# MacIIUsers

| | **COLLABORATORS** | | |
|---|---|---|---|
| | *TITLE* : <br><br> MacIIUsers | | |
| *ACTION* | *NAME* | *DATE* | *SIGNATURE* |
| WRITTEN BY | | December 2, 2024 | |

| | **REVISION HISTORY** | | |
|---|---|---|---|
| NUMBER | DATE | DESCRIPTION | NAME |
| | | | |

# Contents

# Chapter 1

# MacIIUsers

## 1.1  EMPLANT - Macintosh Emulation User's Guide

```
            EMPLANT – Macintosh Emulation User's Guide
             Copyright ©1992, 1993, 1994 By Jim Drew
            & Utilities Unlimited International, Inc.
                      All Rights Reserved

           EMPLANT Created By Jim Drew & Joe Fenton

           AmigaGuide/MultiView/ANSI Documentation:
                         Mike Fenton
```

```
 Important Information   Read this first!
 Introduction      Getting installed...
 Emulation Overview

 Launching the Emulation
 Emulation Setup   Everything you need to set first...
 Starting up the Emulator
 Emulation Control Window  More control than a real Mac...

 EMPLANT Utilities

 Compatibility
 Video Driver Notes    3rd party boards...
 Trouble Shooting

 Glossary      Confused?  Look no further!
 Illustrations
 Copyright and Trademark Acknowledgements
```

## 1.2  Legalities & Warranty Information

```
            Legalities & Warranty Information

               Use of Licensed Software:
```

By using this product, you acknowledge that the emulation module may
require the use of software which may be the property of others, including,
but not limited to, Apple Computer, Inc.  The use of this emulation module
will require you to obtain the right to use such software from Apple
Computer, Inc. and/or other authorized parties.  Failure on part of the
user to lawfully obtain the right to use licensed software may be a
violation of law, including the copyright laws.  Jim Drew and/or Utilities
Unlimited Intl., Inc. makes no representations concerning the availability
or cost of obtaining such rights.

Disclaimer:

Although Jim Drew and/or Utilities Unlimited Intl., Inc. believes this
software performs the functions described in this user manual, the software
is provided "as is" without warranties on performance, either expressed or
implied, including, but not limited to, the implied warranties of
merchantability and/or suitability for any purpose.  The user assumes all
risks.

Jim Drew and/or Utilities Unlimited Intl., Inc. cannot be held liable for
any damages from misuse, installation, or operation of the EMPLANT
hardware, and/or emulation modules.  Jim Drew and/or Utilities Unlimited
Intl., Inc. do not guarantee that this emulation module is 100% compatible,
either in program functionality and/or emulation speed.

Product Warranty:

The EMPLANT hardware is covered by lifetime warranty against defects in
workmanship, parts, and labor.  Made in the United States of America (a
fact we are proud of!)

## 1.3  Introduction

Introduction

Please read this manual in its entirety before attempting to install or use
the emulation module!

Please check the disk for last-minute information and changes.  Where a
conflict appears between this manual and any "readme" or "change.txt"
files, follow these files!  The "EMPLANT.history" file will contain all of
"changes.txt" files since the beginning of the emulation.  Please read this
file in its entirety.

    Software Backup
    Emulation Requirements  The 7 things you need...
    Software Installation 6-step guide to Mac installion...
    Obtaining a ROM Image

Discussion

This emulation module concerns itself with the Mac II support.  Where
differences exist between a real Mac II and EMPLANT's Mac II emulation,

they will be noted.  It is assumed that the user is familiar with the
Macintosh system and any applications the user wishes to use.  If you are
not familiar with the Macintosh's operating system, it is suggested that
you purchase "how to" books to learn.

The Macintosh computer has revolutionized the computer industry with its
strong points in user-friendliness and power-house software.  With programs
such as Adobe Photoshop, Adobe Illustrator, Aldus Freehand, Quark Express,
Fractal Painter, and countless others, it proves that even though the
Macintosh lacks the potential of the Amiga, it has some of the best
software for it ever written, making it almost a requirement in the
professional environment.

By now, Commodore must realize that these power-house applications will not
be "ported" to the Amiga platform.  So, "if you can't port 'em, run 'em"...
and an emulation system was born.


## 1.4  Emulation Requirements

                          Emulation Requirements

To use the Macintosh emulation module, you must have:

1)  Apple 256K Mac II/IIx/IIcx/SE-30 ROMs.  There were three different
    revisions of these ROMs (v1.1-v1.3).  If you can find v1.1 or v1.2
    ROMs, the price will be substantially lower than the v1.3 ROMs.

    (The v1.1 and v1.2 ROMs did not support high density floppy drives,
    and, for the most part, were of no real value to real Mac owners.
    In fact, we found service centers actually throwing these ROMs in
    the trash because they are of so little value to Mac owners.)

    Even though high density drive support was not built into the
    earlier ROMs, Mac emulation module still supports high density
    drives (via "multi-os.device").

    The ROMs come as four twenty-eight pin chips, or as a ROM-SIMM
    board.  There are two known versions of the DIP packaged ROMs.  The
    older style can just be plugged into the EMPLANT hardware and dumped
    normally.  The newer style (512K ROMs with only 256K of code burned
    into them) require an adapter socket and special software to dump
    them.  These ROMs are easily identified by having "T1000" as part of
    the part number.  Please read the docs on the release concerning the
    dumping of these ROMs.  See also Dumping the ROMs.

2)  A Macintosh system disk.  This may be in EMPLANT, AMAX, Macintosh
    800K, or Macintosh high density format.  Macintosh 800K format
    requires SYBIL, or AMIA (AMIA uses a real 800K Mac disk drive); and
    Macintosh high density format requires any Commodore (or compatible)
    high density drive.

3)  A 68020/68030/68040 CPU.  Currently, this emulation module does not
    allow the use of a 68000/68010 as they are not supported by the
    Mac II ROMs.  Although an MMU is not required for the emulation
    module to run, video display speeds can be as much as ten times

faster when having an MMU.

4)  At least 2 Megabytes of FAST memory.  This is about the minimum
    useful memory for using this emulation module.  At least 4 Megabytes
    of memory is needed if System 7.0 (or higher) is used.  This memory
    should be 32 bits wide for best speed.

5)  A hard drive partition for the emulation module software to be
    stored on.  You will need about 1 meg of hard drive space for the
    current version of the software.  This requirement will get larger
    as we continue to develop this system and additional utility
    programs for it.

6)  A Mac partition or hard drive with at least 10 megs of space
    dedicated for the emulation.

7)  Commodore's v2.04 (Kickstart 37) or higher operating system.
    File loaded versions of Kickstarts are unusable.  (For example, you
    cannot use Rekick/LKick/ZKick to run under Kickstart 37+ while using
    the emulation.)

## 1.5  Software Backup

Making Backups

Before using the EMPLANT – Macintosh Emulation disk, please make a backup
and place the original in a safe place.  Note: You are authorized to make
backups for your own use.  The disk is unprotected and may be copied using
any Amiga backup utility.

Software upgrades, bug fixes, and drivers may be freely distributed as long
as they are not altered in any way.  Most of these programs will be of no
benefit to those without the EMPLANT hardware.

## 1.6  Software Installation

Software Installation

A brief overview of Mac II emulation installation:

  1.  Insert the "MACII" software disk into an Amiga disk drive.

  2.  Double-click on the disk's icon (this will open its window).

  3.  Double-click on the icon labeled "HardDisk_Installer."

     Now the Amiga's "Installer" program will load and its
     window will open.

  4.  Select "Proceed" button if you are ready, or "Help..." if
      you need more help first.

  5.  Follow all the instructions the installer gives you.

      The installer will ask you a question at the top of the
      window and provide a set of response buttons at the bottom
      of the window for you to select.

  6.  When the installer has completed its installation and you
      are ready to test the software, reboot the computer.

      To reboot the Amiga, remove the MACII disk if you have not
      already done so.  Then hold down the Ctrl, Left Amiga, and
      Right Amiga keys simultaneously.  Then release these keys.
      The computer should go through two cycles of increasingly
      bright grey colored screens.  Then Workbench will appear
      again.  If all went well, the emulator should be ready for
      you to setup.


                      Installation – Details

Each release disk and upgrade disk to the emulation software will contain
an installer script that uses Commodore's installer program.  The installer
program is included with each disk for those who do not already have it.

To install or update your software, simply open the Mac II emulation
software disk by double-clicking on its icon, while on the Workbench.
Once it is opened, you will see the file called "HardDisk_Installer".

Double-Click on this file, and follow the on-screen instructions.  You
might want to "practice" the installation procedure by selecting the
"Pretend" option when the installer first starts.

Using this option will go through all of the motions of a complete
installation, but it will not install any software, and will not modify any
of your existing programs.

If you do not care about what is happening while the installer is working,
you can switch from an "Expert" user (the default) to a "Novice" user.
With "Novice" selected the installer will only tell you about the progress
of the installation, and not ask you for any special path information you
may want to provide.

Part of the installation requires the addition of a single line in your
startup-sequence.  This single line must be the very first (not the
second, third, fourth, etc.) line in your startup-sequence.  If it isn't,
the emulation will not work.  This line should be:

execute >NIL: s:SetupEMPLANT

This line can be automatically added to your startup-sequence for you by
the installer program.  You will also need the file "SetupEMPLANT".  This
file can also be created for you by the installer program.

  Currently, this script file contains only one line in it (please
  remember to consult the "read.me" files on upgrade disks, as things
  will change):

```
RsrvMemII >NIL:
```

```
RsrvMemII has two switches:  -r and -s.  If the emulation works the
way this is already set, don't change it.
```

```
RsrvMemII >NIL: -r  This will force the program to work
with the GVP Combo boards.
```

```
RsrvMemII >NIL: -s  This will put aside up to two megs of
memory for normal Amiga startup programs without affecting the
amount of memory that can be allocated for the emulation to run in.
If you are using 32 bit mode, you should not use this option.
```

This script file is actually what performs the various functions
required to setup the EMPLANT hardware and software.  Once this
file's functions have been completed, the rest of the startup-
sequence will be allowed to continue.

Another part of the installation requires the addition of a single line in
your user-startup.  This single line must be the very last line in your
user-startup. This line should be:

execute >NIL: s:AssignEMPLANT

This line can be automatically added to your user-startup for you by the
installer program.  You will also need the file "AssignEMPLANT".  This file
will be created for you by the installer program.

