Savage_english

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COLLABORATORS

	TITLE : Savage_english	

ACTION	*NAME*	*DATE*	*SIGNATURE*
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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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Savage_english

1.1 Savage Main Menu

```
                        Savage-videodriver for 030/MMU AGA/ECS/OCS  ↩
                           Amigas

                    For ShapeShifter Macintosh Emulator

                         Version 1.3 (Registered)

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```

Please read the Savage030demo.readme first!

1.2 Required hard&software...

Requires:

Kickstart 3.0+ (for the 4bit modes too!!)

an AGA Amiga for the 256 & 15 bit modes (A1200/A4000)

OCS/ECS for 16 color & 8bit->4bit versions (A500/+/A600,A2000,A2500,A3000, ofcourse AGA
is good too!)

Softkicked A3000's: if this driver not work, please try the "PatchA3000MMU" tool,
which is part of the FastECS1.2 (available on aminet misc/emu directory), after use the
MMUoff program (which is in the A3000 directory), and after try to use this driver . If
the driver doesn't work after the patch too, please report it!

A turbo/processorcard/processor which contains a full 68030 (NOT EC030!!)
(Standard A4000/30 not...)
examples:Blizzard A1230/50Mhz card or A4030/50 processorcard
ex-GVP cards (50 Mhz CPU)
And the M-Tec cards which contains full 68030

It will not work on 68040/60! (Savage040-060 ofcourse yes, demo version is on the AmiNET)

ShapShifter3.2 or newer... (Tested only under 3.5)

MUCH Fast memory...

1.3 What's diz?

Sadly the ShapeShifter doesn't support the MMU of the 030-boards, to speed up the screen refresh. So all of full 030 users need to use other drivers, which try to reach the faster speed without MMU (examples: AGA-EVD,Agabooster)

But these drivers slow down the emulations, when none in the gfx changed (because the delta buffer check..) , especially in smaller refresh rates (1 or 2)

So i write this driver to fix these problem, because with the help of MMU only these lines need to be freshen, which changed since the last refresh. Because this is detected by hardware-way, you able to try ShapeShifter with refresh rate 1 ! (without big slowdown!!)

Note:Because this version now contains delta-buffer you able to use on a 68030/50 a 256 color version at refresh rate 1 without big slowdown, when the maximal change area of the screen is around 320x200/frame!

1.4 Technical description of the MMU

Lets start with the name:
MMU = Memory Management Unit

As you can see its mission to do some things with the memory handling.
(example: write protection, cache inhibit, showing the memory changes, others)

But the AmigaOS (yet) doesn't support the memory handling wit MMU, so the MMU is doesn't need to be in an Amiga.

Only some applications use it, where its really need: enforcer, VMM, cpu fastrom option, all UNIX and the LINUX, because almost unable to emulate it via software. (i can say UNABLE to emulate it via software way)

As you can see the MMU is a memory handling unit, so unable to do other thing to do (example:chunky->planar conversion) Because many people think it from the option of the ShapeShifter called "MMU refresh", how the MMU make the refresh, but its DON'T TRUE!

The MMU only able to handle the memory with (small) pages. (example: the 68851 in the 68030 is able to work with: 256byte, 512byte, 1k, 2k, 4k, 8k, 16k, 32k big pages)

```
And when we divide the Macintosh video memory to exam: 1kb size pages, the mmu is ↩
    able
to show how there was a difference in this page, and if yes, then we need only ↩
    convert
this chunk.

Ok that's all about MMU. If you interested by other technical information about ↩
    this
driver then take a look to
                Technical description
                !
```

1.5 The technical description of the Driver (only for experts .... :)

```
                As i said it at the
                MMU
                 part, this driver does not other, only convert
the changed parts of the display (which displayed by the MMU) from chunky to ↩
    simple
Amiga planar mode.

This driver uses 256kb root page table, and one, two or three (depends from the ↩
    mac
videomemory ) pages and an other buffer for the remap8k.
(That was the technical parameters of the MMU)
(This driver uses similar MMU configuration, like in the FastECS 1.2 I haven
the idea from that driver to write a 256 color driver..)

The function remap8k is not other, than the driver remaps the lower 8k of the ↩
    memory to
the fastram, for higher performance. (similar function is in the ShapeShifter for
040/060) This function gives on Amiga almost nothing difference, but the emulated ↩
    mac's
math performance raises around 20-30% , and only cost 16kb of memory on the Amiga ↩
    side.
All Savage driver uses the remap8k function.

