FDA

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REVISION HISTORY			
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Chapter 1

FDA

1.1 FDA

```
                Future Drive Accelerator V1.4 documentation and newer
**************************************************

Uses the  free memory as a cache , the program reacts automatically on changes
in memory resources, so that you will always get the maximum speed for your
drives. Even "resources-hungry" programs will get enough memory.


Introduction:


                 Concepts
                  The concepts behind Future Drive Accelerator

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                  What you need to use Future Drive Accelerator

                 Benchmarks
                  What speed improvements can be achieved with Future Drive  ↩
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                 Registration
                  If you like the demo...

Usage:


                 Installation
                  How to install and run Future Drive Accelerator

                 Preferences
                  How to configure Future Drive Accelerator

                 View
                  How to quit and monitor Future Drive Accelerator
```

Important informations:

About the program and the author:

For curious people:

1.2 FDA/Concepts

The concepts behind Future Drive Accelerator

****

Future Drive Accelerator is a disk-cache program.

A cache buffers all data which is written or read from the drive (hard disks, floppy disks, Compact-Disk, removable disk, ZIP...).

If requested data is already in the cache, it doesn't need to be loaded from the slow disk.

So far nothing new!

Memory is, as we all know, always short. So you better think twice before you give it to programs. No matter how you set it up, you can never make it suitable for all programs. One program runs (thanks to the cache) faster than ever before, another one stops working (due to the lack of RAM).

With all other cache programs, you had to adjust the memory usage. Of course, the more memory a cache can use, the faster it will work. So with old cache programs the memory usage had been set quite high, but because other programs stopped working this was stopped rather quickly. Now the cache is commonly set to an average size, so that all "memory-eating" programs run. Or you always had to change the cache-size manually to fit the current situation. But this is not a very satisfactory solution. And this is where Future Drive Accelerator comes in.

The whole free memory, whose size is changing all the time, is used as cache.

With this technique, an Amiga with a 68030 50Mhz processor and 16 MByte FastMemory (Blizzard IV) averages a factor 4 speed up. See
Benchmarks
.

Write accesses are buffered, and later, while writing back to the drive, the head is moved from the highest to the lowest address.

Another improvement is built-in for people who use exchangable media like disks, CDs, MagnetOptical-disks and ZIPs. When inserting the media again, the still filled cache is used. The media doesn't need to be accessed again.

Who used a lot of dos-buffers? (1) for the file system, you can now even save this memory.

Not to mention that you help protecting the environment. The motor and the electronics of the drive is used less and thus, energy is saved.
=> the nuclear power plants can be shutted down earlier.
You should also keep in mind that the hardware wears out less.

---------- Footnotes ----------

(1) A dos-buffer requires (per default) a half KiloByte.

1.3 FDA/Requirements

```
                What is required to use Future Drive Accelerator?
***********************************************

   Future Drive Accelerator needs at least:

AmigaOS 2.0
     or better.

2 Megabyte memory, more memory is recommended.
Additionally, the following software is supported:

DiskSafe (http://de.aminet.net/pub/aminet/disk/salv/DiskSafe.lha)
     After a reset or system crash, the cache will be written back before
     restarting the system.

     Example installation for s:Startup-Sequence:
          DiskSafe DF1: DF0: HD0: Store: Font: HD2: HD3: HD4: ... REBOOT QUICKKEY  ↩
             WAITVERIFY VERIFYREQ LOGFILE=Store:T/DiskSafe.log IGNORE
     If this shouldn't work, try adding RESETKEY.

CopyMemQuicker
     See
                Speed up
                .

FileSystems, Devices
     See
                Features
                .
```

1.4 FDA/Benchmarks

```
What speed improvements can be achieved with Future Drive Accelerator?
*********************************************************************

   * Copies 850KB in 35 seconds from hard to floppy disk, this equals the speed
     of formatting. This is possible because, minimizes the overall seek time
     required to read or write data from or to disk. Outstanding I/O requests
     are ordered such that they can all be performed "with one sweep" of the
     disk head assembly, from the highest to the lowest disk address (Elevator
     seeking).

   * 23 MB/s while reading, (SysInfo V3.23) instead of 7 MB/s without cache,
     with an Amiga and following equiment: Zorro III, CyberStorm MKIII, 060/PPC
     604 150Mhz, UltraWide SCSI HD, 64 MB FastMemory, CopyMemQuick 40+.

   * The booting can get twice as fast if there are a lot of small files to
     load and many files reside in the WBStartup directory.

   * Faster access to directories from Workbench.
```

```
   * Amiga MC68030 50MHz, 16MB FastMemory.

        - IDE-HardDisk (tested with DiskSpeed) (1)
              read  6.8 times faster.
              write 8.1 times faster.

        - DD-FloppyDisk (tested with DiskSpeed)
              read  488.0 times faster.
              write 997.6 times faster.

        - Copying from one partition to another.
              44 Dirs, 561 Files = 2.3MB Size
              c:Copy MUI: ASWAP:MUI ALL CLONE QUIET

              Dos  457 Dos-Buffers  46 secs 253999 micros
              FDA    7 Dos-Buffers  11 secs 196642 micros (4.13 times faster)

   * Amiga PPC604 233MHz MC68060 50MHz, 96MB FastMemory.

        - IDE-HardDisk (tested with DiskSpeed)
              read  19.5 times faster.
              write 20.4 times faster.

        - SCSI-HardDisk (tested with DiskSpeed)
              read  3.8 times faster.
              write 3.5 times faster.


  (FDA-Benchmarks.guide)Main   More (graphical) statistics, which have been  ↩
     created using DiskSpeed.

   ---------- Footnotes ----------

   (1) DiskSpeed Reference: 262144 byte, MEMF_FAST, LONG-aligned buffer.
```

1.5 FDA/Tested Systems

```
                Tested systems
**************

     Hardware List

     A4000/40/40Mhz PPC 200Mhz + 64 Fast
     CVPPC + 8Mb
     Zip Drive
     Oktagon Controller
     1.3Gb SCSI II Hard Drive (1 partition)
     4.3GB SCSI III Hard Drive (3 partitions)
     Toshiba 12xCD
     IOBlix Super Fast Serial Card
     Epson GT-6000 Flatbed Scanner
     Pace 56 Voice (V90)(ISP=Wirenet)
     Micronik A4000 Tower case
```

Epson Stylus Color 800
External floppy Drive
Minolta 7000 Camera
External Speakers
MicroVitec GPM 1701 Monitor
Tabby (Drawing Pad)
Sound Sampler
Prelude Sound Card

Software Most Often Used

AHI (music to your ears - registered)
All Experimental PPC Software
PFS2 (So so fast)
CybergraphX V4 (Good with CVPPC)
PPaint 7.1 (It's all in the eye of the beholder)
ImageFX Ver 3.2 (Very stable at this upgrade)
Netconnect (Kiss - Keep It Simple Stupid)
Miami (Works great with my IOBlix)
Turboprint 6.02 (Faster now as it's using the PPC Module)
PageStream 3.3a (I love it)
Organiser (Who am I)
Opus Magellan II (My god, it's full of stars)
CandyFactoryPro (Good PPC Program)
Zip Drivers (Backup my Backups)
HappyDT (Sometimes crashes Netconnect and other programs)
Elastic Dreams (Game for a laugh)
Cyberview (Registered)
Cybershow (Registered)
AK-Datatypes (Registered)
Quicksampler (Good PD)
MultiCX (Registered)
OxyPatcher (Make Those Programs Burn)
MUI (3.8) (Workbench 4 perhaps?)
Kingcon (No two shells are the same)

Relaxing Software Used

Genetic Species
Foundation
Alternate Reality (RPG)
Bane of the Cosmic Forge (RPG)
Bards Tale (RPG)
Quake
UFO
Dungeon Master 1 & 2 (RPG)
Ultima VI (RPG)
Birds of Prey
Theme Park
Civilisation
Syndicate
Doom
Stratego (PD)
Myst
Colonization
Frontier Elite II
Deluxe Galaga

```
Shadow Of The First Moon
VChess
JetPilot
Tiny Troops
Blade (Good Iso RPG)
EaglePlayer (Registered)
MrJQuote

Amiga 1200:
 + 2 880KB Floppys
 + 2 MegaByte 32 Bit Fast-Memory
 + Turbo Jet A1230-BOARD ® Harms Computertechnik
   MC 68030+MMU 14.2 MHz Cache Burst VBR=$0
   FPU68881     15.4 MHz
 + WesternDigital Caviar 2850 (850MB)
   - since I have this HD, I had to slow down my MC68030 from 28MHz to
     14.2 MHz. If anybody knows a solution, I would really like to know.
     See
           Autor
           .



 CPU                :MC 680030 50MHz
 Computer           :Amiga 1200
 OS                 :V 3.0
 Controller         :IDE (Buddha)
 Memory             :16MB FastMem
                      2MB Chip
 FileSystem         :FastFileSystem 44.5
 Hard Disk          :1x Quantum Fireball 3.68 GB
 ZORRO-II-Karten    :1x MultifaceIII, 1x Buddha IDE
 other cards        :Blizzard 1230 (CPU-PORT)
 others             :Micronik Tower mit Zorro II Datherborad
 running programs   :Prometheus V2.6, FKey, MouseBlanker, MultiCX V2.78,
                     NewIcons V40.2, PowerIcons V1.0, SleepingPointers
                     V1.0a, Multifax Spooler V3.1, Killclick2


CS PPC 233MHz, 060 50MHz

A4000 MC68040 25MHz 16FastMem


A3000 CSPPS 604/200 060/50
PicassoII running cybergraphics (will soon be CVPPC)
4 different SCSI harddisks of which 3 are SCSI-2 and one UWSCSI
CSPPC-interface.
DAT-tapestreamer, CD-ROM, 70MB RAM and many things I can't remember.


Amiga 4000 with 68040/40Mhz, about 80MB Fastram, most of it
on the turboboard, and 3,5MB Fast on the motherboard.
2nd.scsi.device / scsi.device / ffs/afs/sfs..


Amiga 1200  040/40 2/32MB 2GB TowerhawkII X2 Multiscan
```

```
     CPU          : MC 68040 40MHz
     OS           : V 3.1
     Controller   : IDE
     Memory       : 32MB Fast, 2MB Chip
     FileSystem   : FastFileSystem 43.19
     Hard disk    : 1 2GB-Platte with 2 Partitionen (50MB and the rest)
     CD           : 1 4fach-CD-Rom (RandyCD-Rom)
     DirOpus5 Magellan is used as Workbench replacement.
```

