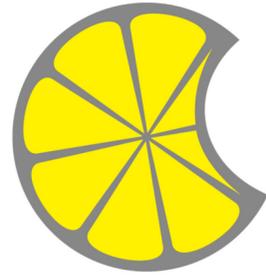


Camp++ 0x7e2  
Backups (occasionally...)



**MacLemon**

**Mastodon:** @MacLemon@chaos.social  
**Twitter:** @MacLemon  
**Web:** <https://maclemon.at/>

# Backups

occasionally...



# Backups

occasionally...

**What do we want?**

**A good feeling!**

**When do we want it?**

**Now!**

# Disambiguation

Citation needed!

to back up

someone

Your back up

a feeling

# Back up!

Move, move, move

**to be back up**

on your feet

to back up

beedoobeedoobeedo

**Backup, backup, backup!**

Recommendation

How much could you loose?



**Applicable laws**

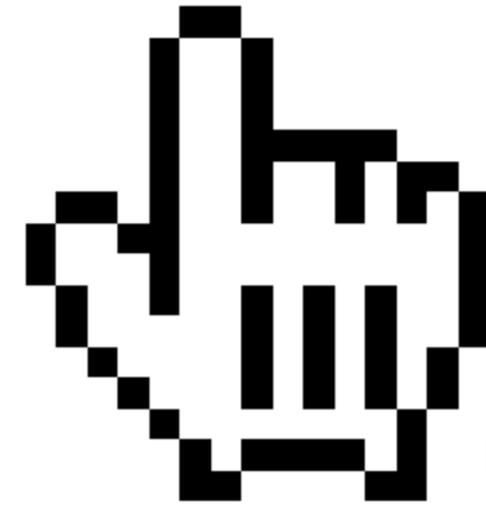


Murphy's Law

# Murphy's Law

Anything that can go wrong  
will go wrong.

— Edward A. Murphy jr.



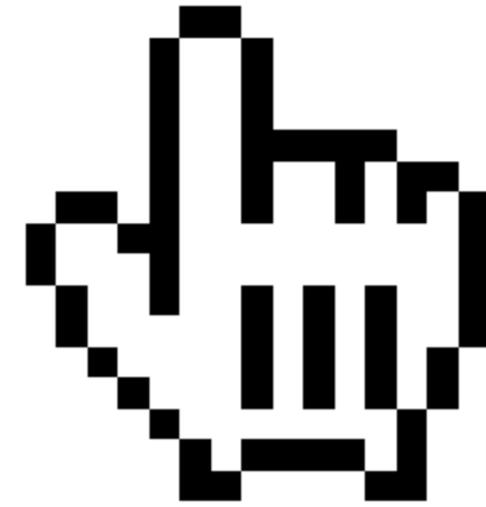
# Finagle's Law

of dynamic Negatives

# Finagle's Law of dynamic Negatives

Anything that can go wrong, will  
- at the worst possible moment.

— John Wood Campbell Jr.



# Hofstadter's Law

# Hofstadter's Law

It always takes longer than you expect,  
even when you take into account  
Hofstadter's Law.