The chunky->planar algorithm is a one pass cpu only algorithm, which can slow down ↩
     the
CPU when many pixels changes. This will be limited in the next versions.
(Similar routine is in the AGA-EVD 1.2 i think... :)

This version now uses delta-buffer, so the speed up (compared with 1.0) is around
50-400%! (but requires more memory... )
```

1.6 Configuring the drivers under ShapeShifter

```
                Simply  copy  the  drivers to the directory called "Video Drivers ↩
                   ", because that is the
```

default searching path of the external video drivers.

1x1 drivers:
From version 1.3 not limited the resolution of the 1x1 4bit & 8bit drivers, and the
8bit->4bit driver.

The 8bit driver is usable, when the MACINTOSH display memory requirement is smaller
than 512kb. The memory requirement of the display is easy to calculate: simply
multiple the display width with the display height.

Example:
640x480=307200, which is smaller than 524288, so usable.

The 4bit driver is usable, when the MACINTOSH display memory is smaller than 256kb,
which is equal in resolutions with the 8 bit driver, because similar 4bit resolution
needs half of the memory as in the 8bit mode. (i think this is logical..)
The memory requirements of the 4bit mode can calculate at the followings: multiply the
display widht with the display height, after divide it by 2.

Example:
640x480/2=153600, which is smaller than 262144, so usable.

!IMPORTANT!:
Thats, how the resoultion is able free to set, not means, how you can use any * stupid*
resolution, and it will works! I maked this option because many people asked for it.
(i dont able to make guarantee using not recommented resolutions, because its a MAC
side problem, not the driver's problem!)

Recommented and legal MAC resolutions are the nexts: (whichs usable)
512x384
640x480
832x624 (Because i dont know, how the MAC's support the 800x600 mode, because a
PowerMAC 7100 is support only this resolution)

I want two things to say:
-If select a display mode (which is not in the upper list) please make sure how the
width dividable with 64. (thats not require for the driver, only need for the MAC
programs)

-Make sure, how the display memory is dividable with 1024. (all the upper resolutions
are so) Because the driver cut the convertable memory to 1024 dividable parts, and when
its not dividable with 1024, then possible how some pixels/lines will be not converted.

15Bit driver:

Here is only resolution 640x480 and ofcourse you must select 15bit colors.
(That's will be converted to ham8)

8bit->4bit driver:

This is new from 1.3.
Using this driver you able to run 256 color/gray applications on OCS/ECS machines 16
grayscale (you able to play with wolf 3d ;). (you must set 256 colors to the color
number)
(a fast conversion routine convert the 256 color/gray graphics to 16 grayscale)
The driver able to convert both color/gray graphics, all will be convert to 16 grays.
(its not important the how the Control Panels/Screen color or gray is to set, but some
programs (example:wolf3d) need to be set color to run)
The drivers memory requirement is similar as the simple 8 bit mode.

2x2 driver:
Savage2x2_640x480_8bit here the resolution is only 320x240 (similar like in Xanth-driver)

Memory requirements:
The first turn off the largest free block option, and set by manual the memory size.
The driver's memory requirements:
(the 8bit and 4bit modes are examples)

Savage8bit (640x480)	856 kb	(640x480 = 300kb+256kb MMU page fix+300kb dbuff)
Savage8bit->4bit(640x480)	856 kb	(640x480 = 300kb+256k+300kb)
Savage4bit (640x480)	556 kb	(640x480 = 150kb+256kb+150kb)
Savage2x2_640x480_8bit	886 kb	(1024x480 = 480kb+256kb+150kb)
Savage_640x480_15bit	1488 kb	(640x480 = 600kb+256kb+600kb+32kb ham8convtab)
Savage8bit (512x384)	640 kb	(512x384 = 192kb+256kb+192kb)
Savage4bit (512x384)	448 kb	(640x480 = 300kb+256kb+300kb)

Sadly (you can see it ...) for the easier handling the MMU page all driver's need 256kb
more memory than other ways....

I think you discovered it, how the 2x2 mode in the resolution 640x480 need more memory,
but it have a simply answer. For the higher speed every line need to be 1kb. (because
the pagesize of the mmu is 1kb too)

So simply sub these values from the maximal memory and write it to the mac memory. (if

```
the mac videoram, or other puffer located in the chip memory the driver will be ↩
   opens a
requester and quit.  So sub a little bit more if you want sure to start it!)