1.6 FDA/Registration

```
                If you like the demo...
**********************

If you like this demo-version you might want to use the full version which
features:

   * Faster, because the complete free memory is used as cache.

   * Unlimited number of cached drives.

   * And of course no time limit.

Ordering the full version is easy, convenient and comfortable - 24h a day
worldwide!

Prices
   * The full version is available for only 19,99 DM  ($12.99) (11,99 EUR).

   * Minus 5,- DM  (-$3) (-2,60 EUR) if PowerCache, DynamiCache or HyperCache
     can be leased.

   * Minus 4,- DM  (-$2.5) (-2,10 EUR) if you are a student, umemployed or a
     pensioner ;-). Please add some proof. See
                Author
                .

   * Plus  4,- DM  ($2.5) (2,10 EUR) (outside Europe 8,- DM ($5) (4,20 EUR))
     shipping, if you can not receive Email.  See
                Free Email
                . For an update,
     just transfer the money to my bank account.

   * Update 0,- DM  ($0) (0 EUR) if it can be sent via Email.  See
                Free Email
                .

   * Special prices for 10 or more users.  Prepaying of licenses and commercial
     reselling is also possible.  Please contact the author for more details.
     See
                Autor
                .
```

Ordering

1. Online in the World Wide Web (http://shareit1.element-5.de/ ↩ programs.html?nr=102792), SSL encoded.

   * Credit cards

     - Visa
     - Eurocard/Mastercard
     - American Express
     - Diners Club

   * Wire-transfer

2. per Phone, FAX or E-Mail
   * ShareIt service.

     (Program-number 102792)

     -
     FAX
     : +49-221-2407278 (Germany)
     - Phone: +49-221-2407279 (Germany)
     - FAX: +1-724-8508187 (USA)
     - Phone: +1-800-9034152 (USA) free
     - Phone: +1-724-8508186 (USA)
     - E-Mail: <MartinTauchmann@bigfoot.com>

3. US check
   Send $15.5 to the address below, include the program-number 102792.

   ShareIt! Inc.
   PO Box 844
   Greensburg, PA 15601-0844
   USA

4. Eurocheque
   Please fill in the amount in EUR and send to the author .

5. Bank transfer
   Transfer the money in EUR or DM to:

   Badische Beamtenbank eG (Germany)
   76119 Karlsruhe
   Bank Location Number: 660 908 00
   Martin Tauchmann
   Account Nr.: 2473135
   Usage: FDA MC68020 <Your E-mail address>

6. Cash (worldwide)
   Put the money in an envelope and send it to the Autor . (Use an envelope where the money can’t be seen against the light.)

1.7 FDA/Free Email

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Free Email
==========

'http://mail.yahoo.com'
'http://mail.angelfire.com'
'http://www.gmx.de'
'http://www.dejanews.com' (No problems with a "FireWall")
```

1.8 FDA/Free FAX

```
Free FAX
========

'http://www-usa.tpc.int/sendfax.html?destnumber=49 221 2407278'
```

1.9 FDA/Installation

```
                How to install and configure Future Drive Accelerator
*****************************************************

   Please use the included installer script to install Future Drive Accelerator.
The AmigaOS Installer V43.3 is required. This version can be found in Aminet.

Future Drive Accelerator can be started in different ways:

   * Move it to the WBStartup directory, and remove the brackets from the
     tooltype QUIET. (Workbench-Menu ->Pictogram ->Information

   * or insert this line:

     RUN <>NIL: SYS:System/FDA QUIET in the file S:Startup-Sequence after

        - SetPatch

        - SaferPatches
          (http://de.aminet.net/pub/aminet/util/misc/SaferPatches.lha) or SetMan

        - PoolMem See
               NoRamReverse
               .

        - HDOff (not really necessary, but you can then work with the cache when
          the harddisk is off.)
Future Drive Accelerator uses the following Workbench Tool Types and Shell
```

parameters:

FROM (Only from Shell)
     Specifies the name of the configuration file.

QUIET
     Initialising messages are not printed.
     This is useful for an installation in the SYS:WbStartup directory, or the
     S:Startup-Sequence.

1.10 FDA/Preferences

                How to configure Future Drive Accelerator
****

Future Drive Accelerator can be configured using the Future Drive Accelerator
Preference Editor:

                MainWindow
                 The Mainwindow

Windows for configuring drives:

                DeviceWindow
                 The DeviceWindow

Other windows:

                InfoWindow
                 Informations about the drive

   The Preference Editor uses the following Workbench Tool Types and Shell
parameters:

FROM (Only from Shell)
     Specifies the name of a configuration file to load.

EDIT (default option)
     The configuration can be changed.

USE
     The new configuration will be saved temporary.

SAVE
     The new configuration will be saved permanently.

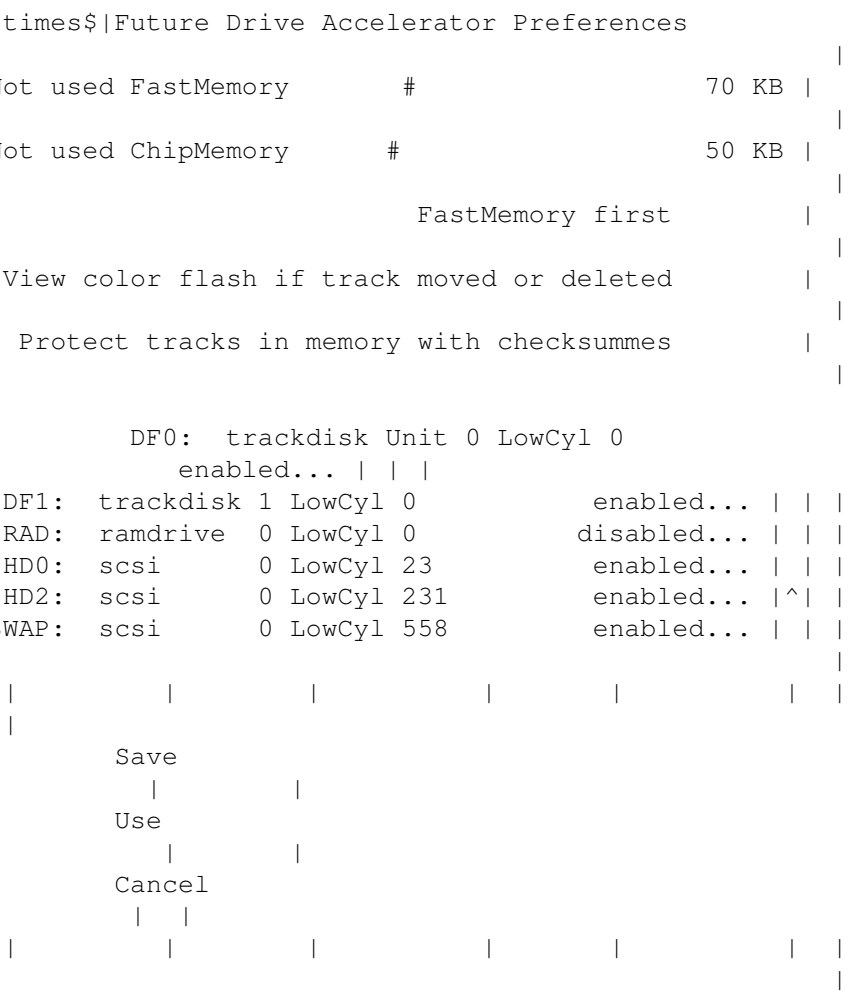
MAINPROGPATH
     Directory of Future Drive Accelerator, e.g. Sys:System/. The configuration
     (FDA.prefs) will be saved to the directory. If Future Drive Accelerator

loaded before ENV: is initialized, which is the case when booting from floppy disk, the config will be found anyway.

1.11 FDA/MainWindow

The Mainwindow
==========

The MainWindow contains a listing of drives. When you select a window, a new window (see
Device Window
) will be opened.



Not used FastMemory
For calibration.
How much of your fast memory shall not be used as cache?
60 kiloBytes is a good value here, because a minimal amount of memory is necessary to send messages. This way, memory can be made available faster.

Not used ChipMemory

For calibration.
How much of your chip memory shall not be used as cache?
100%=No chip memory will be used => which is the fastest setting.

FastMemory first
Off: The cache uses ChipMemory first, then FastMemory.

On: The cache uses FastMemory first, then maybe ChipMemory.

View color flash if track moved or deleted
Off: No color flash is created.

On: There will be a green flash, when a part of the cache is moved in the RAM.
There will be a red flash when a part of the cache is removed from RAM.
Rem.:This option is useful to calibrate Not used Fast- ChipMemory.

Protect tracks in memory with checksummes
Off: The cache is not protected.

On: The cache will be protected from external programs.
Rem.:This is recommended for Intros, games and badly programmed software which change foreign memory blocks. See
Enforcer-write-hits
.
Or if you have bad memory. See
Defekten Speicher
.
Remember: The FileSystem itself calculates checksums. If you get an "Warning!"-Requester with a "checksum-error" , you may not, in no case, press "Cancel", but instead reboot your Amiga at once!
This may also happen without Future Drive Accelerator, but it is not so likely that a program wrote into the dos-buffers accidently.
Dos-buffers just are a "smaller target".

The buttons at the bottom of the window are used to set the path where the config-file will be saved. The name of the file is FDA.prefs.

Save
The configuration is saved to the ENVARC: directory. The new config will be used automatically by Future Drive Accelerator and will survive a reboot. The preferences editor will quit after saving.

Use
The configuration is saved to the ENV: directory. The new config will be used automatically by Future Drive Accelerator but will not survive a reboot. The preferences editor will quit after saving.

Cancel
To quit the preferences editor. All changes will be lost.

Default
What are the default values?

1.12 FDA/DeviceWindow

```
                The Device Window
=================

The following can be set in the Device Window:

When data is written back to the drive, if the data should be verified, how
much data should be pre-read and how much of the cache can be used by this
drive.


      |$\times$|FDAPref Option for  HD0:              |  |
      |                                              |
      |                     Removeable Disk?     |
      |                         Verify write     |
      |                 Write ^| async (fastest) |
      |    ASync delay (seconds)  #            4 |
      |                                              |
      |  Size of Track     #      <>R 43008   |
      |                                              |
      |    Cache usage priority       #        0 |
      |                                              |
      |   |       |    |       |     |        |   |
      |   |
                Enable
                |    |
                Info
                 |     |
                Disable
                |   |
      |   |       |    |       |     |        |   |
      |                                              |

Removeable Disk?
     Does this drive contain a removable disk?
     e.g.: floppy-, CompactDisc-, ZIP, MagnetOptical or SyQuest-drive.