Currently, this script file contains only one line in it (please
remember to consult the "read.me" files on upgrade disks, as things
will change):

Assign EMPLANT: <path to EMPLANT emulation software>

Example:  Assign EMPLANT: dh0:Emulators/EMPLANT

As you can see, the process of installing the line into your startup-
sequence and the creation of the "SetupEMPLANT" and "AssignEMPLANT" files
could be rather confusing to the novice Amiga user, and therefore, we
highly recommend that you let the installer program perform these actions
for you.

Once the emulation software has been installed, and the SetupEMPLANT &
AssignEMPLANT files created along with the addition of the line in your
startup-sequence & user-startup, you should be already to test it out.

Reboot your machine.  Your machine should go through a "double-reboot"
procedure.  This is indicated by the machine resetting twice (two cycles of
dark-grey, medium-grey, and white screens) and eventually get to the
Workbench.

If you make it this far, congratulations...your Amiga is now capable of
multitasking in the Supervisor mode (required for the Macintosh emulation
to multitask with the Amiga).

If your machine constantly reboots, then you probably have a memory that
does not "auto-config".  You should contact Utilities Unlimited, Inc. for

further assistance.  If your startup-sequence stops with an error message in
a CLI window, make sure that the "SetupEMPLANT" program is in your S:
directory, and that you also have the file "RsrvMemII" in your C:
directory (all of this should have been done if you used the installer
program).

## 1.7   Obtaining a ROM Image

Obtaining a ROM image

The Macintosh emulation requires that you have a ROM image from a SE-30,
Mac II, MacIIx, or MacIIcx computer.  These ROMs can be purchased from
various authorized Apple Service center, Macintosh repair centers (those
that are not officially recognized by Apple), and through private parties.

Please understand that you must legally own the ROMs you will be using for
the emulation.  We cannot stop you from using an illegally obtained ROM
image any more than a gun store owner can stop you from shooting someone
with a gun purchased at his/her store...

Please use some common sense here and understand that people make a living
writing software such as operating systems, and they deserve to make their
fair share for their efforts!

Because of the frequent changes in the programs used to dump the ROMs to a
disk file, please read the documentation provided on your release disk for
detailed information about the ROM dumping procedure.  Dumping the ROMs

Make sure that once you have created your ROM image, you copy it to your
"EMPLANT:ROM_Images" drawer.

## 1.8   overview

Overview

The following articles explain, in general, aspects of the emulation.  They
also mention a few things you may need to know about the Macintosh...

    Multitasking
    Mouse and Keyboard  Plus special keys...
    Floppy Disks
    Hard Drives
    Sound
    Video
    Real-Time Clock/Parameter Ram
    Clipboard Sharing
    Restarting and Quitting

## 1.9   Multitasking

Multitasking

This emulation does not take over the system; it allocates the memory
needed and launches a process to handle the emulation.

To switch between the emulator and the Amiga, see Emulation Control Window.

Currently, a special block of memory must be available for the Macintosh
emulation to use and is allocated using the RsrvMemII program.  This program
holds the memory through reboots, making it available for the emulator.  Any
other memory is dynamically allocated when the emulator is run.

The priority of the Macintosh emulation process may be set by the user, but
care must be taken.  Even though the emulation does multitask, the
Macintosh does not wait properly, but rather, it busy loops.  This means
that the process always runs when it gets the chance.  As a result, any
process at a lower priority than the Macintosh emulation will not be run.

If you set the In-Front priority of the emulation too high, you may prevent
things like shells, editors, or even DOS devices from running.  Keeping the
priority at zero gives the emulation approximately 50% of the CPU time.

The video refresh is handled by a separate process.  This process takes
care of the video conversion/refresh, and vertical blank interrupts.  The
priority for this process is automatically set to be one higher than the
emulation In-Front priority so that keyboard and mouse inputs are not lost.


## 1.10  Mouse and Keyboard


Mouse and Keyboard

The mouse and keyboard are handled as ADB devices.  The mouse is a standard
ADB mouse set for 200cpi (counts per inch).  The keyboard is an extended
ADB keyboard with the following qualifications:  (See MacKeyMap)

The left and right qualifiers (Shift/Alt/Amiga) all return the same codes.
A real extended keyboard can be programmed to tell the sides apart.

Function keys 11 to 15 are not yet implemented.
PageUp, PageDown, Home, and End are not yet implemented.

The Alt keys act as the Macintosh option keys.    (option = Alt)
The Amiga keys act as the Command (flower) keys.  (Command = Amiga)

Normally, pressing Left-Amiga-N brings the Workbench screen to the front,
but on the Mac, this creates a new folder if a drive or directory is
selected.  Left-Amiga-M toggles Amiga screens, but on the Mac, this does
whatever has been assigned to Command-M key combination.

To avoid serious problems, Left-Amiga-N and Left-Amiga-M are not passed to
the Macintosh emulation.  If you want to use Command-N or Command-M key
combinations, use Right-Amiga-N and Right-Amiga-M instead.

Special key combinations

Rebuild desktop:  hold option-Command while starting up  (Alt-Amiga)

    Keep this key-combination held down until you get a
    requester that asks if you want to rebuild the desktop.  As
    the Apple Reference manual states, you should rebuild your
    desktop regularly--once a month, or so.

    NOTE:  Rebuilding the desktop erases all the comments from
    your files.

Disable system extensions:  hold Shift key while starting up

    When you hold this key down while starting up, you should
    get a message which states that the extensions are disabled.
    The system then continues to start up, ignoring any
    extensions you have in the System Folder.

    This may be necessary if you keep getting "bombed."  Your
    software may not like one of the extensions you're using.

Forced Quit:  option-Command-esc  (Alt-Amiga-Esc)

    This will pop up a requester asking if you are sure you want
    to force the quitting of the currently running application.
    If you select Quit, the application will be forced to stop
    whatever it was doing and Finder will become active.

    Warning:  If the Mac hangs--and you have to Force Quit to
    regain control--be assured that something is corrupted
    somewhere.  Save any data you have open (as a different name
    from the original, in case what got corrupted were open
    files), quit immediately, and reboot the Amiga.

There are a number of other special keys.  Consult your Apple Macintosh
Reference manual for more details.

## 1.11  Floppy Disks

                            Floppy Disks

The .Sony disk driver is patched to use "multi-os.device" for disk
handling.  You can use AMIA (available from Utilities Unlimited) with a
real Apple 800K disk drive.

The Mac II family only supports two floppy drives and, currently, we also
only support two disk drives under the emulator.  This may change in the
future.

## 1.12  Hard Drives

                                   Hard Drives

Hard drives are supported in three ways.  AmigaDOS devices are supported
through standard device drivers, Virtual hard drives (hardfiles) are
supported through "emphf.device", and Macintosh hard drives are supported
through the EMPLANT's SCSI interface.

It is possible to use a real Macintosh formatted SCSI hard drive with a hard
drive controller other than the one on the EMPLANT board (such as the
A3000's internal SCSI).  Please read the documentation for the MAC_HDSetup
program for more details.

  AmigaDOS Partitions

AmigaDOS partitions are those partitions that the Amiga normally uses for
data storage.  These partitions can be on hard drives, SyQuest cartridges,
or any other format of fixed or removable data that has been setup for use
with the Amiga's normal operating system.

If you are unfamiliar with the creation of an AmigaDOS partition please
consult the reference manual for your hard drive controller, or seek someone
who is familiar with hard drive setups for help!

NOTE:  If you select an AmigaDOS device, it will be formatted as Mac data
and any Amiga data that was on it will be lost!  It only takes a few
seconds to destroy all of the data on your hard drive!  Please take care!

An AmigaDOS partition that is to be used for the emulation has some
restrictions.  First of all, it cannot be any larger than 1.96 gigabytes
in size.  Secondly, new partitions must be formatted by AmigaDOS before
the emulation can use them.  If the partition is not pre-formatted with
AmigaDOS format, the Macintosh's format routine will fail.  Lastly, the
partition must be mounted and available to the Amiga.

  Hardfiles

Hardfiles are just big files that simulate a hard drive partition.  The
advantage to using a hardfile is that no re-partitioning of an existing
hard drive is necessary.

Simply allocate the size of hardfile you want, format it, and you are ready
to go.  The disadvantage of hardfiles is their speed.  Typically, a hardfile
will be 1/2 the speed of the hard drive it resides on.

To get the best results out of a hardfile, it is recommended that you use
hard drive optimization software on the partition that contains the hardfile
(not the hardfile itself).

NOTE: Programs that call SCSI-Direct functions will not work with AmigaDOS
devices (or hardfiles).  AmigaDOS partitions and hardfiles are considered
to be "Volumes" (not devices) by the Macintosh emulation.  SCSI-Direct
functions can only be used with real SCSI devices attached to EMPLANT's
SCSI interface.

  Real SCSI Drives

Macintosh machines do not come with any type of formatting and partitioning
software.  Such software will need to be purchased in order to prepare your
hard drive for use with the Macintosh emulation.

We highly recommend a package called "SilverLining".  It supports removeable
media, and all known types of hard drives.

  Boot Order

It should be noted that a Macintosh (and the emulation) boots in a certain
order.  The boot priority of the emulator is as follows:

  1.  Floppy disks
  2.  AmigaDOS hard drive partitions and hardfiles
  3.  SCSI drives

## 1.13  Sound

                                  Sound

Audio is supported through Paula.  A buffer is maintained in fast memory
for the Macintosh audio output.  This buffer is then converted into an
acceptable form that the Amiga's audio device can handle.

NOTE:  ALL audio channels are permanently allocated while the emulation is
running, so any Amiga application attempting to use sound will fail.

## 1.14  Video

                                  Video

The user selects a video driver with the configuration program.  This driver
will then be used by the Macintosh emulation.  Multiple "monitors" are
supported if multiple video drivers are selected.

See Emulation Control Window for information about how to switch between
the Mac screen(s) and the Amiga screen(s).

Video is accomplished by use of a virtual NuBus card.  Since the video
emulation is done as a fake expansion card that looks (as far as the
Macintosh is concerned) like a real card plugged in, all modes and colors
may be changed from the Control Panel using Monitors and Colors.

See Video Driver Notes for more detailed information about video drivers.

## 1.15  Real-Time Clock/Parameter Ram

                        Real-Time Clock/Parameter Ram

The Macintosh Real-Time Clock is emulated in code and hardware.  The time

is initially taken from the Amiga using the DateStamp() function.  Make
sure your Amiga displays the proper time & date before running the
Macintosh emulation.  After the time & date information has been obtained
from the Amiga, the time & date the emulation uses is maintained through
hardware.

