

# **MuProtectModules**

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<b>COLLABORATORS</b>
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# Chapter 1

## MuProtectModules

### 1.1 MuProtectModules Guide

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MuProtectModules Guide

Guide Version 1.02 MuProtectModules Version 40.2

NOTE: This release of MuProtectModules requires LoadModule 40.5 or better. Older releases are no longer supported.

[The Licence : Legal restrictions](#)

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Thomas Richter

### 1.3 What's the MMU.library?

All "modern" Amiga computers come with a special hardware component called the "MMU" for short, "Memory Management Unit". The MMU is a very powerful piece of hardware that can be seen as a translator between the CPU that carries out the actual calculation, and the surrounding hardware: Memory and IO devices. Each external access of the CPU is filtered by the MMU, checked whether the memory region is available, write protected, can be hold in the CPU internal cache and more. The MMU can be told to translate the addresses as seen from the CPU to different addresses, hence it can be used to "re-map" parts of the memory without actually touching the memory itself.

A series of programs is available that make use of the MMU: First of all, it's needed by the operating system to tell the CPU not to hold "chip memory", used by the Amiga custom chips, in its cache; second, several tools re-map the Kickstart ROM to faster 32Bit RAM by using the MMU to translate the ROM addresses - as seen from the CPU - to the RAM addresses where the image of the ROM is kept. Third, a number of debugging tools make use of it to detect accesses to physically unavailable memory regions, and hence to find bugs in programs; amongst them is the "Enforcer" by Michael Sinz. Fourth, the MMU can be used to create the illusion of "almost infinite memory", with so-called "virtual memory systems". Last but not least, a number of miscellaneous applications have been found for the MMU as well, for example for display drivers of emulators.

Unfortunately, the Amiga Os does not provide ANY interface to the MMU, everything boils down to hardware hacking and every program hacks the MMU table as it wishes. Needless to say this prevents program A from working nicely together with program B, Enforcer with FastROM or VMM, and other combinations have been impossible up to now.

THIS HAS TO CHANGE! There has to be a documented interface to the MMU that makes accesses transparent, easy and compatible. This is the goal of the "mmu.library". In one word, COMPATIBILITY.

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Unfortunately, old programs won't use this library automatically, so things have to be rewritten. The "MuTools" are a collection of programs that take over the job of older applications that hit the hardware directly. The result are programs that operate hardware independent, without any CPU or MMU specific parts, no matter what kind of MMU is available, and programs that nicely co-exist with each other.

I hope other program authors choose to make use of the library in the future and provide powerful tools without the compatibility headache. The MuTools are just a tiny start, more has to follow.

## 1.4 What's the job of MuProtectModules?

MuProtectModules write-protects modules loaded by the "LoadModules" program of the same author. This would allow, for example, to load some AmigaOs 3.5 or 3.9 extensions as the new workbench.library or the new icon.library into the RAM and then protect them from getting overwritten as if they would be part of a real ROM. Hence, MuProtectModules gives the word "AmigaOs ROM Updates" a new sense.

MuProtectModules does its job by telling the MMU not to allow write accesses to the memory area where these modules are kept, and hence simulates a real "ROM". The advantage is that they cannot be overwritten by faulty programs and hence remain untouched.

## 1.5 Installation of MuProtectModules

First, make sure you load extended modules by the "LoadModule" program in the startup-sequence. MuProtectModules will not be able to protect any other kind of libraries or devices except modules installed by means of this program. Please read the instructions of "LoadModule" how this is performed.

NOTE: This release of MuProtectModules requires LoadModule 40.5 or better. Older releases are no longer supported.

Then, make sure the "mmu.libray" is installed. Copy this library to your LIBS: drawer if you haven't installed it yet. It is contained in this archive.

Copy "MuProtectModules" wherever you want.

Run it in the startup-sequence or in the WBStartup drawer.

## 1.6 Command line options and tooltypes

MuProtectModules can be started either from the workbench or from the shell. In the first case, it reads its arguments from the "tooltypes" of its icon; you may alter these settings by selecting the "MuProtectModules" icon and choosing "Information..." from the workbench "Icon" menu. In the second case, the arguments are taken from the command line. No matter how the program is run, the arguments are identically.

MuProtectModules ON/S,OFF/S

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ON/S

Enables the MuProtectModules function. This is also the default option.

MuProtectModules will automatically detect a running MuForce process and will then use "aggressive" protection instead of defensive protection. This means that a "hit" will be thrown as soon as a write access onto the ROM modules is attempted. Otherwise, the write access will be denied silently.

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OFF/S

Disables MuProtectModules and therefore allows write access onto the ROM modules.

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When started from the workbench, MuProtectModules knows one additional tooltype, namely:

WINDOW=<path>

where <path> is a file name path where the program should print its output. This should be a console window specification, i.e. something like

CON:0/0/640/100/MuProtectModules/AUTO/CLOSE/WAIT

This argument defaults to NIL:, i.e. all output will be thrown away.

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## 1.7 History

Release 40.1:

This is the first official release.

Release 40.2:

Updated MuProtectModules to support LoadModules 40.5.

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