     If Removeable Disk is set to Off, then Future Drive Accelerator does not
     need to know which FileSystem is used, to recognize a disk after
     re-inserting.
     => The initializing of the cache is faster.

Verify write
     The data will be checked if it has been properly written.
     => Useful for floppy-disk and old hard-disks.

Write
        - Through
          Data will be saved at once and moved into the cache at the same time
          (write-retention).
          => When the data is read again, it can be accessed by the cache very
          fast.
```

- Sync
  Like Through with the difference that the data is written to the drive (1) after the writing of the file was completed (2) .
  => The parallel reading and writing is done more gentle in multitasking.
  => The program waits for the end of the write-access (Syncron).

- Async
  Like Sync, but the program doesn't wait for the end of the write-access (ASyncron). What means data is written in an instant.
  => Additionally, minimizes the overall seek time required to read or write data from or to disk. Outstanding I/O requests are ordered such that they can all be performed "with one sweep" of the disk head assembly, from the highest to the lowest disk address (Elevator seeking).

  The cache is written in the background.
  => You can write data to the cache, while the cache is writing to the drive.
  See
  Datasafety
  .

- Late as possible
  Like Async but the data is written as late as possible. This is recommended for Cache-directories of World-Wide-Web browsers or Internetcomputer, where there is (more or less) always data written.

  Data is written when memory is needed or Future Drive Accelerator exits, and, if DiskSafe is installed, before a Reset/System-crash.
  See
  Requirements
  .

- For temporary
  Like Late as possible but data is NOT written before a Reset/System-crash.
  => This is useful for directories whose contents don't need to be the same after the reset, for example: env: t:.

Async delay
For how many seconds shall the write-back be delayed with Async?

Size of Track
Number of bytes a track (3) requires in the cache.
=> How many bytes shall be read ahead?
Reommended values are for harddisks and CDs about 40KB and for floppy disks (2 tracks = 1 cylinder).
If the harddisk is not fragmented, you could achieve a dramatic speed improvement when you set a high value.
If you use two or more harddisks you should use the same value for all unit to avoid the fragmenting of memory. This will be improved in future versions.

Cache usage priority
What priority has this drive compared to other drives for caching?

The buttons in the bottom row of the window can be used to activate or deactivate the cache, and to get informations about the drive

Enable
Cache active.

Info
Shows informations about the drive.

Disable
Cache inactive.

---------- Footnotes ----------

(1) Syncron write-back, or the asyncron delay is started when:
- e.Update-command from FileSystem,
- e.Motor-off-command from FileSystem,
- If a program requests memory, and the cache (the whole RAM) is filled with data that has to be written back.
- Disk removed : "You must replace Volume"
- If DiskSafe is installed : Before a Reset or a Guru.
- or if the cache is full with data to write (at least 7 free tracks)

(2) The end of the write-access is signalled explicit by the FileSystem to make sure that a device, software- or hardware-cache in the hardisk has written the data completely.
Most harddisks have an internal cache of 64 KB.

(3) If only a block (part) of the track is read, the hardware copies the whole track into a buffer and passes on only the requested Block.
Future Drive Accelerator makes use of this behavior: It always reads the whole track into the cache. Reading of a Tracks is a little bit slower than reading a block. slow hardware-head, which would be necessary for reading another block.
=> And the hardware isn't stressed because the requested block is already in the cache.

1.13 FDA/InfoWindow

Informations about the drive
==========

This window shows informations about the selected drive.

Size of Block
can be modified using the HDToolBox(C)AmigaInc. or in the mountfile in the directory Devs:DosDrivers (SectorSize * SectorsPerBlock). But this is not recommend, because most programs depend on a value of 512 here.
No of Tracks
Number of tracks. Is also the capacity of the partition, floppy ... multiplied with Size of Track.

First Track Number
     Start postions of the partition on the harddisk.

Root Track
     Depends on the FileSystem. Is used by Future Drive Accelerator to
     recognize a floppy/removable disk only.

Name and Dates Position
     The position where the partition-name, the date of creation and the date
     of the last modification can be found. Is used by Future Drive
     Accelerator to recognize a floppy/removable disk only.

Unit Number
     Hardware Unit Number.

Device Name.
     Name of the Software-Device.

Buffer Memory Type
     Either Chip- or Fastmemory. If "Need! ChipMemory (slow)" appears here,
     you should get more recent Device-Software, or try to set BufMemType=1 in
     Devs:DosDrivers, because the drive is slower than it needs to be.

4-GByte ``boundary''
     If anything else than "No problems" appears here, then this partition is
     beyond the "4 GB boundary"; you should make sure that you use a FileSystem
     and Software Device that can handle harddisks bigger than 4 GigaByte. See

                FileSystem installation
                .

New Style Device
     Supports the Device-Software the new device standard(C)AmigaInc.?

1.14 FDA/View

How to quit and monitor Future Drive Accelerator
****

Future Drive Accelerator can monitored and exited using
Future Drive Accelerator View:

The monitor accepts Workbench Tool Types and shell parameters:

KILL-FDA
     Writes the cache to the drive (if necessary) and quits Future Drive
     Accelerator.

FLUSH
     Flushes the cache, except for data that has to be written to disk.

UPDATE

Writes the cache to the drive (if necessary).

Future Drive Accelerator View is a by-product, which has helped the author while developing Future Drive Accelerator to find the optimal algorithm (1) for using the cache. The author didn't plan to release this program, but does it now anyway for the curious ones.
Normally, Future Drive Accelerator View is only required to quit Future Drive Accelerator.

The right part of the window shows the current cache structure (sorted). Above this is a summary of the list, how many tracks are in memory and how many of them are waiting to be written to the drive. On the left side you can control how the list should appear.
Finally, at the top, you can see how much of the free memory is used as currently as cache (Avail Memory).

A simplier statistic would be of no use, because the cache is always used at 100%.

Sorted by

Location
Lists the memory areas where the cache-parts reside (2).
The whole cache is listed.
- Location Start position of the track in memory.
- Type Memory Type
- Size Number of Bytes a tracks uses in the cache.
- Track Number of Track. No. 0 is the first.
- Used Number of accesses to the track.
- Old Time (in seconds) since the last access.
- Parti Logical partition- or drive-name.
- DiskName Virtual partition-, medium- or disk-name.

Above this is written how many tracks are in the cache alltogether (all free memory) and how many of that must still be written to the disk.

Track
Lists the cache-parts of a partition, medium or disk.
- Track Number of track. No. 0 is the first.
- Location Start position of the track in memory.
- Type Memory typet.
- Used Number of accesses to the track.
- Old Time (in seconds) since the last access.
- Flags
  * NowBusy Track is read or written.

```
                * MustWrite Track must be written.

          Above this is written how many tracks of the medium (3) are in the
          cache and how many of that must be written to drive.

          The next lines contain
            2. the Unit the medium/partition belongs to, the name of the device
               and the start postion (track-number) of the partition on the
               disk.

            3. logical partition- or drive-name and virtual partition-, medium-
               or disk-name.

            4. When the medium was created (formatted) and the date of the last
               modification. (Only FastFileSystem)

Page Up
     One page up.
     <Cursor left, Shift+Cursor up>.

Page Down
     One page down.
     <Cursor right, Shift+Cursor down>.

Top
     Top of the list.
     <Key T>.

End
     End of the list.
     <Key E>.

Before Medium
     Jump to the previous medium.

Next Medium
     Jump to the next medium.

   ---------- Footnotes ----------

   (1) The used algorithm is required to figure out which tracks is the last in
the queue. This is the oldest track, and if there are several tracks of the
same age, the tracks with the smallest access counter is killed.
If you know a more effective algorithm, don't hesitate and let me know.

   (2) The cache is a summary of different tracks.