But  these  values  are  the  most bigger values, and its able to start them at ↩
   smaller
memory.  (around 100-200kb smaller)

At last the
                setting the refresh
                 is coming.
```

1.7 Setting

```
Because this driver uses MMU, you should first try it with refresh rate 1.
(At the 15bit mode too!!)
This are recommended when changes an area of size around 320x256/frame, and  ↩
   requires
much CPU power at same time:little screen games, emulators (Hi Louise!), image
manipulators.  Or simply requires much CPU power:  like ray-tracers, DTP programs.

But when you can use so program what makes many screen manipulation (ex:games)  ↩
   then you
should try refresh 2 or 3 , or better try the 2x2 versions of the driver, and you  ↩
   can
reach a good CPU/Graphics speed.

Note: All values is for a 50Mhz 68030 at 256 color mode!
```

1.8 Test results-8bit

```
Test machine: A1200-68030/50 Mhz 2meg Chip+4meg Fast No FPU
Software:Mac System7.1 (Hungarian) 40 meg hd - ShapeShifter 3.5
(macintosh rom was everywhere in the fast memory - so the faster speed was  ↩
   everywhere)

I make the tests with Speedometer 4.0.
The resolution is everywhere 640x480 256 colors.  (except the Amiga 1 bit, that i
include it for comparison)
(The Amiga1bit and the Amiga8bit is the internal drivers of the ShapeShifter 3.5 , ↩
    all
other is external driver)

1.0=Mac Quadra 605 (68040/25Mhz)

Driver:          Savage  SavageSavage2x2  Xanth Amiga8bit Aga-Evd AGAboost  ↩
   Amiga1bit
Version:            1.3     1.3      1.3     1.0      3.5     1.2      0.9        ↩
   3.5
Refresh rate:         1       2        2  intern        4       3        2  ↩
          -
```

```
------------------------------------------------------------------------------- ↩

CPU:              0.777   0.789    0.791   0.603    0.296   0.528    0.621      ↩
    0.801
MATH:             1.924   1.956    1.961   1.319    0.619   1.085    1.371      ↩
    1.789
Benchmark Aver:   0.677   0.681    0.687   0.524    0.257   0.445    0.558      ↩
    0.699
Color Quickdraw:  0.346   0.411    0.556   0.451    0.279   0.392    0.387      ↩
    0.608

Note: the Xanth driver uses internal refresh (i think..) what is around 2.

As you can see this driver offers you the higher CPU/MATH speed, and the color
quickdraw value is high too (especially when you look, how its made with refresh  ↩
    rate
1...)

The driver 2x2 is recommended for games, with higher color quickdraw speed and
excellent CPU performance.  (and the c2p routine is nicer than in the Xanth...)


Here is some other test results with a program called: BenchmarkV1.0B3
(i write only the important test results, and here is all values in seconds,  ↩
    smaller
values are higher performances)


Driver:          Savage  Savage Savage2x2  Xanth Amiga8bit Aga-Evd AGAboost  ↩
    Amiga1bit
Version:            1.3     1.3       1.3     1.0       3.5     1.2      0.9  ↩
         3.5
Refresh rate:         1       2         2  intern         4       3        2  ↩
          -
------------------------------------------------------------------------------- ↩

Moire:              8.42   7.30      6.43    7.12      7.95    8.08     6.82       ↩
    5.22
Butterfly:         13.10  12.10     11.03   13.47     18.57   18.45    15.18      ↩
    10.70
Ripples:           80.87  80.50     76.63  113.70    144.60  140.60   111.63      ↩
    81.80

Sadly i was unable to test it with games, because i have only 4 meg fastmem...   ↩
    :(((
```

1.9 Test results-4bit

```
Test machine: A1200-68030/50 Mhz 2meg Chip+4meg Fast No FPU
Software:Mac System7.1 (Hungarian) 40 meg hd - ShapeShifter 3.5
(macintosh rom was everywhere in the fast memory - so the faster speed was  ↩
    everywhere)

