing does an implicit lock. eject.exe DOES NOT do an unlock.

Sometimes need chkdsk s: /F when the media isn't readable on loading.

Windows XP doesn't even call it UDF.

Interoperability with other operating systems is not a sure thing.

Mixed reviews of W2k UDF 3<sup>rd</sup> party drivers.

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## Installation Overview

- : System preparation
- “Shopping list”
  - Basic preparations (drivers, EMX, etc.)
  - dvddao and mkisofs2
  - CDRecord
  - CDACreator
    - set options
- : DVDDAO
- : Try it!

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System prep:

- ▣ space for programs
- ▣ work area(s) for iso image files  
(~700 meg for CD; 4+ gig for DVD) -  
**EACH.**
- ▣ DVD work area should be on JFS volume.

Next slides go through this process in more detail.

Buy some RW media for your first tries!

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## Shopping list

- : RW Drive (if you don't have one)
  - Install – preferably as master on 2<sup>nd</sup> IDE adapter
- Media (get some RW for testing!)
  - DVD – verify that the media works in your drive
- : Free Downloads

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As observed earlier, most modern ATAPI drives will work using generic drivers.

For DVD, try to get a drive that works with both +R/RW and -R/RW

## Download list

emx0944.zip	Hobbes	in eCS
danis506r177.zip	Hobbes	
daniatapi0319.zip	Hobbes	
aspirb9.zip (aspirout)	Hobbes	pub/os2/system/drivers/scsi
wpswizard-0_5_1-eng.zip	<a href="http://www.os2world.com/cdwriting">www.os2world.com/cdwriting</a>	
cdrecord-2_00_os2.zip	<a href="http://www.os2world.com/cdwriting">www.os2world.com/cdwriting</a>	
MMAudioPak.zip	<a href="http://r6.ca/MMAudioPak">http://r6.ca/MMAudioPak</a>	(optional)
cdrtools2-2.01.zip (mkisofs2)	Hobbes	
dvddao-1.3.4	Hobbes	

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- emx – installed as part of eCS
- Danis506 – may want to look for 171 level; I had problems on one system with 173. Haven't tried 177.
- Latest levels are critical for:
  - aspirout
  - cdrecord [cdrtools] (**use the one on the os2world site!**)
  - AudioCDCreator (unfortunately the os2world site does not have 056; get it from Hobbes)



## Installation – first steps

### BACK UP YOUR .ini files

- **Better yet – back up your entire boot partition**
- : Install DANIS506.ADD, DANIATAPI.FLT
  - CONFIG.SYS changes and deletes
- Switch to classic REXX (SWITCHRX.COM, reboot) if needed.

Create directories for

- WPSWizard
- Generic installer
- CDRecord unzip
- CDRECORD final
- ACDCreator unzip
- ACDCreator-2.00 final

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This process is quirky and not always easily reversible if something goes wrong.

I will just note that on each of two installs, I had to restore the boot partition to recover from problems (of my own making). The “wisdom”[?] here is an attempt to help avoid those problems.

My directories:

- g:\wpswiz
- g:\cwinst
- g:\cdrecord-unzip
- g:\CDRecord200
- g:\acd056unzip
- g:\ADC056

Problems I had:

- OREXX caused an installation script to fail.
- eCS 1.1 with not a lot of fixpacks – danis506r173 caused OS2DASD.DMD to beep and then OS2CDROM would not load. Reverting to earlier DANIS506r161 cured this.

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## Installation – next steps

Install WPSWizard

- Unzip it to where you want to install it, run install.cmd

Unzip CDRECORD to the work directory

- Install it (install.exe)
  - This will ask if you want to install the generic installer. Do it (remember where it went).
  - Do not allow it to install ASPIROUT
- Rerun install.exe and install just ASPIROUT
- Unzip aspirb9.zip to a temp and replace the aspirout.sys installed by CDRECORD.
  - Should be in OS2\BOOT also
  - Check config.sys entry

Run the generic installer and uninstall it.

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If you install CDRECORD and aspirout at the same time, you may have trouble overriding directory defaults. I found doing them separately was cleaner.

The CDRecord installer may put aspirout.sys in a strange place (and use that address somewhere else in the process. I prefer to put the aspirb9 version in os2\boot and use that address in config.sys.

For better documentation on aspirout.sys, get the older package aspir101.zip from Hobbes.

We will install a later version of the installer with ACDCreator.