   (3) A medium can be a partition, an inserted diskette/ a removable harddisk
/ CD or a removed diskette...
```

1.15 FDA/Copyright

Copyright and other legal stuff

COPYRIGHT

Future Drive Accelerator is shareware. In this case, that means that you need a personalized version of the program to use the full functionality of Future Drive Accelerator.

Users get a personalized version when they have registered with me. This personalized version may not be given to anyone else. To give away the personalized version or to use versions of the program which you did not get directly from me for your personal use, is considered sofware-piracy.

The personalized version may not be transfered, sold or exchanged to another person or organization. It is solely for the use of the registered person.

You may not use any "patches" for Future Drive Accelerator or publish them (regardless whether they are in text, binary or any other form), except with explicit permission by me for the purpose of updating. Using patched or modified versions of this program is considered software-piracy.

NO WARRANTY

There is absolutly no warranty for this software. Although the author has paid attention on security of data, compatibility and speed while developing this software, he can give no warranty that this program is 100% bug-free. You are using this software solely on your own risk. The author cannot be held responsible for any damages or loss of data that may be caused by this program.

DISTRIBUTION

The demo-version package is "freely distributable". It may be copied on any media that is used to distribute free software, for example: FD-disks, CD-ROMs, FTP-server and BBS systems.

The full version is not to be distributed.

No programm, document or file of this software package, partly or completely, may be distributed with another software package without the written permission of the author.

The demo-version may only be distributed complete and unchanged.

To make sure that the archive is its original state, distributors should only use the original archives:

- Aminet: fda.lha (http://de.aminet.net/pub/aminet/disk/cache/fda.lha)
- World Wide Web: fdaupdate.lha (http://home.pages.de/~MartinTauchmann/ ↩ fdaupdate.lha)

Programs and documentation may not be modified The only exception is the use of archiving software like LHA, LZX, ZIP or TAR-GZIP/BZIP2, as long as the files can be restored unaltered.

The is no upper limit for distributions costs (cost for disks, tapes or CD-ROMs, or for duplicating them). Such limits have proven harmful for the idea of free software. In some cases, software has been removed instead of lowering the price of a disk below the limit.

Although the author has not set such a limit, he wants to make clear his opinion on the topic:

* This demo software should be available free to everyone, wherever this is possible.

* If you bought this demo software under normal conditions from a PD dealer on a disk and paid more than 5DM/5$, you have certainly paid too much. Please don't support such practices and try to find a better and cheaper source for your software.

RESTRICTIONS OF USE

Future Drive Accelerator may only be used in the way intended by the author, this means it may only be executed on Amiga-computers running AmigaOS. Reassembling, reverse engineering or translation of the source code is forbidden.

The documentation and the program texts of Future Drive Accelerator are protected by the same copyright as the program itself. This means the documentation or program texts may not be altered or translated.

To avoid any misunderstandings: You MAY NOT translate the texts or documentation for Future Drive Accelerator and distribute them. You must be authorized by me as an official translator. Unauthorized translations of texts and documentation are illegal, harm the copyright and will be removed from public software archives.

No program, document or file from this software package may, partly or completely, be used on a machine which is

* used for the research, development, construction, test or production of weaponary or any other militarical equipment. This includes machines which are used for training purposes.

* used by persons, who accept, support or use violence against other persons (e.g. foreigners).

1.16 FDA/Author

Where to send bug reports, comments and orders?
****

The author can be reached through the following addresses:

Postal addresse:
Martin Tauchmann
Scheffelstr. 49
79102 Freiburg im Breisgau
GERMANY

E-Mail:
<MartinTauchmann@bigfoot.com>

Sometime you can find me in IRC at "irc.uni-stuttgart.de" in the "#amiga"-channel as NickName "Gaddis".

There is also a Future Drive Accelerator homepage in the World Wide Web, with cyberlinks to "Super Find Engines" and many other usefull cyberlinks:

Germany (http://MartinTauchmann.home.pages.de)
U.S.A. (http://bigfoot.com/~martintauchmann/)

The Pretty Good Privacy (PGP) "PublicKey" is available with Finger, or via WWW (http://horowitz.surfnet.nl:11371/pks/lookup?op=index&search=0xF74B8D1D).

ICQ, aka UIN is on my HomePage.

1.17 FDA/Features

Compatibility, Features of Future Drive Accelerator
****

* Accelerates all kind of media e.g.*: Harddisk-, Floppy-, Compact-, ZIP, MagnetOptical- or SyQuest-drives, almost like a RamDrive.

* Uses the free memory as cache , the program reacts automatically on changes in memory resources, so that you will always get the maximum speed for your drives. Even "resources-hungry" programs will get enough memory.

* Minimizes the overall seek time required to read or write data from or to disk. Outstanding I/O requests are ordered such that they can all be performed "with one sweep" of the disk head assembly, from the highest to the lowest disk address (Elevator seeking).

* Gentle, parallel reading and writing in Multitasking.

* Smart-Power-Technologie: Minimizes the number of disk-accesses.

* SmartCache: Read-ahead of blocks.

* When disks are removed, the cache is only removed if necessary. When disks are re-inserted, the cache will be used again.

* No fragmentation of memory. (Opposite to DynamiCache.)

* Can possibly save memory, because dos-buffers are not required anymore.

* Power-LED flashes when accessing cache.

```
* Verify is as fast as in a copy-program, because data is verified in the
  background while writing.  (the processor isn't used much while writing
  anyway).

* If DiskSafe is installed, the cache will be written before a reset or
  system-crash restarts the computer. See
             Requirements
             .

* Supports DiskExpander
  (http://de.aminet.net/pub/aminet/util/pack/epu14.lha),
  Virtual-Memory-Manger (VMM),
  XFH (http://de.aminet.net/pub/aminet/util/pack/XFH.lha) temporal files and
  World-Wide-Web browsers.

* Supported devices: (probably all
     - scsi (http://www.amiga.de/files/index.html), 2nd.scsi, NewStyleDevice,
       atapi (http://de.aminet.net/pub/aminet/disk/misc/IDEfix97.lha),
       cybscsi,

     - trackdisk,
       floppy (http://de.aminet.net/pub/aminet/disk/misc/floppy43.lha),
       diskspare (http://de.aminet.net/pub/aminet/disk/misc/Diskspr3.lha),
       hackdisk (http://de.aminet.net/pub/aminet/disk/misc/NewHackdisk.lha),
       mfm.device ((C)CrossDOS),
       messydisk (http://de.aminet.net/pub/aminet/misc/emu/msh-156.lha),

     - fmsdisk (http://de.aminet.net/pub/aminet/disk/misc/fmsdisk.lha),

     - xpkdisk (http://de.aminet.net/pub/aminet/util/pack/xpkDisk37_8c.lha),

     - cd.

* Supported FileSystems: (All knownn)
     - FastFileSystem(FFS),
       V44.5 (http://de.aminet.net/pub/aminet/disk/misc/ffstd64.lha)
       V43.20 (ftp://ftp.amiga.com/pub/)

     - ProfiFileSystem1+2(PFS)
       (http://de.aminet.net/pub/aminet/disk/misc/pfs95.lha),
       HomePage (http://www.greed.nl)

     - AmiFileSafe(AFS)
       (http://de.aminet.net/pub/aminet/biz/demo/afsdemo159.lha),

     - SmartFileSystem(SFS) (http://www.xs4all.nl/~hjohn/SFS/),

     - MessyFileSystem(MSD)
       (http://de.aminet.net/pub/aminet/misc/emu/msh-156.lha),

     - CrossDOSFileSystem(MSD) ((C)CrossDOS),

     - Berkeley (NetBSD LinUX) Fast FileSystem (BFFS UNI\\02)
       (http://de.aminet.net/pub/aminet/misc/emu/bffs1.3.lha).

  and compatible, furthermore all MultiUser-"clones".
```

* Supports FileSystems with a variable block-size.

* Supports harddisks with a capacity of 4 GigaByte or more.

* Protects partitions beyond the 4 GigaByte "barrier" from faulty accesses.

* Is the fastest cache program. Accelerates harddisks by the factor 2-20,
  floppy disks by the factor 2-997.

1.18 FDA/FileSystem installation

How to use harddisks bigger than 4 GigaBytes.

Type VERSION HD0: into a shell, to find out if version
44.5 (http://de.aminet.net/pub/aminet/disk/misc/ffstd64.lha) or
43.X (ftp://ftp.amiga.com/pub/) of the FastFileSystems is installed.

The new FastFileSystem version (1) must be installed into the RigidDiskBlock (RDB) using HDToolBox. Copying to the L: directoy is not enough. (2)

If you have more than one harddisk on your Amiga, the FastFileSystem is loaded only from the Boot-Unit-HardDisk-RDB. So you have to install the new FastFileSystem into the Boot-Unit; but of course doesn't it do any harm if all Unit-HardDisk-RDB's are updated.

Reformatting of the partitionen is not required, this means the files remain accessible with the
new FastFileSystem (http://de.aminet.net/pub/aminet/disk/misc/ffstd64.lha).
The new FastFileSystem works of course with IDE-drives, too.

How do you update the FastFileSystem?
Start the program SYS:Utilities/HDTools/HDToolsBox:
Select your Boot-HardDisk, 'Partition Drive', 'Advanced Options',
'Add/Update...', now you can see which version is running in your Amiga,
'Update File System...', enter l:FastFileSystem, 'OK', now it should read
Version: 44 and Revision: 5, 'OK', 'OK', 'OK', 'Save Changes to Drive', 'Exit'.

```
                DataSafety
                 What you should know when using ProfiFileSystem-2 and  ↩
                     SmartFileSystem

                SCSIdevice installation
                 Better use for ATA[PI] drives

   ---------- Footnotes ----------

   (1) or SmartFileSystem_SCSIdirect, ProfiFileSystem-2_SCSIdirect.

   (2) FastFileSystem V44.5 is not compatibele with vdisk.device,
statram.device, diskspare.device and fms.device
```

1.19 FDA/DataSafety

```
                DataSafety
==========

The datasafety of the FastFileSystem is extended with Write Async in the case
of a power cut.

The ProfiFileSystem-2 and the SmartFileSystem provide datasafety even in the
case of a power cut, the medium is always "validated".
The medium is kept "validated" by saving the structure-organizing data to the
disk immediatly.
=> You could image this as a tree, whose branches have always to be present,
the leaves (files) may grow or fall off without harming the tree itself.
New leaves are written to the "list of existing leaves" when the completely
grown up. => Of course, files which were saved during the power cut are lost.

   To maintain a valid structure on the medium, the FileSystem must not loose
control about the moment of writing, this means the structure must be written
"syncron".
=> Write Async may not be activated, to ensure datasafety during a power cut.

   Write Async can be activated, if there is enough free memory available to
cache the WHOLE write-process.
=> The medium is always "validated".

   In future versions, using a new FileSystem, datasafety will be maintained
during a power cut, even with low memory, using Write Async.  The important
structure data (tree) is written "Syncron" and the files (leaves) "Asyncron".



                FileSystem installation
                 How to use harddisks bigger than 4 GigaBytes

                SCSIdevice installation
                 Better use for ATA[PI] drives
```

1.20 FDA/Future

```
                What will happen to Future Drive Accelerator?
*********************************************

The oracle foretells:

   * Porting to the new AmigaOS QNX.

   * New memory-routines. See
               Known bugs
               .