The parameter ram is loaded from its own configuration file at startup
(pram.config).  If this file is not found, the emulation creates default
values to use.

The parameter ram is saved when the emulation is quit using ShutDown from
the Macintosh menu or PowerOFF on the Amiga side.

## 1.16   Clipboard Sharing

                              Clipboard Sharing

The Macintosh and Amiga clipboards can be shared.  Just cut and paste using
the standard Amiga-C/V keys (universal key combo).  All text and graphics
translation is handled automatically.

Universal shortcut keys are as follows:
(Hold the Right Amiga key and press...)

  X Cut (Move the data into the clipboard)
  C Copy  (Copy the data into the clipboard)
  V Paste (Copy the data from the clipboard)

NOTE:  Some applications do not handle oversize clips.  This can be a
serious problem, especially with "TeachText" and "QED."  TeachText's clip
handling abilities are very limited--a maximum of 30,000 characters can be
pasted.

The maximum clip size can be adjusted by changing the Device Buffer in the
Memory control window.  The device buffer size is the size also setup for
the clipboard sharing buffer.  See Device Buffer

## 1.17   Restarting and Quitting

                             Restarting and Quitting

The Macintosh emulation may be restarted by selecting Restart from the menu
or by selecting the Restart gadget on the appropriate Macintosh requester
(i.e., a bomb).  Selecting ShutDown from the menu causes the emulation to
write out any remaining cached data to the drives, clear the screen, and do
a power off.

PowerOff causes the emulation launcher to save the parameter ram, remove
the emulation interrupts, processes, and memory, then exit.

## 1.18   Getting Started - Launching the Emulation

Getting Started - Launching the Emulation

Once you have installed the software, and obtained your ROM image, you are
all ready to setup the emulation.

To start the emulation setup, locate your EMPLANT: drawer and double click
on appropriate launch icon.

   HardLaunch_MAC

Using this launch icon will invoke the HardKickMMU program and run the
emulation setup.  Using this script will setup the emulation to run in 32
bit mode.  You cannot use this launcher if you have a SuperKickStart (soft
ROM'd) A3000.

   HardLaunch_24

Using this launch icon will invoke the HardKickMMU program and run the
emulation setup.  Using this script will setup the emulation to run in 24
bit mode.  You cannot use this launcher if you have a SuperKickStart (soft
ROM'd) A3000.


   EC_Launch_MAC

Using this launch icon just runs the emulation setup.  You can use this
launcher if you need to use the MMU for another application.  Using this
script will setup the emulation to run in 32 bit mode (24 bit mode is not
possible without an MMU).  If your CPU does not have an MMU, then you must
use this launcher icon!


   SoftLaunch_MAC

Using this launch icon will invoke the SoftKickMMU program and run the
emulation setup.  Using this script will setup the emulation to run in 32
bit mode.  You cannot use this launcher if you do not have a
SuperKickStart (soft ROM'd) A3000.

   SoftLaunch_24

Using this launch icon will invoke the SoftKickMMU program and run the
emulation setup.  Using this script will setup the emulation to run in 24
bit mode.  You cannot use this launcher if you do not have a
SuperKickStart (soft ROM'd) A3000.

The following programs are used in the above scripts for MMU machines.

   HardKickMMU/SoftKickMMU

These programs use the following command line options:

   -f  Turns on the FASTROM option
     (remaps KickStart into fast memory).

```
-w  Turns off CopyBack mode
    (turns on write-through, 68040 owners only).

-h  Remaps the EMPLANT hardware to appear at the same memory
    location that the Mac's hardware appears.

-t  Maps 4K pages with MMU for video display refreshing, does
    not mirror memory.  Will not work in 24 bit mode!!

-q  Supress screen flash, also known as DisplayBeep().
```

You can use either upper or lower case letters (ie. -f or -F).  Options may
be in any order.


## 1.19   Emulation Setup


                            Emulation Setup

Once the Emulation Setup screen is displayed, you will see three rows of
four "gadgets" (a gadget is any button or anything that excepts input from
either the mouse or the keyboard), and two gadgets at the bottom of the
screen, "Start Emulator" and "Start & Iconify".

There is also the standard system gadgets in both upper right & left corners
(close window, which exits the program, located in the upper left corner,
and Screen-to-back, which toggles to the next Amiga screen, located in the
upper right corner).

The emulation setup screen looks something like this:

```
      Memory              ROM  Image          Task Control
  Video  Display      PORT A Support        Hardware  Info
  Floppy  Drives      PORT B Support       Misc I/O Control
   Mass Storage           Devices           Configuration


      Start Emulator       Start & Iconify
```

Although it is advised that you set your Memory configuration as the last
step before running the emulation, an explanation of each gadget's purpose
will be explained in the order that the gadgets appear on the screen.


## 1.20   Memory Options


                            Memory

Clicking on the Memory gadget will cause a window to be displayed (see
Figure 1-1).

Since the Macintosh emulation (like all other emulations for EMPLANT)
multitasks with the Amiga's OS, it is necessary to set aside a certain
amount of memory for the emulation (so the Amiga side won't steal it!).

This is accomplished by dynamically allocating memory when the emulation is
first started.  This memory will not be returned back to the Amiga until
the emulation is shutdown.

This emulation setup window allows you to select the amount of free
(remaining) memory for each memory type displayed.  There are four
different types of memory that the Amiga can have/use:

  Chip Memory

The slowest of all memory types.  It is the only type of memory that must
contain graphics, sound, or disk data that is currently being used.

Due to the speed of this memory, it is not allowed to be used with the
emulation.

  Ranger Memory

This memory is commonly found in Amiga 500s, and is usually mapped from
$C00000 to $C7FFFF, but it can map even higher (as with some memory boards
from ICD, like the AddRam 540).  This memory is not considered to be fast
memory.  It is not mapped into the chip memory addressing, but the custom
chips will steal cycles from this memory due to the way the address
decoding is done.  This memory generally has the same speed as chip memory,
but cannot hold graphics, sound, or disk data that is currently being
used.  So, this memory is basically meant to hold program data and make the
system memory size larger.

Due to the speed of this memory, it is not allowed to be used with the
emulation.

  16 Bit Memory

This memory is true fast memory.  It is 16 bits wide (2 bytes).  This
memory is typically 2-3 times the speed of chip memory when added to a
stock 68000 based Amiga.  Use this memory only if you have to.  Only a few
real Macintosh models had 16 bit memory.

  32 Bit Memory

The best of all memory types, being 32 bits wide (4 bytes).  This memory is
typically 8-10 times the speed of chip memory when added to a 68020/30
accelerator board, depending on the speed of the processor and the
architecture of the accelerator.  Use this memory type for everything you
can!

                              Memory Functions

In the middle of the window you will see four "rotating" gadgets (each time
you click on a rotating gadget, different text will appear in the middle of
the gadget, replacing the last one seen).  Clicking on these gadgets will
change the memory type for each function that the emulation needs memory
for:

  System

Selects the memory type to be used for the Macintosh's system memory.

Select 32 bit memory if possible.

Once the memory type has been selected, you will need to select the amount
of system memory you want the emulation to use by clicking on the up/down
arrow gadgets to the right of the "MAC System:xxxx K" text.  You can select
any size from 256K to 99840K, in 256K increments.  This is how much RAM your
Macintosh will think it has.

NOTE:  If your system is set to 24 bit mode, you may not be able to use all
of the memory available (see Task Control for more details).

   ROM

Selects the memory type to be used for the Macintosh's ROM image.  Select
32 bit memory if possible.

The ROM image will take away 256K of memory from whatever memory type you
select.  This amount is reflected as soon as you toggle memory types.

   Video

Selects the memory type to be used for the video driver.  It is highly
important that this is setup to use 32 bit memory.  The faster this memory
is, the faster the video display will be.

The amount of memory used will depend on what kind of video driver you have
selected (see Video Drivers).

If you select your memory types before loading a video driver, the video
driver you select will deduct its required memory size from the Mac's System
memory amount you selected (see above).

See Video Driver Notes for more detailed information about video drivers.

   NuBus

Selects the memory type to be used for the fake NuBus slot.  The memory type
is not really critical here, however, it is still recommended that you put
everything you can in 32 bit memory.  The NuBus memory requirement is 64K,
and it will be taken away from what ever memory type you selected for it.

                          Device Buffer

This is the intermediate transfer buffer used by the AmigaDOS device
support.  This buffer lies between the Amiga and the Macintosh, and is the
link between the two different machines.

The size of this buffer is selectable by clicking on the up/down arrow
gadgets to the right of the "Device Buffer:xx K" text.  You can select any
size from 8K to 256K, in 8K increments.  The larger the buffer size, the
faster the device transfer rates will be to/from the emulation.

This buffer is not used if DMA Restrictions (see Devices) is off.

NOTE:  The built-in file transfer always uses this buffer as its link
between systems.  Selecting a larger device buffer (even though you may have
DMA Restrictions off) will greatly increase the file transfer rates.

NOTE:  The clipboard size is set as the size of the device buffer.
See Clipboard Sharing

Like all of the windows that are displayed for each of the emulation setup
options, there are two gadgets "OK" and "Cancel".  Clicking on "OK" will
save all of the current settings and return to the main setup screen.
Clicking on "Cancel" will exit to the main menu without making any changes.


## 1.21  Video Drivers

                              Video Drivers

Clicking on the Video Display gadget will cause a window to be displayed
(see Figure 2-1).

This window shows you available video drivers and allows you to select one
or more of them for use with the emulation.

See Video Driver Notes for more detailed information about video drivers.

  Video Driver Windows

Within this window, you will see two different driver windows.  The window
on the left contains a scrollable list of usable video display drivers.
These are all of the video drivers that can be used by the emulation.

The window on the right contains a scrollable list of selected video
drivers.  These are all of the video drivers currently selected for use
with the emulation.

You can scroll through the list of video driver names by either grabbing
the slider bar and dragging it, or by clicking on either the up or down
arrows located below the slider bar.

Only video drivers compatible with your system will be displayed in the
left window.

  Multiple Monitors

You can choose up to 6 different (or same) video drivers to use with the
emulation.  The order in which video drivers are selected determines the
order of screens opening; the order being sequential with the first in the
list having priority over all others.

Clicking on the "Clear >" gadget will clear the list of selected video
drivers in the right window.