— Douglas R. Hofstadter



1

TIDIT FALL WIFE

LOW  
NOISE  
HI-FI

Compact  
Cassette



Audio-Cassette C-60



2

HANG MAN

LOW  
NOISE  
HI-FI

Compact  
Cassette



Audio-Cassette

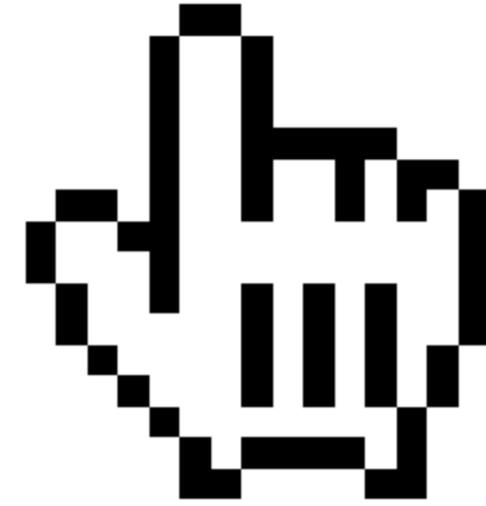
C-60

# The Problem

**Data loss**



**Lost data?**



**Lost data?**

**ATARI DISK  
OPERATING SYSTEM  
DISKETTE  
REVISION 2.0s**

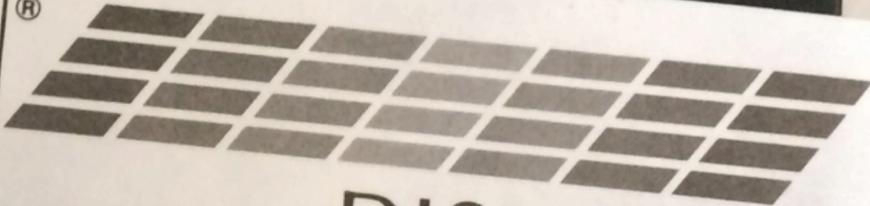
This diskette is needed for your  
ATARI® 1050™ Disk Drive. Do not fold  
or bend. The enclosed booklet, "An  
Introduction to the Disk Operating  
System," describes its use.

**ATARI®** 

ATARI 810™/1050™  
MASTER DISKETTE II

CX 8104



**ATARI®**   
DISKETTE



**What is data?**

**Classification of data?**

FLASH-BA4-BAC46P-LOW-PARTITION

8Q372

2-2018

15 July

18 min 58 s

7/6

ESCOM

FLASH-BA4 BAC46P LON PARTITION

SQ372

7/2018

15.30.50

18 min 580

7/6

ESCOM



**Criteria?**

# Amount?

$2^?$

# Change?

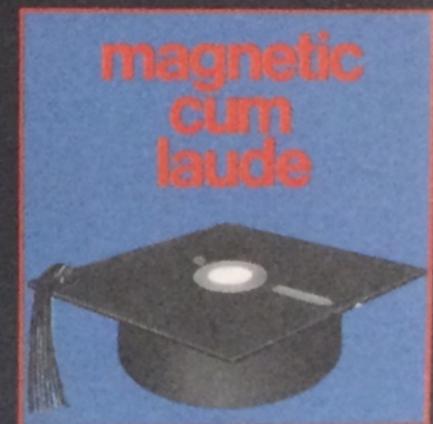
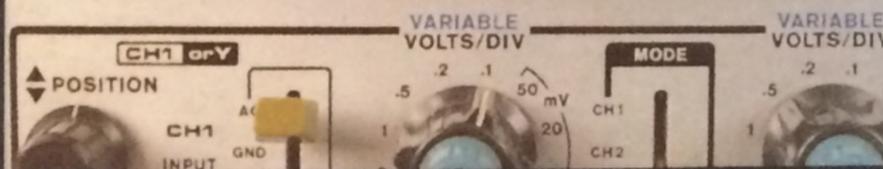
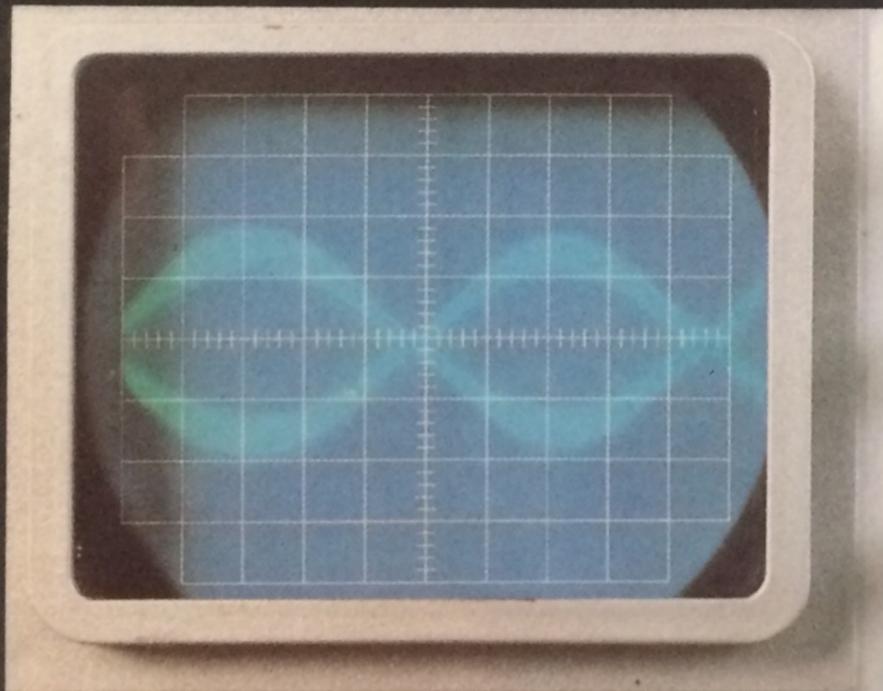
Bytes  
Time