   * Better cooperation with PFS-2 to ensure datasafety during a power-cut.See

               DataSafety
               .  Furthermore a speedup, because PFS-2 reads and writes
     directly in the cache.

   * Translating the documentation in several languages.

   * Porting of oo2c (http://www.uni-kl.de/OOC/) to the Amiga, which makes it
     possible, thanks to GNU-C (GCC), to develop Oberon-2 programs for any
     platform. Oberon-2 is almost identical to Amiga E, ADE 95 (gnat),
     Modula/Pascal and Cluster.

   * Porting of Garbage Collector (http://reality.sgi.com/boehm_mti/) to the
     Amiga. Replaces C malloc, C++ new as well as C string (cord) which is used
     for fast string operations.

   * New ixemul.library version.
```

1.21 FDA/History

```
                Development history of Future Drive Accelerator
*********************************************

1.4, Release date 7-Mai-99
        * Brandnew documentation. (Guide, HTML, PS, DVI)

        * Size of Track is now variable.
          => Possible to read more data, before they are needed (read-ahead).
          => No fragmentation of memory, if all Units set to the same Size of
          Track.

        * Support Virtual-Memory-Manger (VMM). Make in VMM-Prefs Code=No
          Data=No Program=FDA.
```

* Fixed, could hang sometimes 1/1.000.000, while writing back Cache.
  Because, AbortIO of the Timer Device of OS3.0 has a bug. The
  Vertical-Blank-Interrupt can jump between the CheckIO and AbortIO of
  the time-request.
  => Now doesn't use AbortIO. Restart the Timer if it came back to
  early.

* Fixed, Checksum-Error, if HD has a capacity more than 2GB (2^31
  "SignedLongWord border").
  Because, Oberon has no support for ULongWord (UnSigned).
  Replaced all DIV in uDIV, and MUL in uMUL.
  IF (highCyl+1) * surfaces > MAX(LONGINT) DIV ASH(SizeOfTrack,-1) THEN
  /* HD > 4 GB */
  Thanks to Timo Murzo (Master.T.M) Sysop of Unity Mailbox Hamm
  Thanks to Michael Kilimann
  Thanks to Denis Zwornarz
  => Current limit is 1126 GB.

* No further translation of SCSI-direct commands into TrackDisk
  commands.
  If FDA is called with a SCSI-direct command, it uses the same command.
  => FFS V44.5 and the special SCSI-direct Versions of PFS-2 and SFS,
  have no limits (1126 GB) about the HardDisk size. See

        FileSystem installation
        .

* If the cache (whole memory) is full of data and any other program
  needs memory, the cache will be written back (flush) and than is
  memory free again.

* Update-Task (writing back) priority is now one higher than Unit-Task
  (read/write).

* Fixed, Enforcer hits.
  Thanks to Michael Kilimann

* Added ChangeInterrupt. CD-Drives need this, to detect a DiskChanges.
  Excluded ´mfm.device´ V40.9 (21.05.93), ´multidisk.device´ and
  ´xpkdisk.device´ V37.8, because they had a BUG while removeChangeInt.
  Device developer: Please, take a look at HackDisk.device
  Assembler-SourceCode.
  Thanks to Marc Michael (yogi)

* Dos-Buffers set to 7.

* Fixed, Dos-Buffers not freed if "QUIET" was used.

* Supported Berkeley (NetBSD LinUX) Fast FileSystem.
  =>protStatus Command detect "Disk Inserted" and Motor off interpeted
  as "update" Command.
  Set the Dos-Buffers of Berkeley (NetBSD LinUX) Fast FileSystem to 456,
  because lower values made read errors (found with DiskSpeed V4.2).

* One timer for one Partition, not only one for the whole Unit.

* Fixed, don't turn off the DiskFloppy motor at some systems.

```
  Motor command is again back in the waiting queue.
  Developer: Imagine, if you're using SendIO instead of DoIO, the
  execution is async not only by reading and writing also with the
  changeState, motor, protStatus, remove, changeNum ... commands.
  Thanks to Herbert Pittermann
  Thanks to Jörg Liebelt

* Spared one uDIV Processor instruction. (A modulation and a division
  in an single uDIV instruction.)
  => Little bit faster.

* Little speed up, if an SCSI-direct FileSystem is used.

* Uses exec.GetMsg only if an Message is available
  (Port.msgList.head^.succ<>NIL).
  => Little bit faster (0.44%-0.51%).

* Fixed, printed -1, at verify requester as Track number.

* Fixed, verify retry.

* Fixed, no error number result if an update error exists in
  Sync-writing-mode.

* Fixed, can't find the icon. <QUIET> Tooltype now working.
  => No window opening, if it's started from WBStartup-Drawer.
  # Thanks to Harald Wünsche

* Windows are now simple-refresh.
  => spares ChipMemory.

* Reduced Stack allocation.

* DSG (Benchmark-Statistics) is now able to read DiskSpeed V4.2
  results, but it can't display values greater than 9.9MB.

* Added Blizzard-IV (030 50Mhz) Accelerate-Card benchmarks in the guide.

* Added PPC604 233MHz 060 50MHz Accelerate-Card benchmarks in the guide.

* Prefrences:
     - Renamed the Options.

     - Removed "Write-Retention off".

     - Replaced "ASync-update-writing" with "Write async = 0 sec".

     - Added "Write as late as possible", for Cache-directorys of
       WWW-Browsers.

     - Added "Write for temporary", for t: env: directorys.

     - Now, quick toggle device with Shift+LeftMouse.

     - Converted "low Track" to "low Cylinder".

     - Device-List gagdget uses the default font, fall back to the
```

topaz.font, if the other text font is proportional or the
default font is also proportional.
Thanks to Andrew Mowatt
Thanks to Frédéric Laboureur (Fred) AlphaSOUND - FANTAISIE
Software (1998)

- Added "Size of Block" of FileSystem in Info.

- Used really New-Look-Menus.

- Fixed, menu "LastSaved" and "Restore".

- Fixed, Argumente "USE" and "SAVE".

- Reinserted "USE".

- Fixed, division by zero trap, if no FastMem available.
Thanks to Flemming Steffensen

- Fixed, division by zero trap, if "blocks per track" or
"surfaces" are zero. (NewPortHandler)
Thanks to Flemming Steffensen

- Fixed, trap if BlockSize<>0.
Thanks to Carsten

- Fixed, no NewStyleDevice detection if anoter unit as zero are
used.

* View:
- View uses the default font; if it's proportional and the size
isn't 8x8, it falls back to the topaz.font.
Thanks to Herbert Pittermann
Thanks to Helge Böhme

- Use New-Look-Menus.
Thanks to Frédéric Laboureur (Fred) AlphaSOUND - FANTAISIE
Software (1998)

- Fixed, bad DiskName if another "Size Of Block" as 512 is used.

* In the Demo Version is writing now possible, but only the half free
memory can be used by two drives as cache.

* Price increased by 4.99DM to 19.99DM.

1.2, Release date 20-Aug-98

* Speed up Read/Write little bit.

* Preferences: ´Not used Memory´ Proportional-Gadgets are now in
Percentage and KiloByte.
Special thanks to Andrew Mowatt

* Better communication between the filesystem and FDA.
Should fix occasional hangings in the previous release.

* Fixed, detect Partitions after 2-GB as 4-GB Partitions. Support 4-GB

```
          HDs is more possible.
          Thanks to Timo Murzo (Master.T.M)     Sysop of Unity Mailbox Hamm

        * Preferences
            - Used New-Look-Menus and scale checkboxes.
              Thanks to Frédéric Laboureur (Fred)   AlphaSOUND - FANTAISIE
              Software (1998)

            - Unnecessary ´Can´t open x.device´ removed, if it is not a New
              Style Device.
              Thanks to Marc Michael (yogi)

        * Nicer looking MWB icons.
          Thanks to Frédéric Laboureur (Fred)   AlphaSOUND - FANTAISIE Software
          (1998)

1.0, Release date 20-Jul-98
        * Added SmartFileSystem benchmarks in the guide.

        * Write operation a little bit faster.

        * Fixed, StartUp RangeCheck trap, if Size of Track > 131072.

        * Dos-Buffers set to 20.

        * Supports NewStyleDevice: (NSD) 64-Bit Commands (4GB border).

        * Supports scsiCmd (4GB border).

        * Preferences
            - Include more "big" HDs.
              Thanks to Timo Murzo (Master.T.M)     Sysop of Unity Mailbox Hamm

            - DeviceCompatible removed.

0.98, Release date 04-Jul-98
        * Supports Partitions after the 4GB border (not tested).

        * Speedup Read & Write operations.

        * Preferences
            - Includes LateBinding-Devices.

            - Preferences: Removed bugy "USE".