Having more than one video driver will give the Mac emulation the ability
to have more than one "monitor" showing at the same time.  In reality, you
could have several video boards, each with their own monitor.  If your
video board supports a single monitor, you will be able to simply move the
mouse to the "monitor" (a separate screen) and the display will
automatically flip to that screen.

This can be a bit confusing, so we recommend that you consult your Apple system manual for a more detailed explanation of how multiple monitor support works.

   Video Driver Information

Clicking on a driver name in the right window will present another window (see Figure 2-2) showing you the information about the video driver.

Video Device Name - The filename of the video driver that you just loaded, followed by the version number of the driver.

Device Driver Type - A short description of the video driver's required video hardware (ECS/NTSC/PAL/AGA/other video boards).

Display Modes - A short list or explanation of the video display modes that are available using the selected video driver.  The amount of memory required for the selected driver will always appear on the last line of text.

In order to speed up the Amiga video drivers, a checkbox Refresh Table can be selected.  This will deduct however much memory it requires, if selected.

   Memory Required

Each video driver requires some memory (at least 64K for the NuBus slot space).  If you use multiple drivers that require a large of amount of memory, you may find that the system memory could be very limited, all depending on the amount of memory you have your in your system.

   3rd Party Video Boards

Currently, none of the 3rd party video boards support a way to "lock" a section of memory on the video board.  Because of this, Workbench emulators, paint programs, or any application attempting to use the video board while the Macintosh emulation is running, will suffer from some strange results... you will see overlapping images, distorted data, "mouse trails", etc.

Until this problem can be resolved (we would be more than happy to help any video board manufacturer with this problem), we recommend that you do not use any other application that uses the video board while you have the Macintosh emulation running.


## 1.22  Floppy Storage


                              Floppy Storage

Clicking on the Floppy Drives gadget will cause a window to be displayed (see Figure 3-1).

This emulation setup window allows you to select which Amiga floppy drive(s) will be used as an equivalent Mac floppy drive.  On all Macintosh computers, there is a maximum of two floppy drives allowed.  These are labeled as "internal" and "external."

The Mac IIx computer treats these floppies as "right internal" & "left internal," as both floppies (if two are installed) are built into the computer's chassis.  The Mac emulation also treats the drives as two internal units.

The Mac emulation uses the drive selected under Internal 0 as the "right internal" floppy, and the drive selected under Internal 1 as the "left internal" floppy.

Under the "Internal 0" and "Internal 1" text you will see all drives that are available to the emulation.  If one of the circle gadgets is "ghosted" (not solid, with a checker-board pattern in it), it means that the drive is not available to the emulation.  You can choose between the Amiga's DF0, DF1, DF2, & DF3 devices.

You can also choose AMIA--a disk drive interface for a real Macintosh 800K floppy drive--if you have this adapter installed.  AMIA allows you to read and write low density Macintosh formatted floppy disks.  This option is only available as Internal 0.

Macintosh 800K (low density) formatted disks cannot be read or written with a normal Amiga disk drive.  You need a real Macintosh disk drive (and AMIA).

The "Initial DOS" setup allows you to select whether the emulation will use the Amiga floppy drives when the emulation first starts up.

If you set the Initial DOS to "MAC", then the Amiga's floppy drives are locked out from use on the Amiga side.  This is indicated by showing the drive as "BUSY" on the Amiga's Workbench window.  During the time the drives are busy, the Mac emulation has complete control of the floppy drives.  It is possible to toggle the DOS type while the emulation is running.  (See Emulation Control Window for more information.)

If you set the Initial DOS to "Amiga", then the Amiga's floppy drives are free to use on the Amiga side while the emulation is running, and the Mac will not see any disks inserted into the drives selected under Internal 0 or Internal 1.

   Multi-os.device

A custom device driver "multi-os.device" was written to handle the floppy disk access.  This device driver has the ability to read and write EMPLANT (our own custom format), AMAX II, IBM 720K, IBM high density, Macintosh high density, and standard AmigaDOS disks.  (This driver can also read and write Atari ST formats.)

   Emulation Floppy Formats

Normally, the emulation reads and writes to floppies in a special format-- "EMPLANT" format.  Whenever you insert a disk during the emulation, "multi-os.device" decides what format the disk is and conveys that information to the Mac.  If the disk was formatted as EMPLANT or AMAX II then the disk should work just like a Mac reading a Mac disk.

If the disk is not recognized by the Mac system, the Mac will ask if you

want to initialize the disk.  If you select "Initialize" and then select
"Erase" on the next requester, the emulation will format the disk.

The emulation will normally begin to initialize the disk in EMPLANT format.
Before the formatting begins, however, you can decide which specific format
you want to use by holding down a key until the formatting starts:

```
  Format    Key
-------------------------------------
  AMAX     Ctrl
  IBM     Shift
```

NOTE:  You must have a special IBM program (like AccessPC, PCExchange, Apple
File Exchange, DOSInit, or DOSMounter) to use an IBM formatted disk with the
emulation.  The Mac cannot use IBM formatted disks without one.

Some programs initialize disks specifically with IBM format in mind.  These
will always format as IBM.  Finder, however, may require that you hold down
the key (shown above) in order to format correctly.

NOTE:  The above only applies to Amiga drives.  Mac drives with AMIA
hardware will only read, write, or format Mac disks.

You must have a high density disk drive to be able to read and write high
density disks (Macintosh or IBM).  You can use Commodore's own high density
drive (Chinon 357-A) or one of the 3rd party high density disk drives
available.

NOTE:  If you want to make an IBM 720K format disk with a high density
floppy in a high density floppy drive, you must first cover the HD detect
hole (the hole on the opposite side of the write protect hole).

The emulation uses multi-os.device without any type of user setup required.

  Disk Notification Messages

Since real Macintosh machines have an electronic disk eject (no button to
push), support was added to prevent "accidental" disk ejects and
notification of when to eject disks.

In the upper right hand corner of the Macintosh display (in the "title
bar") is where all notification messages will appear.

If you accidentally remove a disk from a floppy drive, a small "disk" will
appear.  It will have the drive number (0 for Internal 0, and 1 for
Internal 1) followed by an arrow pointing straight up.  When you see this,
just place the same disk back into the floppy drive and the notification
will disappear.

If you eject a disk (by either throwing it in the trash can, or by using
the command key sequence Amiga-E), an eject notification will appear.  The
small disk with have the driver number followed by "X", meaning eject.
This will remain displayed until you remove the disk from the floppy drive.

In the event that two disks were ejected or accidentally removed (or any
combination), two notification messages will appear, one for each disk.

## 1.23   Mass Storage

                          Mass Storage

Clicking on the Mass Storage gadget will cause a window to be displayed
(see Figure 4-1).

This emulation setup window allows you to select whether to use the SCSI
port located on the EMPLANT hardware (Option "B" or Deluxe EMPLANT boards
only).

To turn on the EMPLANT's SCSI port, click on the box gadget to the left of
the "Enable EMPLANT SCSI" text.

Additional options may soon be available.

## 1.24   ROM Images

                           ROM Images

Clicking on the ROM Image gadget will cause a window to be displayed (see
Figure 5-1).

This emulation setup window allows you to Load the ROM image that was
either created with the EMPLANT hardware (by dumping the ROMs from the
board to a disk file), or created on a real Macintosh using the ROM_INFO
utility.

To choose the ROM image created, click on the "Select ROM Image" gadget.
You will now see a file requester.  Select the ROM image that you saved in
your "EMPLANT:ROM_Images" drawer.

You can select the ROM image file by either high lighting the driver name
and clicking on Load, or by just double-clicking on the filename itself.

If you attempt to select a ROM image and you accidentally clicked on the
wrong file, no information about the ROM image will be displayed.  Just try
again.

After successfully selecting the ROM image file, the ROM Type and ROM Size
will be displayed at the top of the window.

  ROM Versions

Currently, only the Mac 256K ROMs are supported.  Following the ROM Type
will be "0178" (ID for 256K ROMs) and the file type the ROM image was saved
as.  The file type will be either a Mac Data file, or a MACBinary file.

Following the ROM Size will be 256K (size of the ROM image) and the version
number of the ROMs selected.

There were three known versions of the 256K ROMs released, v1.1, v1.2, &
v1.3.  The first two versions did not contain the code necessary to handle
high density Macintosh/IBM formatted floppies.  This support came with the

v1.3 ROMs.  Because of this, customers looking for ROMs will definitely
want to look for the older ROMs, as they have no real value to any
Macintosh service center or owner.

Even though the earlier ROM versions did not support high density floppy
drives, this support is available with the Macintosh emulation.


## 1.25   PORT A Support


                              Port A Support

Clicking on the Port A Support gadget will cause a window to be displayed
(see Figure 6-1).

This emulation setup window allows the user to select what port will be
used for the Macintosh's Port A support.

The rotating gadget below the "Port A Device" text, allows you to select
one of three different Port A locations:

  Amiga Serial

If "Amiga Serial" is displayed inside the rotating gadget, the Amiga Serial
Driver and Unit input boxes will be un-ghosted, allowing data to be
entered.  The serial device driver will be used for Port A support while
using the emulation.

To change the device driver name you can do one of two things.  You can
click on the disk gadget (to the left of the input box), which will display
a file requester, where the filename can be selected.  Or, you can also just
click inside the device driver input box and type the device driver name.
To change the unit number, you will have to click inside the unit input box,
and change the unit number.

You are not limited to the Amiga's "serial.device" (default setting).  You
can use any serial type of device such as Supra's Modem0.device and even
multi-serial board device drivers.

We have found that Commodore's standard "serial.device" (v37.4) is too slow
for high speed operations.  Later versions appear to function properly.

  Amiga Parallel

If "Amiga Parallel" is displayed inside the rotating gadget, the Amiga
Parallel Driver and Unit input boxes will be un-ghosted, allowing data to
be entered.  The parallel device driver will be used for Port A support
while using the emulation.

To change the device driver name you can do one of two things.  You can
click on the disk gadget (to the left of the input box), which will display
a file requester, where the filename can be selected.  Or, you can also just
click inside the device driver input box and type the device driver name.
To change the unit number, you will have to click inside the unit input box,
and change the unit number.

You will need the appropriate Macintosh printer driver for your particular
printer, just as you would with a real Macintosh.  The only real difference
is that you are re-directing the printer data to an AmigaDOS device driver
(generally parallel.device).

If you do not have the proper printer driver, contact the manufacturer of
your printer.