**Criticality?**

ZAXXON —  
THE LAST STARFIGHTER  
BUCK ROGERS  
STRATOS



# Disky®



ZAXXON —  
THE LAST STARFIGHTER  
BUCK ROGERS  
STRATOS

**Relevance?**

**Irrelevance?**

**SEP field?**

**IBM** **DOS** 94X9607  
Programmdiskette  
Version 3.0  
Nutzung, beschränkt  
Nutzung  
© Copyright International Business Machines Corp. 1981, 1987  
und Verbreitung, nur  
Programme, die zu diesem Programm gehörend  
sind. Made in Denmark

**IBM** **DOS** 94X9604  
Startdiskette  
Version 3.30 © Copyright International Business Machines Corp. 1981, 1987  
Nutzung, insbesondere Vervielfältigung und Verbreitung, nur  
beschränkt erlaubt. Vergleiche die zu diesem Programm gehörenden  
Nutzungsbedingungen, die auf Anforderung erhältlich sind.  
© Copyright Microsoft Corp. 1981, 1986 Made in Denmark



**Duration?**

**Interface?**

**Network Bandwidth?**

**Latency?**

MALEMU

AOLA

Id

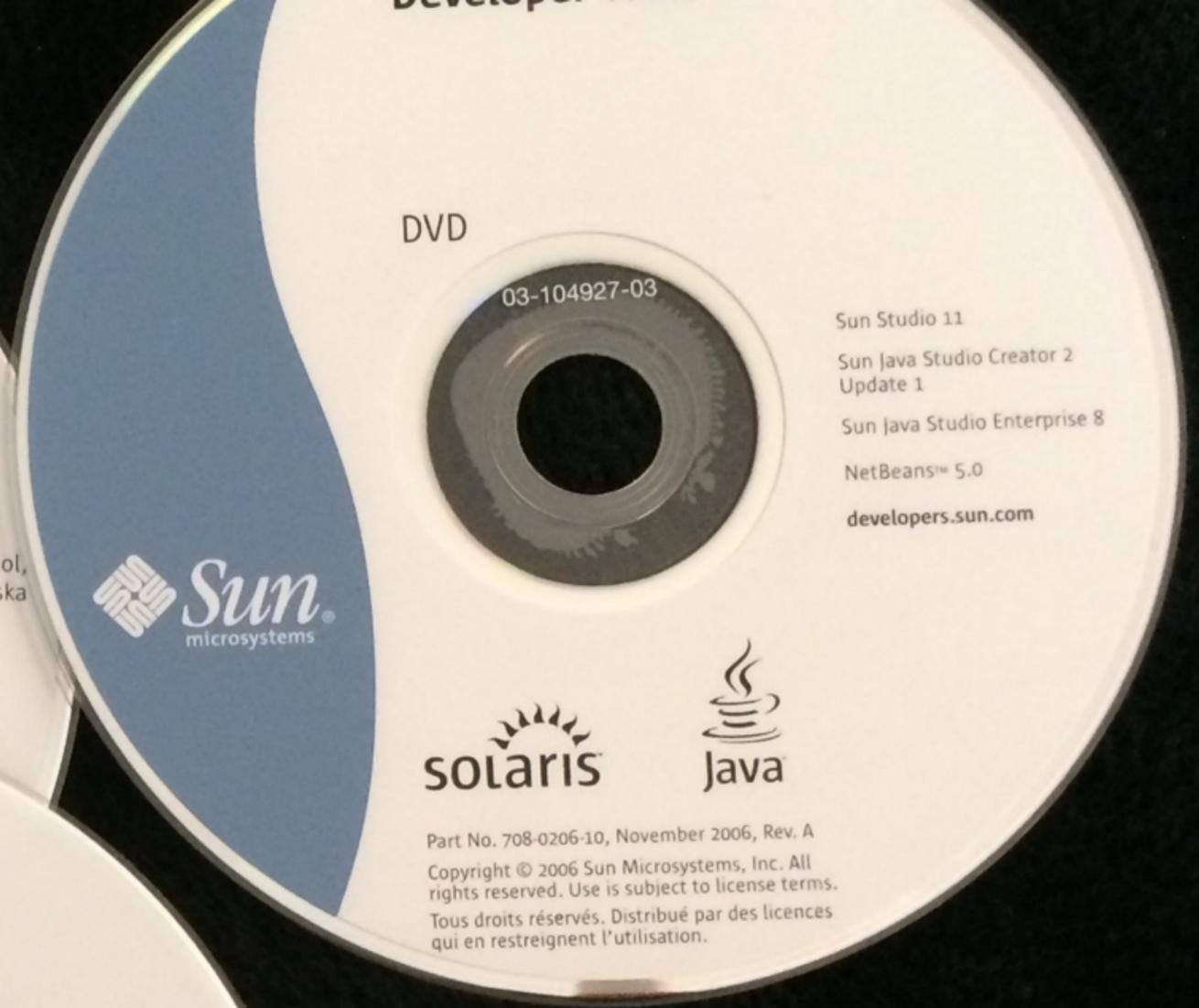
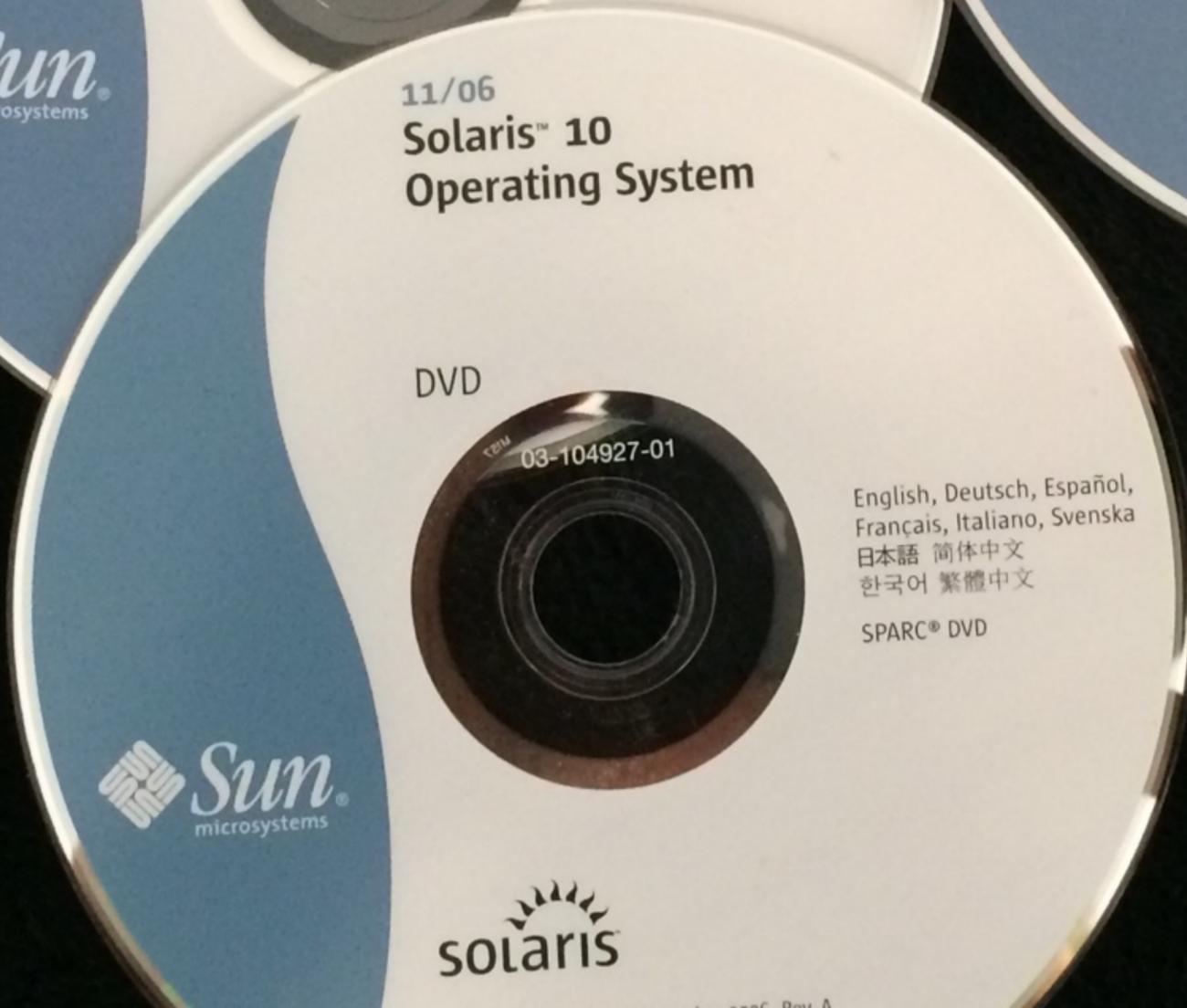
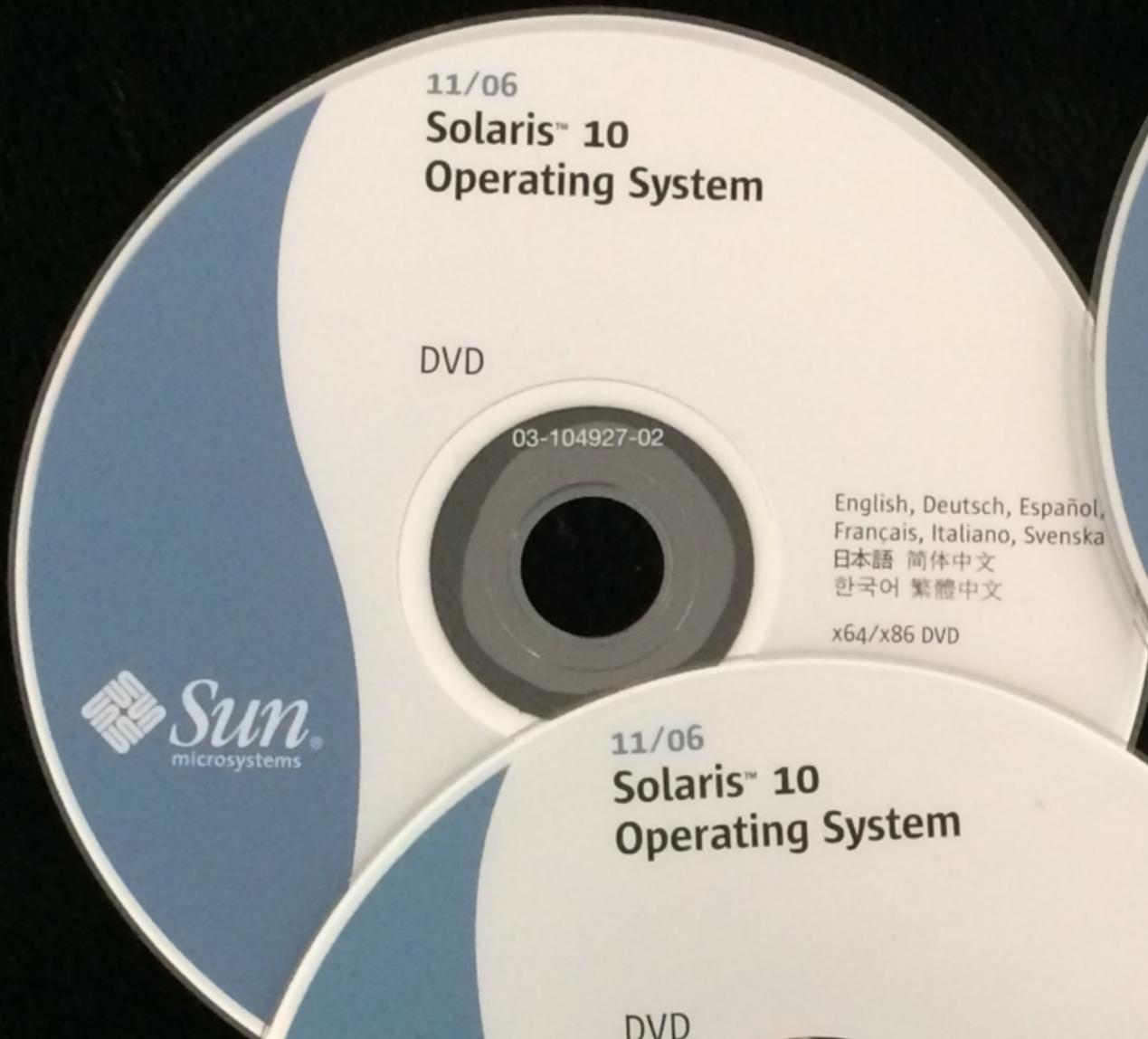
Date