0.96, Release date 25-Mar-98
        * First puplic release @ the AmiNet.
```

1.22 FDA/Other Products

```
Other products
**************
```

From the same author:

* Future Copper Producer (http://de.aminet.net/pub/aminet/gfx/edit/FCP.lha)
  - Convert Pic -> CopperList (6BitPlane -> 0 BitPlane CopperList)

  - CopperListEditor

  - CopperListSearcher

  - Full Modula-2 SourceCode

* Telekom Bill (http://de.aminet.net/pub/aminet/comm/misc/TelekomBill.lha)
  German Phone-Bill calculater for WG´s

* Active Window Picture (http://de.aminet.net/pub/aminet/gfx/show/ActiveWinPic. ↩
  lha)
  displays pictures in any window, especial SHELL.

* File 2 Partition (http://de.aminet.net/pub/aminet/misc/unix/File2Partition. ↩
  lha)
  Spares memory if LinUX is installed, stores files direct to HD, Disks or
  any LogicalDevice

* Is Inserted? (http://de.aminet.net/pub/aminet/util/boot/IsInserted.lha)
  StartUp-Check if a Disk inserted then start BootUte, or any ...

* BrainBird (http://de.aminet.net/pub/aminet/mods/slow/BrainBird.lha)
  Shaman drums to meditate and 14 Ambient/NewAge/Music concrete Songs.

* Exec.library disassembly (http://de.aminet.net/pub/aminet/dev/asm/ExecDis.lha ↩
)
  A commented disassembly of the exec library 1.2.

* PasTeX ShowDVI-SuperHighRes EpsonMedium/Low (http://computer.freepage.de/ ↩
  tauchmann/PasTeX-SuperHighRes.lha) (5.1 MB)
  SuperHighRes & Epson medium pk-fonts, other resolutions possible.
  => Display 9PinPrinter "Quality" on Screen.

From other authors (in Aminet):

* Better Amiga feeling
  - Copper-rainbows on ALL pubscreens (http://de.aminet.net/pub/aminet/util/ ↩
    wb/Copper-Demon.lha).
    Needs ScreenNotify.library
    (http://de.aminet.net/pub/aminet/util/libs/ScreenNotify10.lha),

  - PersonalPaint (http://de.aminet.net/pub/aminet/biz/cloan/PPaint64.lha)
    AnimBrush (16 colors) as Mouse-Pointer
    (http://de.aminet.net/pub/aminet/gfx/aga/AnimPoint10.lha),
    needs AGA/3.0 needs QMouse
    (http://de.aminet.net/pub/aminet/util/cdity/qmouse290.lha)
    to blank pointer, because MultiCX can‘t do it.

  - Animated Busy Pointer Hack (http://de.aminet.net/pub/aminet/util/boot/ ↩
    pointerx.lha).

- Time and Mem (ftp://ftp.uni-stuttgart.de/pub/systems/amiga/amok/amok080/ ↩
  TimeAndMem.lha)
  in the Shell-Prompt.

- AntiTopaz (http://de.aminet.net/pub/aminet/util/misc/AntiTopaz.lha)
  Substitutes topaz with system default font.

* Relax Music
  - DI-* "MagneticNorth" (http://de.aminet.net/pub/aminet/mods/slow/DI-*.lha ↩
).

1.23 FDA/Credits

```
                The author wants to thank...
*****************************

   The development would have been impossible without the feedback of some
Future Drive Accelerator users. Many ideas and features came from these
sources...

So I'd like to thank the following persons:

For  Alpha-/Beta-Tests, ideas & bug-reports:
     Frédéric Laboureur, Michael Kilimann, Denis Zwornarz, Andrew Mowatt, Marc
     Michael, Herbert Pittermann Kisses for you sweet Kids, Harald Wünsche,
     Timo Murzo, Jörg Liebelt, Flemming Steffensen, Helge Böhme, Andreas,
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     The Amiga Translators Organization (ATO) (http://ato.vapor.com)
     Jens Neubauer <jens.neubauer@gmx.de>

For proofreading:
     Gregor Knechtges
     Heiko Hayn <Smeagel@gmx.net>

Malcolm Harnden
     For supporting the PPC Amiga.

Fred Fish
     Without your excessive commitment for the Amiga, I hardly would have gotten
     those bits and bytes to feed my curiosity. Your new GeekGadget
     (ftp://ftp.unina.it/pub/amiga/geekgadgets/amiga/m68k/snapshots/current/)
     Project with the GNU ports is very praiseworthy.
     The text you read at the moment has to be partly credited to Fred Fish
     because it is written in Texinfo.

Reinhard Spisser and Sebastiano Vigna
     for the Amiga-port of "makeinfo".

Michael Marte, Hamish Macdonald, Geert Uytterhoeven, Chris Lawrence,
     Joerg Mayer, Martin Apel, Richard Hirst, Roman Hodek, Thomas Kruse,
     Benjamin (Benni) Lorenz, Odd-Jarle Kristoffersen, Jes Sorensen, Ron Flory
     ...   (MC 680xx LinUX)
```

I can’t find words.

Kamil Iskra, Philippe Brand, Fred Fish, Leonard Norrgard, Hans Verkuil, Gunther Nikl, Anders Wegge Jakobsen (GNU C Compiler)
You made it possible to program for every platform.

Dirk Busse (CopyMemQuicker)
Thanks to your optimising, the cache has become even more faster. See

Speed up
.

Matthew Dillon
Without your DME (programable text-editor) maybe I had never started typing.

Friedjof Siebert
Without your damn-fast Oberon-compiler, it would have been only half as much fun.

Amiga Modula Oberon Klub Stuttgart AMOK
Your enthusiasm dragged me on. Where do you get all these good ideas from?

Niclaus Wirth
Brought light into the darkness, finally one can read the programs.

Jonathan Potter
Please stay with us. From ScreenX to DOpus, you evolved very much.

Ralph Babel
Very dry, interesting book, in which sect are you now?

Commodore, AmigaInc. ...
Don’t dare to drop the Amiga like the Hippis the ‘68er. The Amiga is the Harley among the platforms.

Telekom
He, I still don’t have a modem.

Quasar (White Box), CodX (Dialer/UnlimitedAcces)
Really clever how you fooled the Telekom back then.

William Gibson
Great books, I still don’t understand one word.

William Gaddis
Master of the dialogue, pity that your time is over.

Nico François
PowerSnap is just great! RequesterTools anyway. PowerPacker was a must in times when buying a harddisk costed a fortune.

Georg Hörmann XFD
Fixed the old bugs in the decrunchers.

ASDG FACC
Your FloppyAccelerator inspired me.

TURBOBRAIN (D-Copy)
     Your D-Copy (http://de.aminet.net/pub/aminet/disk/misc/DCopy31.lha)
     finally brought X-Copy to an end.

Georg Heßmann
     Your PasTeX made the Amiga able to print.

? SoundTracker+
     The author is unknown, so I just thank
     Tracer and DOCTOR MABUSE and UNKNOWN of D.O.C and MnemoTroN / Silicon
     League,
     TIP of THE NEW MASTERS.

BAMIGA SECTOR ONE, RED SECTOR ...
     Great intros, just very old.

Kai Nickel (MathX)
     Another remnant of AMOK. Abitur (school leaving examination) is
     impossible without your program.

TRIAD (TitanicsCruncher)
     Without your cruncher, one would have to buy RAM all the time.

Bert Jahn WHDLoad (http://www.fh-zwickau.de/~jah/whdload/), Jean-François Fabre ↩
   JST (http://perso.club-internet.fr/jffabre/amiga/patches.html)
     Good work, finally the classic games work with AGA, too, and can be loaded
     quickly from the harddisk.

BullFrog (Populous, Powermonger...)
     It is real fun to play god.

John Matthews (MultiPrint)
     What did I have to suffer from print-programs until I found yours! Well,
     the handling could be easier.

BootX VirusX VirusZ ...
     I believe it was you who killed these poor viruses; and if not you, then
     it was OS2.0.

Zeitschrift Computing C-16
     I find it impossible to print programs on dozens of pages, which you had
     to type into your computer to play something.

Commodore C-16 PLUS 4
     Was fun, especially because you could press some keys and break and
     disassemble and debug any given program.

Forum InformatikerInnen fuer Frieden und gesellschaftliche Verantwortung FIFF e.V.
Pretty Good Privacy PGP
     Thanks for telling the people about the governmental fooling.

Michael Sinz (MKSoft Development), Bryce Nesbitt
     Without DiskSpeed, no one had told me it was getting better.
     The Enforcer is absolutly necessary for debugging.

Martin Mares (MJSoft System Software)

Your Resident Module Launcher, and SKick are really good, now you don't have to buy several ROMs each time.

Valenta Ferenc (Copper-Demon)
Great feeling.

Sylvain Rougier (ParM)
Your ParM is my ToolManager.

Stefan Becker (ToolManger)
I used the structure of your documentation.

Richard Körber (PatchWork)
See
Known Bugs
.

Thomas Richter (SaferPatches)
DiskSafe (http://de.aminet.net/pub/aminet/disk/salv/DiskSafe.lha) is a nice little tool.
Your
SaferPatches (http://de.aminet.net/pub/aminet/util/misc/SaferPatches.lha) solved the problem!

Harry Sintonen (HackDisk)
Your HackDisk assembler-sourcecode answered my questions.

Urban Dominik Müller, Dirk Stöcker, Bryan Ford and Christian von Roques
Your XPK-system is without competition.

all users who decided to register Future Drive Accelerator.

1.24 FDA/Speed up

How to speed up Future Drive Accelerator even more
****

So you can make Amiga faster.

Install a CopyMem(Quick) (1) Replacement for your processor type:
68000 (http://de.aminet.net/pub/aminet/util/boot/COPMQR28.lha)
68020 (http://de.aminet.net/pub/aminet/util/boot/CMQ030.lha)
68040+ (http://de.aminet.net/pub/aminet/util/boot/CMQ060.lha) The MCP replacement shouldn't be used, because it is slower than these versions.

Set the SCSIsynchron-Flag in the RigidDiskBlock of your boot-harddisk with RDBFlags (http://de.aminet.net/pub/aminet/disk/misc/RDBFlags-1.3.lha).

Don't use ChipMemory as cache, and set not used ChipMem in the preferences, to 100%. See
Das Hauptfenster
.

If you use the program PoolMem, start it with the argument NoRamReverse.

SCSIdevice installation
Better use of ATA[PI] drives

TurboBoards
General speedup for turboboards

---------- Footnotes ----------

(1) CopyMem(Quick) is used to copy data between cache and system memory.

1.25 FDA/SCSIdevice installation

Better use of ATA[PI] drives
==========

You don't have AmigaOS 3.1 and want to install the newest update of the (1) scsi.device (ftp://ftp.amiga.com/pub/) to get a better performance? (especially together with ATA[PI] drives)

Attention! There is no guarantee for this hack. (2) The modified file may not be distibuted.

The hack works on an 1200 with OS 3.0.

1. Rename the file a300.ls.strip, if you use an Amiga 1200 (3) , to scsi.device, and copy it into the Devs: directory.

2. Load scsi.device V43.xx into a file-monitor:
   Search for $0C6C0027. The next value is $0014 6516. Replace $6516 by $6026.

3. Get
   AddModule (http://de.aminet.net/pub/aminet/util/boot/NewAlertH.lha).
   In the first line of your s:Startup-Sequence write:
   RUN <>NIL: c:AddModule <>NIL: DEVS:scsi.device CLASS 1 PRI 10 INIT ;V43
   CLASS xoper e flags

After the second reboot, the new scsi.device is loaded.

---------- Footnotes ----------

(1) The hack als works with FastFilesystem V43.20 (ftp://ftp.amiga.com/pub/)

(2) The hack removes an alert which informs the user that no OS3.1 is installed.

(3) If you have another Amiga, please read the readme text in the update-archive, to find out which file is the best for you.

1.26 FDA/TurboBoards

```
General speedup for turbo boards
================================

You have a turbo board, e.g. a Blizzard-IV with Extra Fast Memory?