Generally, Port A is used for telecommunications, not printers, but either
port will work.

   EMPLANT Port A

If "EMPLANT Port A" is displayed inside the rotating gadget, the "AppleTalk
Speed" gadget will be un-ghosted, and the emulation will use Port A on the
EMPLANT hardware for the Mac's Port A (Port A is located closest to the
external SCSI connector).

If you did not purchase the serial option (or Deluxe) EMPLANT board, the
"EMPLANT Port A" text will not be seen when the gadget is rotated (by
clicking on it).

The serial ports on the EMPLANT hardware are capable of running at up to
four times the speed that AppleTalk runs at.  AppleTalk's speed is 230.4
kilobits per second.

You can select the speed at which the EMPLANT's Port A will run AppleTalk
by clicking on the rotating gadget below the "AppleTalk Speed" text.  You
can choose Normal, 2x Normal, 3x Normal, and 4x Normal.

NOTE: You cannot communicate with another Macintosh with anything but
Normal.  The higher data rates will only work between two or more EMPLANT
systems.

NOTE: Unless you are using special software, AppleTalk is never used on
Port A.  Port A is generally used for modems.


## 1.26   Port B Support

                         Port B Support

Clicking on the Port B Support gadget will cause a window to be displayed
(see Figure 7-1).

This emulation setup window allows the user to select what port will be
used for the Macintosh's Port B support.

The rotating gadget below the "Port B Device" text, allows you to select
one of three different Port B locations:

   Amiga Serial

If "Amiga Serial" is displayed inside the rotating gadget, the Amiga Serial
Driver and Unit input boxes will be un-ghosted, allowing data to be
entered.  The serial device driver will be used for Port B support while

using the emulation.

To change the device driver name you can do one of two things.  You can
click on the disk gadget (to the left of the input box), which will display
a file requester, where the filename can be selected.  Or, you can also just
click inside the device driver input box and type the device driver name.
To change the unit number, you will have to click inside the unit input box,
and change the unit number.

You are not limited to the Amiga's "serial.device" (default setting).  You
can use any serial type of device such as Supra's Modem0.device and even
multi-serial board device drivers.

We have found that Commodore's standard "serial.device" (v37.4) is too slow
for high speed operations.  Later versions appear to function properly.

   Amiga Parallel

If "Amiga Parallel" is displayed inside the rotating gadget, the Amiga
Parallel Driver and Unit input boxes will be un-ghosted, allowing data to
be entered.  The parallel device driver will be used for Port B support
while using the emulation.

To change the device driver name you can do one of two things.  You can
click on the disk gadget (to the left of the input box), which will display
a file requester, where the filename can be selected.  Or, you can also just
click inside the device driver input box and type the device driver name.
To change the unit number, you will have to click inside the unit input box,
and change the unit number.

You will need the appropriate Macintosh printer driver for your particular
printer, just as you would with a real Macintosh.  The only real difference
is that you are re-directing the printer data to an AmigaDOS device driver
(generally parallel.device).

If you do not have the proper printer driver, contact the manufacturer of
your printer.

   EMPLANT Port B

If "EMPLANT Port B" is displayed inside the rotating gadget, the "AppleTalk
Speed" gadget will be un-ghosted, and the emulation will use Port B on the
EMPLANT hardware for the Mac's Port B (Port B is located furthest away from
the external SCSI connector).  If you did not purchase the serial option
(or DELUXE) EMPLANT board, this "EMPLANT Port B" text will not be seen when
the gadget is rotated (by clicking on it).

The serial ports on the EMPLANT hardware are capable of running at up to
four times the speed that AppleTalk runs at.  AppleTalk's speed is 230.4
kilobits per second.

You can select the speed at which the EMPLANT's Port B will run AppleTalk
by clicking on the rotating gadget below the "AppleTalk Speed" text.  You
can choose Normal, 2x Normal, 3x Normal, and 4x Normal.

NOTE: You cannot communicate with another Macintosh with anything but
Normal.  The higher data rates will only work between two or more EMPLANT

systems.

NOTE: Port B is generally used for AppleTalk and printers.


## 1.27  Devices

                                        Devices

Clicking on the Devices gadget will cause a window to be displayed (see
Figure 8-1).

This emulation setup window allows the user to select what devices (other
than floppy drives) are to be used with the emulation.

   Device Windows

You will see two different device windows.  The window on the left contains
a scrollable list of usable devices.  These are all of the devices that can
be used by the emulation.  If your system contains a device that is not in
the list, it is because it cannot be used by the emulation.

The window on the right contains a scrollable list of selected devices.
These are all of the devices currently selected for use with the emulation.

You can scroll through the list of device names by either grabbing the
slider bar and dragging it, or by clicking on either the up or down arrows
located below the slider bar.

   Device Selection

To select a device to be used with the emulation, locate the name of the
device in the left window and click on it.  The name of the device will be
copied to the right window.  You can select up to 14 different devices to
be used with the emulation.  Each time you click on a name in the left
window, it will be added in the list displayed in the right window.

The order that you select the devices is important.  The emulation will
attempt to boot the system from the list of selected devices contained in
the right window, in the order that they appear.  If the first device is not
bootable, the emulation will try the next device in the list until a
bootable device is found.  If no bootable device is found, the emulation
will re-try again starting with the first device in the list.

This gives SyQuest owners the luxury of inserting a bootable cartridge
without having to "hurry up" before the emulation attempts to boot...or in
case you forgot to insert a bootable cartridge in the first place.

NOTE: The floppy drives always have boot priority over a hard drive or other
devices.  This is the same as a real Macintosh.

If you do not like the order that the devices were selected in, just click
on the "Clear >" gadget, and the selected devices list in the right window
will be erased.

   Device Information

If you click on the device name in the selected devices list, another
window will open displaying information about the device (see figure 8-2).

On the left side of the window will be the information about the selected
device.  This information is not important to the user, however, it could
come in handy if there was any question about the device's attributes.

There are two check-box gadgets on the right side of the window, Force
Write Protect and DMA Restrictions.

   Force Write Protect

Once you have a device setup, you might want to use the Force Write Protect
option.  This option does not allow any data to be written to the device
"write protecting" it.  Since the Macintosh OS is prone to frequent system
corruptions, these feature can come in very handy!

One word of caution when using this feature... be careful when using it
with your boot (System) partition.  Some Extensions/Inits may not like the
fact that they cannot alter the system partition, and may actually write
necessary code into the boot drive and retrieve it later... if the device
was write protected, the data would not be there, and the system could
crash.

   DMA Restrictions

The box gadget to the left of the "DMA Restrictions" text is for telling
the emulation if your hard drive controller(s) are DMA devices.  Please
consult your hard drive controller manual to see if your controller is
programmable I/O or DMA I/O (the EMPLANT's SCSI port is not a DMA device).

Amiga 3000's, the A2090 & A2091/A, and some GVP hard drive controllers are
DMA devices, and must have "DMA Restrictions" marked (default setting).

If your controller uses programmed I/O (A4000, A1200, Supra, IVS, etc.) you
can deselect this gadget (no check mark in the middle of the box).  Doing
so, will dramatically increase your drive speeds, often by as much as 200%.

Clicking on the "Exit" gadget will return you to the Devices window.

If you are running the emulation in 32 bit mode, you might be able to
turn off DMA Restrictions with some controllers.  The A3000's SCSI
controller can operate properly with 32 bit addressing mode and DMA
restrictions Off.


## 1.28  Task Control

                         Task Control Options

Clicking on the Task Control gadget will cause a window to be displayed
(see Figure 9-1).

This emulation setup window allows the user to select the priority of the
Mac II emulation, the addressing mode, the sound support, and the background

refresh rate.

  Priority

The task priority of the emulation will determine how much of the Amiga's
CPU time the emulation will take away from the total amount of CPU time
available.

Set the In Front task priority to the value you want when the emulation is
currently active (being used).  To set the value, click on the up and down
arrow gadgets until the desired value appears between the gadgets.

Set the In Back task priority to the value you want when the emulation is
not currently active (not being used).

To set the value, click on the up and down arrow gadgets until the desired
value appears between the gadgets.

Under normal circumstances, the emulation priority should be set to zero.
A priority of zero allows equal CPU time sharing with other AmigaDOS tasks.
Higher priorities, while sometimes increasing the emulation speed, may
prevent some Amiga tasks--such as screen blankers, device drivers, and CLI/
Shell windows--from running.

  Addressing Mode

The Addressing Mode is the mode which you want the emulation to run in.
You can choose between 24 or 32 bit addressing mode.  To choose which
addressing mode you want to use, click on the appropriate circle gadget.

The difference is that in 24 bit mode, the emulation (like a real Mac IIx)
is limited to a maximum of 8 megs of Macintosh system memory.  Also,
depending on your system, it is highly possible that even less memory can be
used due to the fact that mirroring of the memory is required to insure that
the Mac's memory is completely contained in a 24 bit address region.

Older Mac programs may produce a "Bus Error" in 32 bit mode (because they
are not "32-bit clean").

If you have selected 24 bit addressing, you are required to run the
HardKickMMU (or SoftKickMMU if you have a SuperKickStart A3000) program
before the emulation is started.  24 bit mode is not possible without an
MMU.

The actual Mac II, Mac IIx, and Mac IIcx cannot normally run under in 32 bit
mode.  32 bit mode is found on higher Mac models.

The following is a breakdown of the amount of memory the emulation can use
from various system configurations for 24 bit mode:

```
  Amiga Amount of Memory      Amount allowed for emulation
-------------------------------------------------------------------------
    4 megs of fast memory        512K-2048K
    6 megs of fast memory        512K-3584K
    8 megs of fast memory        512K-4096K
   12 megs of fast memory        512K-4096K
   16 megs of fast memory        512K-7168K
```

Remember, fast memory does not include chip memory. (chip memory can never
be used for the emulation.)

The Mac emulation requires a single contiguous (one chunk) of memory.

If you run any program(s) before the emulation is started, the amount of
memory available to the emulation (shown above) will be reduced by the size
of the program(s) run.  For example, if you run DirectoryOpus before you
start the emulation, you are likely to find 768K less memory available for
the emulation.

In 32 bit mode, there are no memory restrictions, and programs ran before
the emulation will not affect the emulation's available memory (unlike 24
bit mode).  To use the 32 bit mode, you must use Apple's System 7.1 or
higher system software.