Vol.

ALADIN 7.3 START 7/2

(A COPY: PROT)

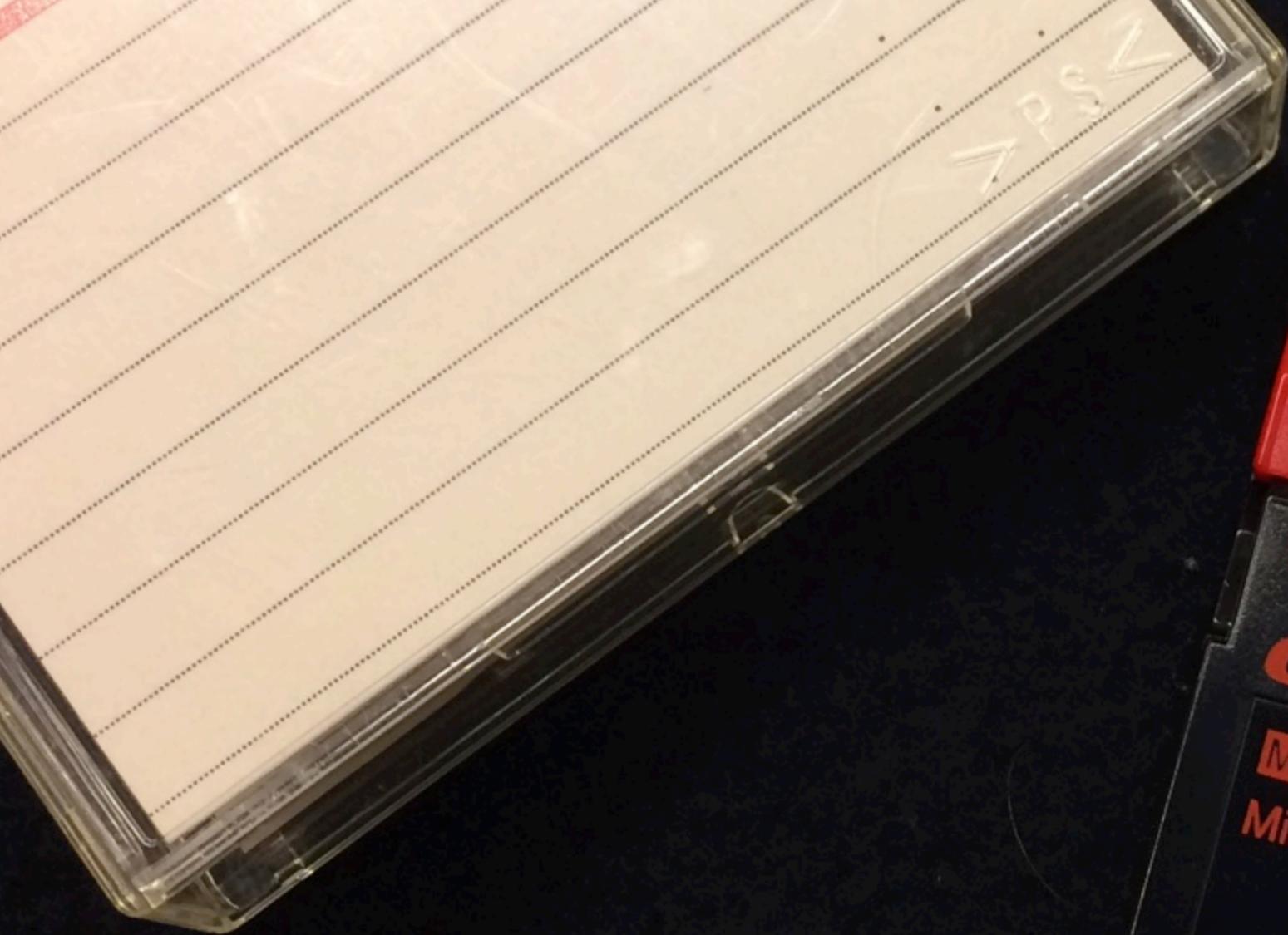
**Where is your data?**



**Where is your backup?**

**Where are your backups?**

**What's your backup media?**



**Is a backup possible?**





Work with  
**GnuPG**

[www.gnupg.org](http://www.gnupg.org)