Is the exec.library "function-jump-table" (AVL) in the Chip Memory? (Can be
found out using XOper or FastExec.)

Get FastExec (http://de.aminet.net/pub/aminet/util/boot/FastExec29.lha).  Start
it with:
FastExec SysInfo

   Is the output for SysStkUpper $XXXXXXXX a value greater than
$00200000 if you have 2MB ChipMemory, or
$00100000 if you have 1MB ChipMemory?

   If not, then the ``supervisor stack'' is in Chip Memory. This slows down the
"task-switching".

   Insert this line in your s:Startup-Sequence, after AddModule (if present):
FastExec REBOOT FASTSSP FASTMEM
```

1.27 FDA/Mark Bad Memory

```
How to use bad memory
*********************

Do your programs crash randomly?

   Then your RAM-modules may be faulty. Especially PS-2 (SIMM) modules are very
vulnerable to "static electricity".
Or you have some unused RAM-modules laying around?

   No need to worry, like on a harddisk, you can mark bad memory and exclude it
from usage.

   But first we have to know where exactly the memory is faulty. For this
purpose there is an excellent program called
MemTest (http://de.aminet.net/pub/aminet/util/misc/MemoryTest.lha), which
should be started without booting (as much free memory as possible).
Beforehand, the "DataCache" of the CPU should be disabled with
     CPU NODATACACHE NODATABURST NOEXTERNALCACHE
    . Now start the "Rotate 32" test and save the result.

Now get Allocate (http://de.aminet.net/pub/aminet/dev/misc/allocate.lha).

Insert at the beginning of your S:Startup-Sequence:
```

```
     resident c:Allocate pure
     Allocate <>NIL: 68900000 100000
     Allocate <>NIL: 68B00000 100000
     resident Allocate remove
```

   The hexadecimal addresses should, of course, contain the bad memory areas. (Be generous, don't be stingy with a few 100KB or MB (depending on the chip).)

This works with LinUX, too:
Create a file, where you insert all areas which work 100% okay. For example

```
     2097152
     0x68000000 9437184
     0x68A00000 1048576
     0x68C00000 3670016
```

   and start AmiBoot with -m FileName.

1.28 FDA/OS more reliable

How to make the Amiga more stable
****

Do your programs crash with a Guru 4 (Instruction error) or $1000005 (Memory corrupt) ab?

   The reason could be a too small stack. Every System has a different stack usage, because different programs run in the background, and change system-routines.

   If several programs change the same system-routines, this may result in an stack overflow
   - which can destroy the free-memory-list,

   - or the return address of a subroutine is gone after a task-switch,

   - or even other programs are changed accidently (Enforcer/CyberGuard-Hit). Even if only one program changes a system-routine and doesn't use stack itself, there are at least 4 Bytes used.

Luckily there is
StackAttack (http://de.aminet.net/pub/aminet/util/boot/StackAttack.lha), Which gives almost every program a little more stack.

   example installation in the s:Startup-Sequence:

```
     StackAttack ADDSTACK=512
```

1.29 FDA/Known Bugs

Known bugs
****

If your think you found a bug in Future Drive Accelerator, please send a description see
description
to the author see
Autor
.

Here is a list of known bugs and problems:

Bugs:

* ABackUp has a problem with the RAM-Disk patch of Future Drive Accelerator V1.4.
  => If a file is packed with XPK and there is no space in the RamDisk, ABackup thinks the file is 2GigaByte large.
  Will be fixed in the near future, when the author has completly rewritten the memory-routines.

* AvailMemory(largest) gives a value that is too small.
  => There is a larger continous block; so "not used FastMemory" can be set tof 1%.
  The real value can be determined if you start Avail from the shell, then quit FDA, and again start Avail.
  Will be fixed in the near future, when the author has completly rewritten the memory-routines.

* If the "Size of Track" is different from disk to disk, the memory will be fragmented.
  Will be fixed in the near future, when the author has completly rewritten the memory-routines.

Not real bugs:

* If Not used ChipMemory, see
MainWindow
is set to 100%, no track can be
  moved to make room.
  => The track is removed from the cache.
  Will be improved soon, when the author has rewritten the memory-routines.

* Doens’t support AbortIO,CloseDevice yet.

* Supports, but not optimal, AllocMem(reverse).
  => AllocMem reserves a memory area which is the last free. Normally this is in an early region, because the cache is behind. See
Installation
.
  Will be fixed in the near future, when the author has completly rewritten the memory-routines.

* ViNCEd V3.63 doesn’t use AllocEntry or AllocPooled from exec library, to maintain an own poolmemory, to bundle small memory allocations. (It replaces AllocPooled with an own routine.)
  => The cache is very often flushed unneccesary. That’s a pity, because for instance the horizontal scrolling is a nice feature.
  KingCON V1.3 makes no problems.

Will be fixed in the near future, when the author has completly rewritten the memory-routines.

* vdisk.device 2.7 (C) 1994-1997 by Etienne Vogt (like ramdrive.device)
  Doesn't work together, because vdisk does not use OS-memory functions. Is not that tragic, because it doesn't support FastFileSystem V44.5, too.

Future Drive Accelerator has been tested intensively with Enforcer/MungWall and PatchWork.

Patchwork has helped to figure out two very resistant bugs.

* CopyMem(Quick)
  size must not only be LongWordAlligned (size MOD 8=0), but also Destination & Source. The bug appeared only after several 1000 times and caused chaos in memory.

* CopyMem(Quick)
  "memory areas are overlapping (incremental)" seemed to work, but sooner or later, there will be chaos in memory, too, at least with CopyMemQuickerV2.8. This doesn't mean that CopyMemQuicker is not a good program. See
  Speed up
  .

Problems of other cache-programs

* PowerCache
  * Has caused checksum error while writing, because Read/Write request are not put in a queue. Especially because the settings are saved to late before a reboot.
  * Cache usage is not flexible.
  * Doesn't re-use the cache when reinserting a disk.

* DynamiCache
  * Does not support Write Async.
  * Does not support SCSI-direct-FileSystems.
  * Does not support harddisk with more than 4 GigaBytes.
  * Doesn't re-use the cache when re-inseritng a disk.
  * Fragments the memory extremely.
  * Does not support AllocAbs and Allocate to free the cache for other programs.
  * If flush is executed (memory full), the cache is deleted, although the memory is not too short anyway.
  * Does not cache accesses from ArtStudioPro 3 and Imagine.

New Bug
Have you found a new bug?

```
                DebugFiles
                 Programs to aid the debugging
```

1.30 FDA/New Bug

```
                New bugr
========

  1. Which version do you use?

  2. What was set in FDAPref, see
                FDAPref
                ? (Removeable Disk?, ...)

  3. What says FDAPref, see
                InfoWindow
                , about the non-functioning partition?

  4. If other programs do not work as they should, do they without FDA?

  5. If DOS-checksum (Read/Write) error occured, please activate FDAPref
     <Protect tracks in memory with checksummes>, see

                Protect tracks in memory with checksummes
                .  If FDA reports checksum
     errors, it is not a FDA BUG. Or try to install another FileSystem, if the
     harddisk has more than 4 GigaByte capacity. See
                FileSystem installation
                .
     Or remove static dust from your RAM-modules. See
                Mark Bad Memory
                .

  6. How did the bug appear? How can it be reproduced?

  7. Which hardware/software (Mem, OS, FileSystem, Device-Software) was used?

  8. Was there a Guru-alert (error messages)?
     In FDA are Guru-number (error messages) built-in. These start with
     $0FDA00##.

     If there was another number, please start SegTracker from the
     Enforcer-package. Start Tnt or if possible Enforcer or replacement
     programs like CyberGuard (MC68060).  Wait for the bug to show up again.
     Write down the error message.
     SegTracker is important because the author would like to know when the BUG
     occours. See
                DebugFiles
                .

  9. If something like this appears, please start Segtracker before.
           Guru #0005: Division durch 0
```

```
Dx 00007FFF 00000000 08C6FFFF 00000000  7FFFFFFF 00000000 081AAE54  ↩
   00000000
Ax 081AADEC 08C5F9D6 08C5F9DA 08C5F88A  081AAE54 08C5FC34 08000AB0 08 ↩
   C5F820
segment FDAPref
hunk       0
offset  0000365E
sr 0000
pc 08C553E6
<RETURN>
```

DebugFiles
SegTracker, Enforcer und Co.

1.31 FDA/DebugFiles

```
SegTracker, Enforcer und Co.
----------------------------

Please read on if you have a processor with MMU, or want to know whether you
have.

Needed files
Enforcer supports MC68060 (http://de.aminet.net/pub/aminet/dev/debug/enforcer.lha) ↩
   ,

CyberGuard supports MC68060 DisASM (http://de.aminet.net/pub/aminet/biz/p5/68060- ↩
   V44_3.lha),

MungWall to detect Bad written Programs (http://de.aminet.net/pub/aminet/dev/debug ↩
   /Mungwall37_64.lzh).

needed to display output (Virtua Terminal) (Work also if the MultTasking
is switched off), a replacement for Sushi (http://de.aminet.net/pub/aminet/dev/ ↩
   debug/MungFriend.lha).
How to run Debugging-Tools?
     SegTracker (Needed for locate (Hunk-offset) the bug)
     RUN Devel:Debug/Enforcer/SegTracker

     Enforcer
     MultiCX/RebootOff (if MultiCX is running)
     RUN Enforcer SHOWPC VERBOSE DEADLY STACKCHECK AREGCHECK DREGCHECK RAWIO
     (need MungFriend)
     RUN Enforcer SHOWPC VERBOSE DEADLY STACKCHECK AREGCHECK DREGCHECK
     FILE=CON:0/0/640/100/Enforcer/Auto/Close
     LawBreaker (Any Output? Yes the MMU is working.)