Although a MMU is not required when using the 32 bit mode, it is highly
recommended that you use the Hard/SoftKickMMU programs regardless of the
mode you have selected.  This is due to the fact that the MMU is used to
increase the speed of the video drivers.  Using the emulation without a
Hard/SoftKickMMU program will result in a severe loss in video refresh speed
using 100% compatible video drivers.

   Sound Support

You can enable/disable sound support by clicking on the appropriate gadget
to turn it On or Off.

   Background Refresh

All of the video drivers support a Background Refresh rate.  This is how
often the Mac's video display is updated when it is not the active display
(you are not using it).  By setting the background refresh value to 2
seconds, then every 2 seconds the Mac's video display will be updated
(whether you can see the display or not).

This feature offers a quick way of checking up on what is going on in the
background without having to active the Mac's window.

To change the background refresh rate, click on the circle gadget to the
left of the value you want.


## 1.29  Hardware Info


                          Hardware Information

Clicking on the Hardware Info gadget will cause a window to be displayed
(see Figure 10-1).

This window displays the information about your EMPLANT system.

The EMPLANT Board Address is the physical address in the PIC (plug in card)
AUTOCONFIG space.  This space is where all Zorro II boards are mapped.  If
the EMPLANT hardware is the only board in your Amiga, its address will

always be $E90000.

The Auto-Logic Version for the Mac emulation is v1.5.  As other emulation
modules are released (and there is new Auto-Logic IC included with the new
emulation), the Auto-Logic version number will change.

The SIMM Socket may contain a ROM, RAM, ROM/RAM, or a processor SIMM
module.  All of these types of modules can be properly identified and will
be shown.  See SIMM Socket

The Auto-Boot Socket is the socket that should contain either a Static RAM
chip or an EPROM.  This is the socket that provides auto-booting ability
for hard drives and/or ram disks.

The DIP Sockets may contain ROMs, or SRAMs.  All of the various types of
ROMs and SRAMs can be identified (sometimes not always properly) and will
be shown.  If a ROM or SRAM is slower than 80ns, it may not be able to be
properly identified.  See DIP SRAM/ROM Sockets

The "SCC Option" refers to the serial port option available for the EMPLANT
hardware.  If you purchased this option, then the word "YES" should be
displayed.  If you purchased this option, and the word "NO" is displayed,
please contact Utilities Unlimited.  See Serial Ports

The "SCSI Option" refers to the SCSI interface option available for the
EMPLANT hardware.  If you purchased this option, then the word "YES" should
be displayed.  If you purchased this option, and the word "NO" is
displayed, please contact Utilities Unlimited.  See SCSI Controller

"Audio Digitizer" refers to the audio digitizer hardware on the EMPLANT
board.  At the time this manual was written, the software does not attempt
to locate this hardware, and three question marks (???) are displayed.
See Audio Digitizer

"Macintosh Sound" refers to the setting of the stereo/mono jumper on the
EMPLANT hardware.  The display will correctly indicate which position the
jumper was currently in when the emulation setup was started.  See JP6

## 1.30   Misc I/O Control

                                Misc I/O Control

Clicking on the Misc I/O Control gadget will cause a window to be displayed
(see Figure 11-1).

This emulation setup window allows you to select which external I/O device
driver will be used by the emulation.  You are required to LOAD an external
I/O driver.

Click on the Load New Driver gadget.  You will now see a file requester.
Select the external I/O driver you wish to use from the "EMPLANT:Ext_IO"
drawer.  You can select the external I/O driver by either hi-lighting the
driver name and clicking on Load, or by just double-clicking on the driver
name itself.

If you attempt to Load an external I/O driver and select the wrong file, you will see an error message telling you that the file you selected was not a video driver.  Just try again.

When loaded, the external I/O driver description will be displayed.

Device Driver Name – The filename of the external I/O driver that you just loaded, followed by the version number of the driver.

Device Driver Type – A short description of the external I/O driver type (ADB, NuBus, etc.).

Driver Description – A short list or explanation of the external I/O driver functions.

Currently, there are two drivers.  One is called, "Std_ADB".  This is the standard Apple Desktop Bus emulation driver.  This driver controls the keyboard, mouse, and mouse buttons.  The other one is "ISO_ADB".  This is for support of European keyboards.

  Mouse Emulation

In the lower/right corner of the window you will find a gadget below the text, "Mouse Emulation".  This is a rotating gadget that allows you to select the type of mouse emulation you want to use.

  Hardware Mouse Emulation

This type of mouse emulation uses the EMPLANT's hardware and the Amiga's mouse hardware to handle the move movements.  Mac programs that access the Apple Desktop Bus hardware directly, bypassing system routines, will still work with the Mac emulation.  For this reason, hardware emulation will be the most compatible.

The mouse buttons are also checked on a hardware level.  This is accomplished by looking at the mouse button registers in the Amiga hardware.

  Software Mouse Emulation

This type of mouse emulation uses the EMPLANT's hardware and the Amiga's mouse movement events passed to Intuition by the input.device.

The advantage of using this type of mouse emulation is that any device that sends "rawmouse" events to Intuition can be used to control the Mac's mouse and mouse buttons.

This means that devices such as graphics tablets, lightpens, trackballs, analog joysticks, and even the Nintendo PowerGlove can be used to control your Mac emulation.

CalComp graphics tablets need to have their mouse positioning mode set to "relative" in the AccuPoint software.

## 1.31  Configuration

Configuration

Clicking on the Configuration gadget will cause a window to be displayed
(see Figure 12-1).

This emulation setup window allows the user to Load or Save a configuration
file.  A configuration file consists of all of the settings for each
configuration menu (all items listed under Emulation Setup in the Table of
Contents).  We have decided to keep config files in the Amiga's "S:"
directory, however, you may keep them anywhere.  You may have multiple
configuration files by giving them different names.

The filename "MACII.config" will always be the default filename that the
emulation software will attempt to find when it is initially started.  If
you want to use a different configuration file, you will have to Load it
yourself.

To Save the currently setup configuration, click on the Save gadget.  A
file requester will be displayed.

You can Save the config file by either hi-lighting the config name (default
being MACII.config) and clicking on Save, or by just double-clicking on the
config name itself, or by entering the filename manually and pressing the
Return key.

To Load a previously saved config file, click on the Load gadget.  A file
requester will be displayed.  You can Load the config file by either hi-
lighting the config name (default being MACII.config) and clicking on Load,
or by just double-clicking on the config name itself, or by entering the
filename manually and pressing the Return key.

If you accidentally selected the Configuration gadget, or do not wish to
Load or Save a config file, click on the Abort gadget to return to the main
emulation setup window.

## 1.32  Starting up the Emulator

Starting up the Emulation

There are two ways to start the Macintosh emulation.

  Start Emulation

Clicking on this gadget will open the Emulation Control Window and start
the emulation running.

  Start & Iconify

Clicking on this gadget will shrink the emulation setup screen into a small
icon on your Workbench and start the emulation running.

To un-iconify the emulation, double-click on the Workbench icon.  This will
erase the icon and display the Emulation Control Window.

If you drop a file icon or a drawer onto the Workbench icon, the file
transfer process will start and begin transferring those files to the
emulation.  See File Transfer.

Once the emulation is started there will be a 5 to 10 second delay before
the emulation starts.  This is normal.

If there is an error in the emulation setup, a window will open describing
what went wrong.  There are 38 error messages contained in the software,
covering all possible problems.

After another few seconds, the Mac's video display will appear.

If you have not selected a bootable device, and there is not a floppy disk
in the disk drive, you will see our EMPLANT logo (random each time the
emulation is started) and a little "disk" in the center of the screen.
Inside of the disk will be a flashing question mark "?".  The Macintosh is
asking you to insert a bootable device, which can be a floppy disk, or
removable media of some sort.

## 1.33  Emulation Control Window

                              Emulation Control Window

   Switching Between the Amiga and the Emulation

After the emulation is started, you can flip back to the Amiga side by
pressing Left-Amiga-M (move the next screen to the front) or Left-Amiga-N
(move the Workbench screen to the front).

NOTE:  The mouse pointer will disappear when the emulation has started.
This is normal.  Even if you flip back to Workbench, the pointer will still
be gone (unless you are running "AutoPoint," which automatically activates
any window your pointer is over).  To get your pointer back, move the mouse
down to the bottom of the pad and click the left mouse button.  The pointer
should re-appear.

If you flip through the screens (and if you have not iconified the window)
you will find the Emulation Control Window (see Emulation Ctrl Window).
This window allows you to adjust certain parameters and transfer files to
the Mac emulation.

   Video Refresh Rate

It is possible to change the video refresh rate while the emulation is
running.  To change the rate, click on the up and down arrow gadgets to the
right of the "XX FPS" text (where XX is the current refresh rate).

   Floppy DOS Type

As noted earlier, it possible to change the Floppy DOS Type while the
emulation is running.

To change the Floppy DOS Type to AmigaDOS, click on the circle gadget to the
right of the "Amiga" text.  To change the Floppy DOS Type to MAC DOS, click

on the circle gadget to the right of the "MAC" text.

   Power OFF Gadget

If the emulation gets into a state where it hung, or will not shutdown, the
TURN POWER OFF (Window) gadget can be used to quit the emulation.  This is
exactly like turning off or unplugging the power from a Macintosh (or
emulation in this case), so please be aware that any unsaved data will be
lost!  When you click on the TURN POWER OFF gadget, another window will
open warning you that data could be lost.  This window also serves as a
safety feature in case you accidentally selected the TURN POWER OFF gadget.

   File Transfer

Having the ability to transfer files back and forth between platforms is
essential for an emulation.  Click on the File Transfer gadget to bring up
the File Transfer Window.

To transfer files between the emulation and the Amiga, select whatever
options you want and then select the Start gadget to begin transferring.

While the transfer is taking place, the Exit gadget turns into an Abort
gadget, which will stop the transfer at any time.

The Exit gadget lets you exit the File Transfer Control window and return to
the Emulation Control Window.

NOTE:  Make sure that "Finder" is to the front before transferring files.

   Transfer Direction
This rotating gadget lets you select which way you want to transfer files:

MAC -> Amiga:  Transfer from emulation to the Amiga.

When the transfer is started a file requester appears on the emulation
desktop.  In single file transfer you are selecting the file you wish to
transfer.  For the other methods you are selecting any file out of the
directory in question.