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## config.sys

- : Should include the following:
  - EMX entries in SET PATH and LIBPATH
  - BASEDEV=DANIS506.ADD
  - BASEDEV=DANIATAPI.FLT
  - BASEDEV=OS2ASPI.DMD /ALL
  - DEVICE=ASPIROUT.SYS
- : Remove (or REM)
  - REM BASEDEV=IBM1S506.ADD
  - REM BASEDEV=IBMATAPI.FLT
  - REM BASEDEV=IBMIDECD.FLT

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This is extracted from ACD work directory  
\help\tutorial.inf (addressed on next slide).

Drive and paths as appropriate for your  
system and personal preferences.

I like device drivers in x:\OS2\BOOT

## Installation – ACD Creator

### Reboot

- Unzip audiocdcreator\_056 to a work directory.
- Read \help\tutorial.inf and carefully review/follow the steps.
  - emx is probably already installed. Verify level and update only if needed.
  - Open the CDRECORD folder and click on “Scan the SCSI/ATAPI bus”. If you don't see your CD/DVD devices, something is wrong.
- NOTE that CDRecord and ACDCreator have their own installer **install.exe**
- Run the installer for ACDCreator, on completion it will bring up the setup screen.

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The previous 2 slides covered the first steps in the instructions (tutorial.inf).

ACD installation will allow you to specify the destination directory.

A subsequent slide will show the results of a bus scan.

ACDCreator has a later version of the install.exe program, which is why we removed the one installed by cdrecord.

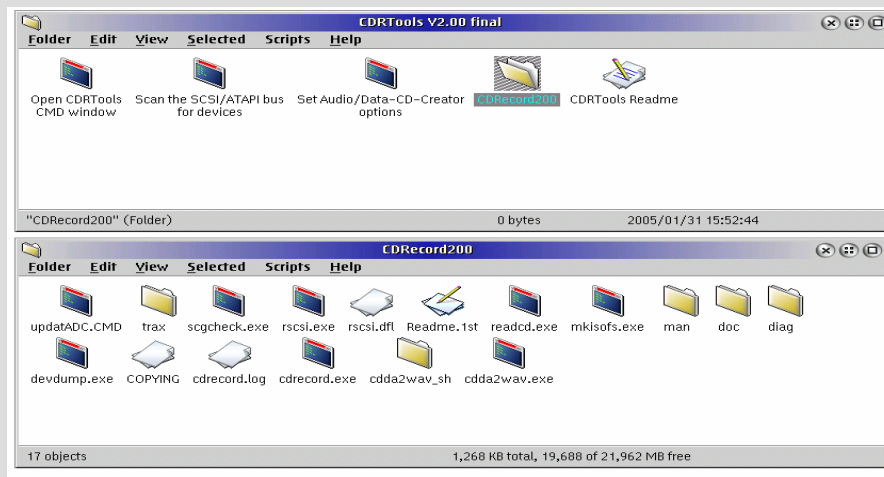
**BE SURE to install the installer to the same directory where the older one had been!**

Another problem I had:

▮ Botched installs of Creator resulted in no WPS objects. Fix was to go into ADC\_056/inst, make a modified copy of creatobj.cmd changing “update” to “replace” in SysCreateObject() calls, and run it.

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# What you get - 1



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CDRecord folder (top) and full view of inner folder

Note:

- Scan
- Readme
- Documentation is in the doc folder in the inner folder

You can do everything from the command line with `cdrecord` and other programs in the package:

`mkisofs`

`cdrecord` with no options: interactive mode.

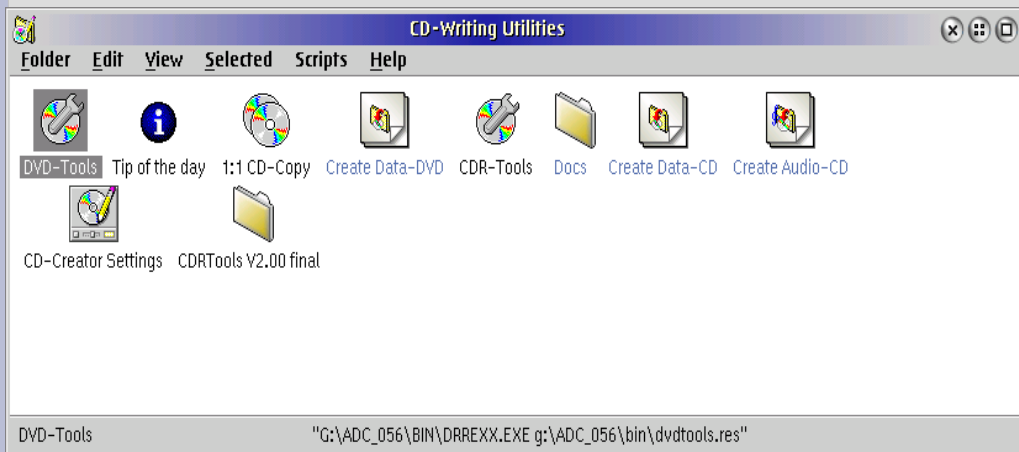
`cdrecord speed=## dev=0,1,0 <-raw> <-eject> <-immed>  
<iso filespec>`