I make the tests with Speedometer 4.0.
The resolution is everywhere 640x480 16 colors.  (except the Amiga 1 bit, that i
```

include it for comparison)
(The Amiga1bit and the Amiga4bit is the internal drivers of the ShapeShifter 3.5 , all
other is external driver)

1.0=Mac Quadra 605 (68040/25Mhz)

Driver:	Savage	Aga-Evd	FastECS	Amiga1bit	Amiga4bit
Version:	1.3	1.2	1.2	3.5	3.5
Refresh Rate:	1	2	intern	-	3
CPU:	0.787	0.559	0.795	0.801	0.614
MATH:	1.934	1.256	1.928	1.789	1.372
Benchmark Aver:	0.687	0.485	0.695	0.699	0.531
Color Quickdraw:	0.492	0.475	0.262	0.608	0.500

Comment: the FastECS driver uses internal refresh which is around 1.

As you can see this driver offers you the higher CPU/MATH speed, and the color
quickdraw value is high too (especially when you look, how its made with refresh rate
1...), and this driver is around 2 times faster than FastECS.
(this driver in 256 color mode is around 30% faster than FastECS in 16 colors... !!)

Here is some other test results with a program called: BenchmarkV1.0B3
(i write only the important test results, and here is all values in seconds, smaller
values are higher performances)

Driver:	Savage	Aga-Evd	FastECS	Amiga1bit	Amiga4bit
Version:	1.3	1.2	1.2	3.5	3.5
Refresh rate:	1	2	intern	-	3
Moire:	6.53	6.95	7.45	5.22	6.48
Butterfly:	11.17	15.52	11.62	10.70	14.37
Ripples:	78.72	120.98	78.65	81.80	110.00

1.10 Testresults-15bit

Sadly (because i have only 4 megs of Fastram..) i was not able to start SpeedoMeter,
(when the Macintosh rom located in the fast memory...) and here is no testresults :(((.

Note: but looks like, how this driver with refresh rate 1 is very usable, and MUCH
faster than AGA-EVD. (If you don't think it so, then try AGA-EVD with refresh rate 1...
;)

1.11 About the author

```
                If you have any problems, suggestion, bug reports then write to:

snail mail:             László Török (pH03N1x/CDi)
                        H-8900 Zalaegerszeg
                        Cserfa 31.
                        Hungary
phone:                  +36 92 310 396 (after 18:00 CET)

E-Mail : phoenix@master.fok.hu
or:      phoenix@fok.hu         (i think equal with the previous..)
or:      torokl@alpha.dfmk.hu   <- work

I think now i have an account on the
                Dark Millennium BBS
                 So you can
reach me under user name:  phoenix (Thanks Dark!)

iRC (not so often..) : pH03N1x@iRC (#magyar, #amiga vagy #amigahu channels)

U can check my homepage at (a bit old): http://www.fok.hu/~phoenix
(out of order, becoz the home volume fucked up..)

As u can see my english knowledge is very limited, and my german is MUCH better...
(ich denke so... ;)
```

1.12 The support sites

```
You able to find the new demo versions of this driver on the following sites:
Aminet: misc/emu subdirectory

and

Dark Millennium BBS:        (CDi WHQ/Crimson Jihad Distro)

phone: +36 93 320 679

HW: A1200-68060/60 18 meg ram 1.3GHD 4xCD-ROM 28.8k
open: every day 22.00-06.00 (CET)

Sysop: Dark/CDi
```

1.13 Revision history

```
0.9b (10.06.1996)       First working version .... (yeeeepp :)
                        Size-optimization... (its good for now a 4kb intro.. :)
                        Including Remap8k

1.0  (11.06.1996)       Including BorderBlank function
                        1x2 and 2x2 and 512x384 versions
```

```
                        Some memory frees bug fixed

1.1  (17.06.1996)       Delta-Check buffer added (50-400% speed increase!)
                        4 bit version added (around two times faster than FastECS ↩
                           1.2)
                        15 bit version added (very fast at refresh rate 1!)
                        Stop supporting 1x2 versions (there was not a big speed
                        difference compared with the 2x2 versions)

1.11 (19.06.1996)       Heavy code optimization->10% faster drivers
                        Fixed some memory freeing & MMU turnoffing problems
                        Some little bugfix in the 4bit drivers

1.12 (22.06.1996)       MUCH heavier code optimization->again 10% speed up
                        (only in the 4bits, and the simply 8 bit drivers)

--------------FREEWARE conception changed to SHAREWARE  ↩
    ---------------------------------

1.2  (28.08.1996)       Screen memory allocation is MUCH safer.
                        All important memory address is now 32bit address:+5%speed ↩
                            up
                        New version string handling (very important ;)
                        (i think higher speed is not possible whitout changing the ↩
                            c2p
                        routine)


1.3  (22.09.1996)       1x1 4/8 bit modes able free to select the resoulution
                        New 8bit->4bitgray driver
                        Some optimization in the init routines
```

1.14 To do list:

```
The MMU is limited to 2GB.. i hope this area contains the M-Tec and the GVP cards  ↩
    ram
address range.                                  (if not so sorry... i have Blizzard  ↩
    :)