In selective mode the directory is scanned and a dual-window appears.  The
window on the left shows you the contents of the directory and the window on
the right shows the selected files that will be transferred.  Clicking on a
file in the left window copies the name to the right window.  At this point
a file requester appears on the Amiga side asking where you wish the file(s)
to be saved.  The file, directory or selected files are transferred using
the selected type.

Amiga -> MAC:  Transfer from the Amiga to the emulation.

When the transfer is started a file requester appears on the Amiga side.
In single file transfer you are selecting the file you wish to transfer.
For other methods, you are selecting the directory in question.

In selective mode the directory is scanned and a dual-window appears.  The
window on the left shows you the contents of the directory and the window on
the right shows the selected files that will be transferred.  Clicking on a
file in the left window copies the name to the right window.  At this point

a file requester appears on the emulation desktop asking where you wish the file(s) to be saved.  The file, directory or selected files are transferred using the selected type.

   Transfer Method

File:  Lets you select individual files to transfer one at a time.

Directory:  Lets you transfer a whole directory at a time.  (Transfers everything in the directory!)

Selective:  Lets you transfer selected files from a directory.

   Transfer Type

Intelligent:  All MACBinary and text headers are handled automatically.

Use this mode for most transfers from the Amiga to the emulation.

MACBinary:  Files transfered from the emulation to the Amiga are always saved in MACBinary format.  Files transfered from the Amiga to the emulation are converted to Mac format if they are in MACBinary format.

Use this mode for transferring files in which you want to retain all Mac information (i.e., the type and creator).

Data Fork:  Transfers only the data fork of each file to the Amiga. Transfers only the data fork of each file to the emulation if the file is MACBinary format.  Otherwise, the whole file is transferred to the emulation.

Use this mode for transferring video files from the emulation to the Amiga.

Resource Fork:  Transfers only the resource fork of each file to the Amiga. Transfers only the resource fork of each file to the emulation if the file is MACBinary format.  Otherwise, the file is not transferred.

Useful for developers.


   Re-Mount Ejected

If you click on the "Re-Mount Ejected" gadget, all devices that have been thrown away will be re-mounted.  This is ideal for SyQuest units and other removable media.  Before you switch a cartridge, just throw it away from the Mac's desktop to the trash can.  Now, you can safely eject the cartridge and insert a new one.  When you want the Macintosh to see the new cartridge, just switch screens (to the emulation control window) and click on the "Re-Mount Ejected" gadget.

When you switch back to the Mac screen, you will find the device on the Mac's desktop (or a message telling you that the device is not valid, and asking if it should be formatted).

   Cache Control

Since the 256K ROMs used with EMPLANT's Macintosh emulation were created

long before the 68040 processor was developed, we have added the ability to
toggle the state of the instruction and data caches.  Turning off the data
cache will also turn off CopyBack mode.  If you experience a problem with
an application, try turning off one or both of the caches.

The current state of the caches is reflected by the gadgets when the
Emulation Control Window becomes active (by clicking anywhere within the
window boundary).  You can change the state of the caches any time you like,
however, it is recommended that you do not change the caches during the
bootup.

Also remember that there is an Amiga on the other side, using the same
caches as the Macintosh emulation.  Changing the state of the caches will
effect both sides.

## 1.34  Compatibility

Compatibility

The EMPLANT Macintosh emulation module is not a real Macintosh, and as such
some problems with compatibility are to be expected.

Most notably is drive support; the Macintosh disk interface is emulated in
software.  Any program going lower than the disk driver interface will most
likely fail.

Another problem concerns memory.  Most programs on the Macintosh are
relocatable and do not care where they are loaded; some early programs (most
notably games and PD software) do care where they are loaded and may not run
properly.

Some other compatibility issues may concern you, such as the following:

    Things to Watch Out For
    68040 Compatibility

If you find an incompatible program, place a message on our BBS telling us
the name of the program and how it fails.  We may be able to find some way
to correct the problem and update the emulator.

## 1.35  Things to Watch Out For

Things to Watch Out For

Any program that pokes the hardware directly might not function.  Although
the EMPLANT hardware can be made to look identical to a real Mac, there are
still some quirks created by not having the Mac emulation's memory in the
exact same location as a real Macintosh.  Some older games that rely on
certain memory locations to load into could not only fail, but could also
corrupt memory on the Amiga side as well!

## 1.36  68040 Compatibility

```
                          68040 Compatibility
```

If you have a 68040 processor in your Amiga, you are required to run System
6.0.7 or newer.  NOTE:  Real Macintosh computers using the 68040 processor
(like the Quadra) require System 7.0.1 or newer to work.  We have patched
many of the problems created by the 68040's CopyBack mode with the older
system software, but it is recommended that you use Apple's latest system
software for best compatibility.

## 1.37  utilities

```
                          EMPLANT Utilities
```

In order to get the most out of your Mac emulator, we have developed the
following storage utilities:

  Disk Converter

    Converter allows you to copy between several different disk
    formats.  File archives can be also created or extracted.

  MAC_HDSetup

    Creates the mountlist entries you may need for using a real
    Macintosh formatted hard drive with your SCSI controller.

  HardFile Setup

    Creates a file that you can use like an extra hard drive!

## 1.38  Disk Converter

```
                          Disk Converter II
```

Disk conversion is accomplished using the Disk Conversion Utility.  Disks
or disk image files may be converted into one of many different formats.

Formats that are supported at the time of this writing are:  Macintosh 800K
(low density), 1.44mb (high density), IBM 720K (low density), AMAX, and
EMPLANT.

Low density Macintosh disks require AMIA (AMIA uses a real Macintosh floppy
drive connected to it), in order to read and write this type of disk format.
High density disk formats require Commodore's high density floppy.

  Selected Disk

Below the text "SOURCE" and "TARGET" are two rotating gadgets under each.
The upper gadget lets you select which device you want to use, and the lower
gadget lets you select the format.

If you select "IMAGE" for the format, the upper gadget will be ghosted, and
the data will be retrieved from or stored to a file instead of a device.

If you don't select "IMAGE" then you can choose between one of your floppy
drives or "AMIA" if you have an AMIA adaptor.

   Source Format

There are only two choices that are selectable, either AUTO or IMAGE.  Click
on the gadget to toggle between these two modes.

If AUTO is selected, the converter will determine what disk format the disk
is, and setup its internal parameters accordingly.  If the disk format can
not be determined, an error message will be displayed.

If IMAGE is selected, the converter will read as much of the file into the
Amiga's memory as possible (nearly 1.5 megs of memory is required for a
high density disk image), and setup its internal parameters accordingly.
If the file type is not recognized, an error message will be displayed.

   Target Format

The TARGET format can be set to EMPLANT, AMAX, 720K, 1.44mb, or IMAGE.
If you select IMAGE then the disk will be converted into a file image.

   Conversion

To start a disk conversion/copy, click on the START COPY gadget and follow
the on-screen instructions.  You will be prompted to insert a SOURCE disk,
or TARGET disk, or a file requester will appear, all depending on the
conversion you have setup.

When you insert a disk, wait for the drive activity to finish first, then
continue to copy.

Options for the copy process include VERIFY and MULTICOPY.  These options
are not available if you use IMAGE as the TARGET format.

VERIFY makes very sure that the copy is a good one.  MULTICOPY allows you to
make another copy when the copy is done.

NOTE:  All source disks must be write protected for the converter to even
allow them to be read.  This is for your own protection, and not meant as an
inconvenience.

Once the conversion process has started, the progress is charted in a grid
on the left side of the interface.  Errors in reading information are
indicated by yellow blocks.  Errors in writing information are indicated by
red blocks.

To stop the conversion process at any time, select the ABORT COPY button.


## 1.39   MAC_HDSetup

MAC_HDSETUP

The MAC HDSetup program was created for those customers that did not
purchase EMPLANT with the SCSI option because they already had a SCSI
controller.  This software will create the necessary mountlist entry(s) for
a real Macintosh formatted hard drive with any SCSI controller.

When you run the program, a device list is displayed (similar to the device
lists in the Device window of the emulation setup).  This is the list of
devices that the Amiga knows exist.  If the device you want to use is not
in this list then either it cannot be used, or more likely, is not mounted.
If the device is not mounted, the software can scan the SCSI bus to find the
necessary information.

You have the choice of the software generating either a DOSDriver or a
MountList entry.

If you click on any device name in the list, information about the device
will be displayed to the right of the device list window.  If the device is
in AMAX format, it will tell you so, and it will also tell you if the AMAX
partition is bootable or not.

If you click on a real Macintosh device (mounted), then another window will
open and you will see information about the hard drive (see MAC Drive Info).

Clicking on SCAN SCSI BUS will bring up another window allowing you to
enter the name of the SCSI device driver that controls your hard drive
(scsi.device is the default for A3000 machines).  You will need to know the
SCSI Unit ID # for your SCSI drive, and enter that value into the UNIT
gadget field.  If the device is recognized as Macintosh then another window
will open and you will see information about the hard drive.

NOTE:  If the length of the HFS partition is not a multiple of the starting
block number, (i.e., the length is divisible by a multiple of the starting
block number--for example:  start block number = 31, length = 10240 blocks;
there is no multiple between 10240 and 31; if the start block number is 32,
this would work) no actual DOSDriver or mountlist will be created.

Click on the "NEXT" gadget until the "Add to Mountlist" (or "Create
DOSDriver") gadget is unghosted.  Once it is, look at the partition name
and decide if this is a partition that you want the Macintosh emulation to
have access to.  If so, then click on the gadget.  A file requester will be
displayed.

You should save the created mountlist entry to your "DEVS:" directory
(Mountlist Entry), or save the DOSDrivers into your "DEVS:DOSDrivers"
directory (DOS Driver).

Continue the above process until all partitions you wish to use have had
mountlist entries created for them.


   Mounting the Device

If you chose to create mountlists, you will have to MOUNT the device(s)
before running the emulation.  You can either add the "MOUNT" command(s) in

your startup-sequence, or to the Hard/SoftLaunch script file.  Your mount
command should look like this:

MOUNT XXXX: from DEVS:<MountList Name>

Where "XXXX:" is the name of the device (determined by the MAC_HDSetup
program, but you can change it to whatever you like), and <MountList Name>
is the filename you saved the mountlist entry as.


## 1.40   HardFile Setup

                           HardFile Setup Utility

   What is a HardFile?

A HardFile is a file of any length that appears to be a hard drive to the
Amiga's OS.  HardFiles are block-level devices, having DOS-ENVC entries
like normal hard drives.

HardFiles are used by Commodore's Bridgeboard system and PC-Task (software
IBM emulator written by Chris Hames).