     CyberGuard
     RUN CyberGuard SHOWPC VERBOSE DEADLY STACKCHECK AREGCHECK DREGCHECK
     FILE=CON:0/0/640/100/CyberGuard/Auto/Close PCLINES=4 SHOWDISS
```

```
     LawBreaker (Any Output? Yes the MMU is working.)

     MungWall (Detect bad written Programms (CheckSumme-Error))
     RUN MungWall INFO SHOWFAIL SHOWPC SHOWHUNK SHOWSTACK NAMETAG

     Start Output Display Buffer (Virtual Terminal) (MungFriend ON RawSer->CON:)
     RUN Devel:Debug/MungFriend INSTALL SIZE 40000 trace flash nobells noserial

     Convert, only, GuruNumber in Hunk-offset, doesn't need an MMU.
     Devel:Debug/Tnt FORCE

How to show the output?
     MungFriend Type to Window
     Devel:Debug/MungFriend
     >CON:0/0/696/200/MungFriendSerOutput/Auto/Close/Wait/SHELL TYPE

     MungFriend Write to File
     Devel:Debug/MungFriend Write `RequestFile DRAWER=SYS:T/
     FILE=SerialOutput.txt TITLE="OutputFile"`

     MungFriend Clear
     Devel:Debug/MungFriend CLEAR

     MungFriend Info (Is any inside?)
     Devel:Debug/MungFriend INFO

     MungFriend ON RawSer->CON After Reset/Dead-GURU: (OutPut is still alife)
     Devel:Debug/MungFriend update trace

     MungFriend OFF
     Devel:Debug/MungFriend REMOVE
```

1.32 FDA/Technical

```
                Technical data
**************

For curious people, who want to know everything.

   * In Exec-Library are patched AllocMem (AllocVec, AllocPooled, CreatePool),
     Allocate (AllocEntry), AvailMem, AllocAbs and in the Device BeginIO.

   * Memory for the tracks is reserved decreasing (reverse).

   * The program was written in Oberon-2 and Assembler.

   * One track requires 16 Byte in the cache-structure.

   * Using Verify, memory of the size of one track is required per device.

   * The TrackDisk64 and SCSI-direct commands support "only" 40-Bit
         2^40 =        1,0995 TeraByte   1125,9               GigaByte
         2^64 = 18446744,074  TeraByte      1,8889465931776e10 GigaByte
     The calculation is carried out with a "fast" 32-Bit division.
```

1226 GByte Festplatten will not be available until the 3rd millenium (by todays standards).

* Only an offset which is divisible by 512 can be used. It would be possible to implement something else, but SCSI-drives don't support it anyway and there is no known program that doesn't read/write whole blocks (512 Bytes), so we can save a few bus-cycles here.

* These device commands are understood:

include:exec/io.h
read, write, update,

include:devices/trackdisk.h
format, extFormat, extRead, extWrite, rawWrite, extRawWrite, extUpdate, motor, extMotor, protStatus, getGeometry, getDriveType, getNumTracks, eject

trackdisk64 (http://de.aminet.net/pub/aminet/dev/misc/trackdisk64.lha)
read64, write64, format64

NewStyleDevice (NSD)
read64, write64, format64

Is used by FastFileSystem V43.x (ftp://ftp.amiga.com/pub/). => No problems with harddisks bigger than 4 GigaBytes anymore. See

How to use 4 GigaByte harddisks
.

Informations about these commands can be found here:
NSDDocs (http://www.amiga.de/files/index.html)
NSDPatch (http://de.aminet.net/pub/aminet/disk/misc/NSDPatch43_20.lha)

include:devices/scsidisk.h
scsiCmd

SmartFileSystem_SCSIdirect, FastFileSystem V44.5 und ProfiFileSystem-2_SCSIdirect use this command instead of the old trackdisk read/write commands.
=> No problems with harddisks bigger than 4 GigaBytes anymore. See

How to use 4 GigaByte harddisks
.

Not all scsiCMD are used, because I don' have a documentation.

(SCSIProgrammer (http://de.aminet.net/pub/aminet/dev/misc/ ↩
SCSIProgrammer.lha))
((include:scsi/commands.h SCSI-2 include files))

(Direct Access devices =da)
(Write Once devices =wo)
(CD-ROM devices =cd)
(Scanner devices =sc)
(Optical memory devices =om)
(Sequential access devices =sa)

```
        ( Printer devices              =prt)
        ( Processor devices            =cpu)
        scsiREAD6         =$08 ( da wo cd    om )(not tested)
        scsiREAD10        =$28 ( da wo cd sc om )
        scsiREAD12        =$A8 (    wo cd    om )(not tested)

        scsiWRITE6        =$0A (    wo       om )(not tested)
        scsiWRITE10       =$2A (    wo       om )
        scsiWRITE12       =$AA (    wo       om )(not tested)

    Has anyone a documentation for these commands?:
        scsiREAD_BUFFER   =$3C ( da wo cd sc om sa prt cpu )
        scsiWRITE_BUFFER  =$3B (    wo cd sc om sa prt cpu )
        scsiUPDATE_BLOCK  =$3D (             om            )



          Programmers
           What programmers should observe...

          Default
           Which values are the defaults?

          ReturnNumbers
           What are the return values?

          FileSystem installation
           How to use 4 GigaByte harddisks

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           What you should know when using ProfiFileSystem-2 and  ↩
              SmartFileSystem

          SCSIdevice installation
           Better use of ATA[PI] drives
```

1.33 FDA/Programmers

```
What programmers should observe...
==================================

  1. Data, which shall be written using the DOS functions Read/Write, should be
     LongWordAlligned (adr MOD 4=0), because the processor can access them
     faster then. This also applies to data which is sent directly to a device.
     AllocMem, Allocate... automatically return an address that is
     LongWordAlligned.  So you only have to pay attention if you divide a
     memory block manually.

  2. Remember: If you use SendIO instead of DoIO, the command is executed
     Async. Not only reading and writing, but also changeState, motor,
     protStatus, remove, changeNum ... commands.
```

1.34 FDA/Default

```
Which values are the defaults?
==============================

At the first start and after choosing <Edit/reset to Defaults> from the menu,
these values will be used:

     Create Icons                                        = FALSE (OFF)

     Not used FastMemory                                 = 60 KB
     Not used ChipMemory                                 = 50 KB
     FastMemFirst                                        = TRUE  (ON)
     View color flash if track moved or deleted          = FALSE (OFF)
     Protect tracks in memory with checksummes           = FALSE (OFF)


     HD             Async delay                          = 4 seconds
     Disk           Async delay                          = 7 seconds

     Device| Pri | Settings
     ------------------------------------------------------------------------
     DF0   | 100 | Removeable Disk, Write Async, Verify write
     DF1   | 100 | Removeable Disk, Write Async, Verify write
     DF2   | 100 | Removeable Disk, Write Async, Verify write
     DF3   | 100 | Removeable Disk, Write Async, Verify write
     DS0   |  80 | Removeable Disk, Write Async, Verify write
     DS1   |  80 | Removeable Disk, Write Async, Verify write
     DS2   |  80 | Removeable Disk, Write Async, Verify write
     DS3   |  80 | Removeable Disk, Write Async, Verify write
     PC0   |  60 | Removeable Disk, Write Async, Verify write
     PC1   |  60 | Removeable Disk, Write Async, Verify write
     PC2   |  60 | Removeable Disk, Write Async, Verify write
     PC3   |  60 | Removeable Disk, Write Async, Verify write
     PS0   |  40 | Removeable Disk, Write Async, Verify write
     PS1   |  40 | Removeable Disk, Write Async, Verify write
     PS2   |  40 | Removeable Disk, Write Async, Verify write
     PS3   |  40 | Removeable Disk, Write Async, Verify write
     CD0   |  20 | Removeable Disk, WriteRetention
     HD0   |   0 | Write Async
     HD1   |   0 | Write Async
     HD2   |   0 | Write Async
     HD3   |   0 | Write Async
     DH0   |   0 | Write Async
     DH1   |   0 | Write Async
     DH2   |   0 | Write Async
     DH3   |   0 | Write Async
```

1.35 FDA/ReturnNumbers

```
Return values
=============
```

```
The return values can be used within a shell-script.

     Sys:Prefs/FDAPref ENVARC:FDA-AfterBoot.prefs USE
     IF WARN ;FDA is not running
             RUN Sys:System/FDA ENVARC:FDA-AfterBoot.prefs QUIET
     ENDIF

     Sys:System/FDAView >NIL: Kill-FDA
     IF NOT WARN ;FDA is running before
             RUN Sys:System/FDA ENVARC:FDA-AfterBoot.prefs QUIET
     ENDIF

     RUN Sys:System/FDA ENVARC:FDA-AfterBoot.prefs QUIET
     IF $RC GE 5 ;FDA is running before
             Sys:Prefs/FDAPref ENVARC:FDA-AfterBoot.prefs USE
     ENDIF

     AlreadyRunning          = warn          (5)
     PreferenceCancel        = error         (10)
     PreferenceFDAnotRunning = warn          (5)
     NoDeviceCached          = fail+1        (20 +1)
     CanNotCreatePort        = fail+2
     ReadArgsError           = fail+3
     CanNotReadPrefs         = fail+4
     CanNotCreateTask        = fail+5
     AllocSignalError        = fail+6
     NoMem                   = fail+777-fail
```

1.36 FDA/Index

```
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*****


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Time
  Default

Tnt <1>
  DebugFiles

Tnt
  New Bug

Top (button)
  View

Tower with Zorro II Databoard (Micronik)
  Tested Systems

Track <1>
  InfoWindow

Track
  View

TrackDisk64 <1>
  Technical

TrackDisk64
  History

Umemployed
  Registration

UNI\\02
  Features

Unit number <1>
  View

Unit number
  InfoWindow

UPDATE Cache (Argument)
  View

update command
  DeviceWindow

URL
  Author
```