The c2p routine will be changed a CPU+Blitter routine.  (CPU+Blitter rules...  we  ↩
    are
on Amiga -not?  ;)

Fast 15bit->256 colors (332 dither) and 15bit->256 gray conversion

16 colors Workbench-window version (only on AGA)
```

1.15 Used hard & software

```
Hardware:

A1200-68030/50 (BlizzardIII) 2meg Chip + 4 meg Fast
```

```
Samsung 120 meg HDD (from it around 20megs bad block :((((( and the reading speed ↩
   is
300kb/s on 68030/50... and random crashes... :(((  (some contact errors..) don't ↩
   can
give somebody a usable (little is good too!) HDD? ...)

Ehh... now i have a "usable" HDD... 170 MB Quantum rulez

1084s monitor.... (its important... :)

2x80watt audio.... (its MUCH important... :)

Technics RS-TR 333 Deck

Sony  MDR  CD250  Headphone  (to keep the family peace...  i think dont need to ↩
   use the
2x80 at the night...  or ?  ;)


Software:

Shapeshifter-ExeternalVideodriver manual level2 by Christian Bauer
                        (A very good & usable manual & driverspecification ↩
                           description)

Asm-one 1.29 ..         This version is able to compile MMU code... but still have ↩
    bugs
                        so dc.l $f0114000 rulez again...

MMU Expert 1.32         by F.Bürgel... (oldie but goldie! (from 1991))

HippoPlayer 2.30        need some zax for developing...

D68k 2.0.7              The best resourcer on Amiga (i think better than resource ↩
   6.0)
                        (FULL MMU,FPU,68000-68060 support!)

This file checked with the MacWrite Spelling checker... (From Shape...)

44 Guru (reported by MCP gurureport) (from MMU config error to corrupt memory list ↩
    in
freememen and some illegal instruction so Amiga rulez... ;)
```

1.16 The author wishes to thanks:

```
The author wishes to thanks:

Christian Bauer                 For the World's best Macintosh emulator, and the
                                awesome external videodriver concept

K-P Koljonen                    for Hippoplayer
```

```
Psycho@master.fok.hu            for the account,and for the free HDD(almost  ↩
   unusable ;)

Pawel Hernik                    for AGA-EVD, and for the c2p routine (and 4bit c2p ↩
    too)
                                and for the 15bit->ham8 conversion routines (this  ↩
                                   is a
                                very fast&good routine!)

Peter McGavin                   for the fastest c2p routines on Amiga

Chris Brenner                   for FastECS  (which uses similar MMU config like  ↩
   this
                                driver) , and for the idea of remap8k

Michael 'Xanth' Spenner         for the 2x2 version idea

Dennis Arketyd                  for the Agaboost driver

To all registered users!

Other greetinx:

Amiga:  Dark/CDi, Shamen/CDi, Flex/Frame18, Anorganic/Promise, Pogi/Crimson Jihad
        Hanzi/???, Chexum

        Louise/??????      -       A ShapeShifter maniac... ;) (like me...)
        All members of Amiga Only       <- The best Hungarian amiga-user mag

PC:     Basq/Tsi Alive, Trajic/Shock!, Hamster/???, Dada

Thanks for the ql music (tg96 4 channel compo...) which i heard very often during
developing..

mod.After Eight
mod.AlleSammen
mod.ba'rock
mod.big'n funky         <- this is my favorite...
mod.dawn of a new man   <- this too...
mod.keys to imagination <- and this too...
mod.river volga

And a BIIIIGG greets to all sid composer. (i have a BIIIGG sid collection)

And the following composers:
Jogeir Liljedahl
Scorpik
XTD

Last, but not at least: the Developers of the Amiga and AmigaOS (yes this is a  ↩
   really
OS -okay, have some bugs- , but really fun to develop under it!!)

Fuck to all PC-owners who's think how Amiga is a game-machine...
```

1.17 Legal mush

```
This  driver  is  SHAREWARE, but only the registered users have a permission to  ↩
    use it,
and dont able to give it to other peoples.  Use it at your own risk. (the old  ↩
    driver
was FREEWARE, but becoz i get 0 (yes 0!!!) donation from the users i changed it to
SHAREWARE... )

Amiga  and  the  AmigOS  is  registered  trademark of ESCOM or Viscorp (i don't  ↩
    know it
exactly...  it changes to often..)

Macintosh is registered trademark of Apple computer INC.
```