MA00693440710

1428

# Backup Types

**Full Backup**

**10**<sup>MB</sup>

**FLASHDISK**  
**MASS STORAGE**  
**SYSTEM**

**SanDisk**  <sup>TM</sup>

PCMCIA PC CARD ATA

**Incremental**

# Differential

**Differential and incremental**



**criminal**

**Trust**

# Updates



**Amount per iteration**

Frequency

**RAID**



**Causes**

**Fire!**

**Water**

# Defects



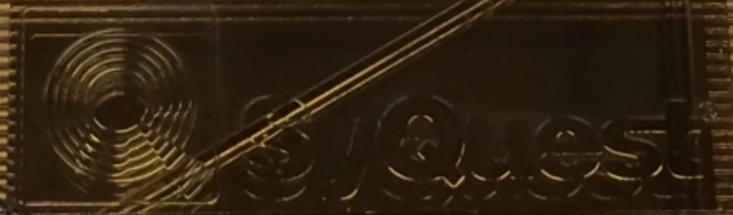
**SyQuest**<sup>®</sup>  
TECHNOLOGY

**200MB**

**5.25" Removable Cartridge**

*Vienna Conference '96*

Apply only one SyQuest approved label. To protect cartridge always store in case.



# Magnetic fields

# Cold deformation

# Surface disintegration

SAFE

**SONY**

**525MB**

DATA CARTRIDGE  
CARTOUCHE DE DONNEES

**QD6525**

310.9 m (1020 feet)



FC  
MADE IN JAPAN

**Theft or Loss**

**Ransomware**

# Deletion\*

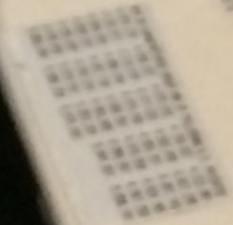
\*) accidentally

B21125

REMOVE THIS LABEL  
DON'T REMOVE THIS LABEL

MODEL M2623FA  
 PART NO. B03B-7195-B115A  
 SER. NO. 18127  
 RATING +12VDC 0.6A. +5VDC 1.0A  
 DATE 1992-12  
 FUJITSU LIMITED  
 MADE IN JAPAN  
 REV. NO. B  
 00376  
 0018127

**CAUTION**  
 DON'T REMOVE THIS LABEL



# Deletion\*

\*) on purpose



**SONY**

MAGNETO  
OPTICAL DISK

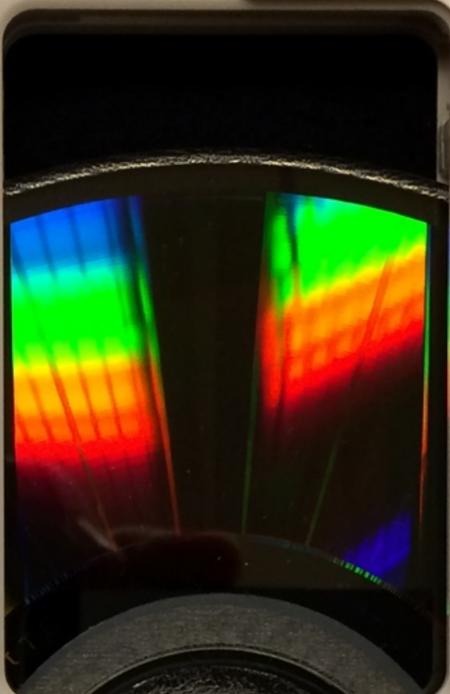
**EDM-1DA1s**

512 byte/sector

**REWITABLE**

side

**A**

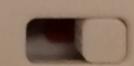


APPLE DEVELOPER DISK

INDEX



DATA PROTECT



# Types of loss

Everything is gone

One medium gone

**Laptop defective**

**Loss of data integrity**

**Restore**

# Testing



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ 1-25 \_\_\_\_\_

\_\_\_\_\_

Preformatted for the Macintosh. Can be reformatted for IBM-compatible

**MAC 1GB**

iomega.

What could possibly go wrong?

Everything!