Copy audio CD:

1. `cdda2wav dev=0,1,0 -vall cddb=0 -B -O wav`
2. `cdrecord dev=0,1,0 -useinfo -text *.wav`

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## What you get - 2



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CD Creator folder

CDR tools: Blanking, FIX (multisession),  
load, unload CD

DVD tools: Blanking, format

1:1 copy does either data or audio

Create icons are special folder types.

More when we get to the demo

# Bus Scan

```
Scan the SCSI/ATAPI bus for devices
Cdrecord 2.0 (i386-pc-os2_emx) Copyright (C) 1995-2002 J+rg Schilling
Using libscg version 'schilly-0.7'
scsibus0:
 0,0,0 0) *
 0,1,0 1) 'HL-DT-ST' 'DVD-RAM GSA-4160B' 'R301' Removable CD-ROM
 0,2,0 2) *
 0,3,0 3) *
 0,4,0 4) *
 0,5,0 5) *
 0,6,0 6) *
 0,7,0 7) *
scsibus1:
 1,0,0 100) *
 1,1,0 101) *
 1,2,0 102) *
 1,3,0 103) *
 1,4,0 104) *
 1,5,0 105) *
 1,6,0 106) *
 1,7,0 107) *
scsibus2:
 2,0,0 200) *
 2,1,0 201) *
 2,2,0 202) *
 2,3,0 203) *
 2,4,0 204) *
 2,5,0 205) *
 2,6,0 206) *
 2,7,0 207) *
scsibus3:
 3,0,0 300) *
 3,1,0 301) *
 3,2,0 302) *
 3,3,0 303) *
 3,4,0 304) *
 3,5,0 305) *
 3,6,0 306) *
 3,7,0 307) *
scsibus4:
--More--
```

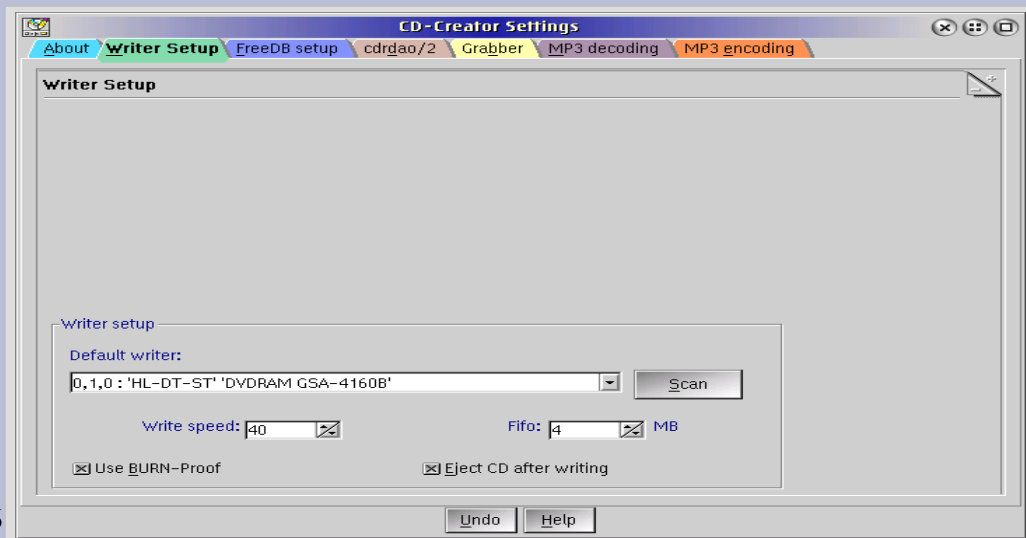
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If this doesn't show your burner, something is wrong with the installation.

You will need the burner ID for command line `dvddao` or `cdrecord`.

If you also have a CDROM (or DVDROM) drive that you want to use as a source for copies, note its ID also.

## CD-Creator settings



Scan should find your burner.

Other tabs:

FreeDB – gets song information

cdrdao/2 – audio writer setup;

1:1 copy source and target spec

grabber – specify source device

(create audio CD template has grab option)

.



## Installation – DVD tools

- : `dvddao.exe` [1.3.4 level]
  - Somewhere on the path
  - Needs:
    - `BASEDEV=DANIS506.ADD`
    - `BASEDEV=DANIATAPI.ADD`
    - `BASEDEV=OS2ASPI.DMD /ALL`
    - `DEVICE=D:\OS2\BOOT\ASPINKK.SYS`
- `mkisofs2.exe`
  - extract it and the documentation from `cdrtools2-2.01.zip`
  - put it somewhere on the path
- : You will need a JFS volume work area for large iso files

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`dvddao` has abandoned use of `aspirout.sys` in favor of `aspinkk.sys` (included in the zip). It does no harm to also have `aspirout.sys` in `config.sys`.

`mkisofs.exe` from the CDRecord package cannot create an iso file larger than 2 gig, hence the need for `mkisofs2`.

## Data CD recording

- : Create a data CD
- Drag file objects into the folder
  - These are shadows – deleting won't delete originals!
- Either:
  - “Create image”
  - “Write image”
- Or:
  - “On the fly”
- : Uncheck “Test Only”
- : If you have an ISO file, select it and “Write Image”.

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We are about to demo this!

DFSEE, for instance, is distributed as an ISO file. You can select it using the “browse” function and then just write the image.

## Music CD recording

- : Create Audio CD
- Drag or grab .wav files into folder
  - If you just want to copy a CD, use 1:1 CD copy
  - You may need a **grabber** (“ripper”) to extract selected .wav files from audio CDs, or use Grab mode.
  - Grab mode uses cdda2wav.exe

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Can either use grab function in audio CD template, or wav files that have previously made it onto your hard drive.

Grabbers:

leech (and its GUI front end)

cdad

cdda2wav (part of Creator package)

Hobbes /pub/os2/apps/mmedia/cd/grabber

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## DVD Recording – command line

- `mkisofs2 -U -o <outfile> <datafile[s] or directories>`
  - `-U`
  - Allows long filenames, lowercase, leading dot filenames (common in Unix, like `.exrc`), more than one dot. Omits version numbers (only useful in Unix environments).
- `dvddao -s ## -d 0,1,0 --lock X <source iso file>`
  - `-s`: writing speed
  - `-d`: device bus address (from scan)
  - `X`: drive letter of the DVDRW drive
- `dvddao --blank [fast/full]      only on DVD-RW`
- `dvddao --format [dvd+rw, full, dvdrwfull (DVD-RW), others]`
  - `dvddao --format help`

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Note blanking restriction to -RW and need to specify +RW format

The `--lock` option may not be necessary but it may also avoid making a coaster if the WPS or some other application tries to open the drive while a burn is in process.

See the `dvddao` readme file for how to set options in a config file.

## DVD Recording - CDACreator

- : Create Data-DVD
- drag/drop
- Write

***Didn't work when I tried it. DVD was  
"unknown media type".***

- 0.56 history says:
- "Preliminary DVD writing"

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That's all – almost ready for the demos!

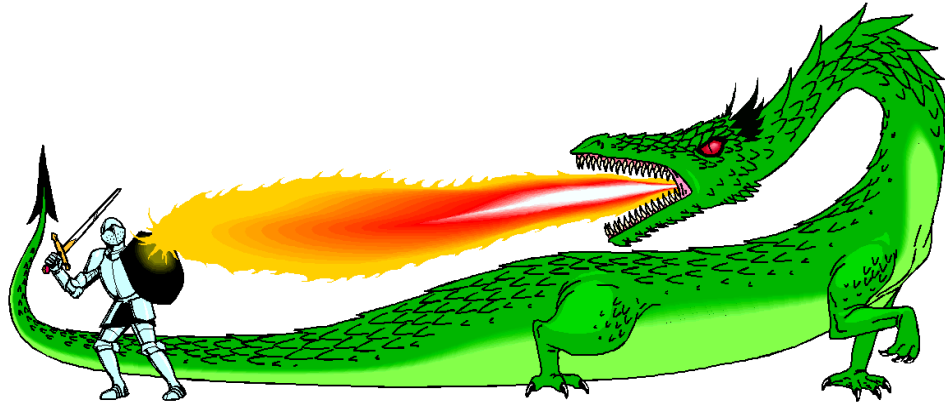
## Where to get the programs

: ftp.jt-mj.net (anonymous, your email address as password)

The public directory will contain:

- burning06.zip (these slides as a PDF file and all the programs on the “shopping list”)

## Let's do some Burning!



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1. Burn a data cd (using the burning subdir – all files).

Make image, then burn image.

Give result away.

2. Bring up create audio CD. Switch to grab mode. Grab 2 files (Solid Brass at the Opera) – tracks 4 and 9

Don't burn.

Play these.

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