**Empty Backups**

# Unreadable Backups

**Backup media unretrievable**



# Credentials

# Credentials

Bonus Episode

**Keys**

# Passphrases for Keys

# Physical Media

Verbatim

230 MB

Rewritable  
Optical Disk

230

INDEX

Dig Video -1

Capacity

# Networks

# Controller

RAID, HBA

# Partitioning schemes



**OLYMPUS**



*x-D-Picture Card*

**32MB**



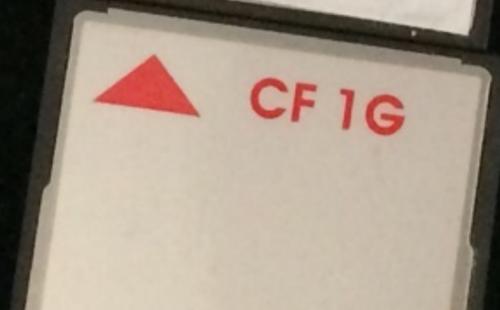
2

# Operating Systems

**Ransomware**

**Integrity**

# Filesystems



# Applications

**UEFI**

# Backup Concept

**3 - 2 - 1 Rule**

# Generations

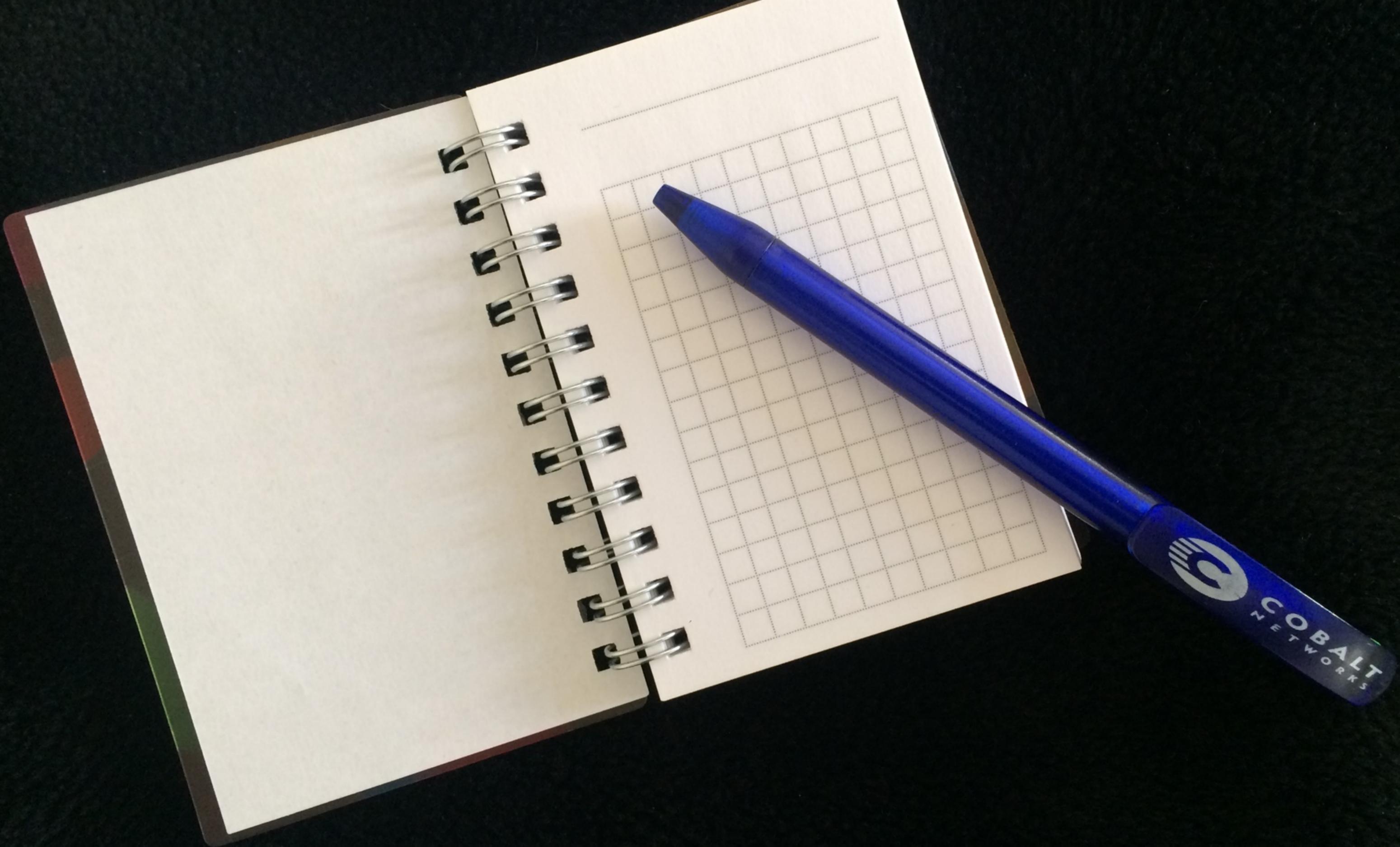
**Test Restore**



**Automate**

**Test again**

**Bootstrappen**



**Questions?**

All photographs are ©MacLemon,  
licensed under CC-BY.

The MacLemon logo is a registered  
trademark.