The HardFileSetup program was designed to make things easier on the user.
It has the ability to create hardfiles of user-defined length and also
create the mountlist associated with the hardfile.

   Creating HardFiles

Choose the HardFile type you want to use by clicking on the rotating gadget
below the text "HardFile Type".

You can choose either EMPLANT, PC-Task, Bridgeboard, or Floppy Disk.
When you click on PC-Task or Bridgeboard, you will notice that the
"FileSystem" box's contents changes to "CrossDOSFileSystem".  This is
because these FileTypes are MS-DOS based.  When you click on Floppy Disk
the "FileSystem" box changes to "MultiOSFileSystem."  You can use any
FileSystem you would like.

Once you have selected the HardFile type, select the size of the hardfile
you wish to create.  If you have selected PC-Task or Bridgeboard as the
file type, you can only increment in 1 meg blocks.  If you selected EMPLANT
as the file type, you can increment in 64K blocks.

If you select Floppy Disk as the file type, the size you select can be
720K, 800K, or 1440K.  (This gives you IBM, Mac, or high density size.)

Once the size has been selected, choose the FileSystem that this device
will be using.  If you leave the FileSystem box blank, then FastFileSystem
will be used.

Choose the type of mounting setup you want to use, either a Mountlist Entry
or a DOSDriver.

If you selected EMPLANT as the file type, then the file generated by the
"Create HardFile" option will be called "EmpHardFile*" (where the * is the

UNIT number).

If you selected either PC-Task or Bridgeboard as the file type, then the
traditional filename of "hardfile*" will be generated (again, with the *
being the UNIT number).

If you selected Floppy Disk as the file type, then the file generated by the
"Create HardFile" option will be called "FloppyImage*" (where * is the UNIT
number).

Please remember that only 16 units (0-15) are supported and you cannot have
the same unit number for a different file type.  (For example: EmpHardFile0
and HardFile0 could not be mounted at the same time or a conflict will occur
due to both devices using unit 0.)

When you select "Create HardFile" a PATH requester will appear, asking you
where you want the file created.  Once you have selected the PATH, a window
will appear showing you the pending operation's information.

If it is acceptable, click on the "OK" gadget, if not, click on the
"Abort" gadget.

If you click on the "OK" gadget, any previously created hardfile with the
same name will be erased and then a new hardfile will be created.

Once the hardfile has been created, there will be about a three second
pause and then you will see the main menu again.

  Creating Mountlist/DOSDriver

Now that you have created the hardfile, you should immediately create the
mountlist (don't alter any gadgets at this time).  Click on the "Create
Mountlist" (or Create DOSDriver) gadget.

You will see a window open and a text requester asking for the name of the
device will appear.  Enter the name that you want to call your device
(DH0:, VD0:, SH6:, etc.) and press Return.  Click on "OK" if you are ready
to create the mountlist or "Abort" if you change your mind.

Clicking on "OK" will bring up a file requester asking you where you want
the mountlist saved to.  Mountlists usually are stored in your "DEVS:"
directory.  That's it!  Exit the setup program.

  Using the Device

The first step in using the device is making an assignment.  In order to
use the emphf.device, you must assign "EMPHF:" to the same place where your
HardFile was created.  For example, if you created a hardfile on your DH1:
partition, then your assignment would be:

assign EMPHF: dh1:

If you created an MS-DOS compatible file (PC-Task or Bridgeboard file type),
then you must use this assign:

assign HF: dh1:

Once the assignment has been made, you need to MOUNT the device.  If you
used the device name of "Test", then you would mount the device like this:

mount Test: from devs:MountList_Test


Under OS 2.04 (Kickstart 37) and later, there has been the ability to put
the mountlist created in the "Devs:DOSDrivers" drawer.  Any device's
mountlist in this drawer will automatically be mounted when your system
boots.

Now, if you type:

cd Test:

You should get a system requester telling you that the device is non-DOS.
You must format the device before you can use it.  You can use the Amiga's
"FORMAT" command for this, or "Format Disk..." from Workbench.

NOTE:  Do not format a PC-Task or BridgeBoard type hardfile with the Amiga's
format command....format these hardfiles only with the emulator it is
running with!.

Once the device is formatted, you can treat it just like a hard drive.


## 1.41  Trouble Shooting

Trouble Shooting

Error Messages

OS Error! - Can't Open Any Screens!  (Recoverable Alert)

Many of the programs associated with the emulation force NTSC 640x200
screens open, regardless of the display mode the machine is currently in.
You will need the "NTSC" monitor in your DEVS:MONITORS drawer or NONE of
the EMPLANT software will function.

MAC II Emulation Already Running!  (Recoverable Alert)

RsrvMemII was not run before the emulation software was started.

Low Memory Not Reserved - Run RsrvMem! -

RsrvMemII must be run TWICE before the emulation can run.  The first time
reserves the first 16K of memory for the emulation multitasking control
module.

Multitasking Not Patched! - Run RsrvMem! -

RsrvMemII must be run TWICE before the emulation can run.  The second time
patches multitasking to allow supervisor mode task switching.

Soft/HardKickMMU Not Active!  Use Soft/HardLaunch! -

Either SoftKickMMU, or HardKickMMU must be run before the emulation
software.  Check the Launch script.

ROM Image Not Selected or Incompatible! -

Select a ROM Image file in the setup menu.

ROM Image File Not Found! -

The ROM Image filename has illegal characters in the filename.  Rename the
file.

ROM Image corrupted - Invalid Checksum! -

The ROM image file you are using is corrupted.  This can be caused by
moving the ROM image to the Amiga from a Macintosh, using MS-DOS disks.
MAKE SURE no translations are active (consult your MS-DOS disk emulation
manual for details about file translation options).

Invalid ROM - ID Word Incorrect! -

The ROM Image file is not a 256K ROM image.  Obtain the proper ROM image
file.

ROM Image Not Mirrored - MMU Failure! -

If you see this message, you are either using a 68020/030/040 without an
MMU, or your MMU has failed.  Replace the part with a functioning one.

External I/O Driver File Not Found! -

Select an External I/O Driver in the setup menu.

Can't allocate 32 bit memory! -

You have selected too much memory for the Mac SYSTEM.  Reduce the memory
size.  If you have run any programs BEFORE the emulation is started, your
memory may be too fragmented for the emulation to run.  If this is the
case, just reboot your machine.

Unable to Allocate any 16 bit Memory! -

You have selected too much memory.  If you're running in 24 bit mode,
try using 32 bit, if you can.  If this doesn't work, try reducing the
amount of memory you're using.  If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Video Driver File Not Found! -

Select Video Display in the setup menu and verify that the video driver
is available.

Serious Problem - Unable to Start Video Process! -

Try rebooting the computer.  Some important lists have probably been
corrupted.

Problem - Unable to Start Emulation Process! -

Try rebooting the computer.  Some important lists have probably been
corrupted.

No SYSTEM Memory Selected! -

Select Memory in the setup menu and select some system memory.

Unable to Allocate SYSTEM Memory - Reduce SYSTEM Size -

You have selected too much memory.  If you're running in 24 bit mode,
try using 32 bit, if you can.  If this doesn't work, try reducing the
amount of memory you're using. If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Unable to Allocate VIDEO Memory! -

Reduce the system memory size.  Some video systems devour memory after
you start them running.  If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Unable to Allocate ROM Image Memory! -

Reduce the system memory size. If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Unable to Allocate NUBUS Memory! -

Reduce the system memory size. If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Not Enough Memory For Device Transfer Buffer! -

Reduce the system memory size. If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Unable to Open AmigaDOS Device! -

There is a device selected that has not been properly mounted.  The mount
list or the DOSDriver has an error in it.  The device driver may also be
corrupted.

This EMPLANT emulation module requires a 68020+ CPU -

Check your CPU.  It must be 68020 or newer.

At Least One Video Device Driver Must Be Selected! -

Select Video Display in the setup menu and select a video driver.

Too much MAC System memory selected! -

You have selected too much memory.  If you're running in 24 bit mode,
try using 32 bit, if you can.  If this doesn't work, try reducing the
amount of memory you're using.  If this doesn't work, look at the number of
video drivers you have selected--keep this number at one, if possible.

Hey!  Please set ALL memory types or I can't run! –

Select Memory in the setup menu and select all the memory types.  (Use
32 bit wherever you can.)

Serious Problem – Unable to Setup External IO Driver! –

Make sure that the I/O driver you select in Misc I/O is "Std_ADB."  If it
is, then the driver could corrupted.

Unable to Initialize the Video Hardware! –

Select another video driver or reduce the amount of system memory.

Unable to Initialize the Audio Hardware! –

All channels must be free for use.  So, quit out of that music program or
whatever is using them.

MMU mapping not setup to run in 24 bit mode! –

Reboot the Amiga and run HardLaunch_24/SoftLaunch_24.  If your CPU does not
have an MMU, you cannot run in 24 bit mode!

32 bit mode REQUIRES no less than 1792K System Size –

System 7.1 requires no less than this amount of memory to start up.  If you
are using too many video drivers, reduce the number to one.  If the video
driver uses a large number of colors, try using a driver that does not.  If
you cannot increase your system size, then reduce the amount of memory the
Amiga is using, or get more memory!

Unable to Open Serial Device Driver! –

The serial device is probably already in use.  Try quitting out of whatever
program is using the serial device.

Unable to Open Parallel Device Driver! –

The parallel device is probably already in use.  Try quitting out of
whatever program is using the parallel device (i.e., parnet).

Unable to Open 'multi-os.device'! –

Make sure that your copy of "multi-os.device" is installed in the DEVS:
directory.

Unable to Open 'clipboard.device'! –

Make sure that your copy of "clipboard.device" is installed in the DEVS:
directory.

Can't Setup Clipboard Hook! Update 'clipboard.device' –

EMPLANT's Mac emulation requires "clipboard.device" version 36 or newer.

Unable to Open 'amia.device'! –

Make sure that your copy of "amia.device" is installed in the DEVS:
directory.  Make sure that you also have the adaptor installed.


                              General Problems

Insert Volume EMPLANT into any drive (System Requester)

The EMPLANT: assignment is missing.  Make sure that your USER–STARTUP's
last line reads:

execute >NIL: AssignEMPLANT

Make sure that you have the file "AssignEMPLANT" (created by the installer
program).

A hard drive (or SyQuest cartridge) from a real Macintosh is not recognized
when attached to EMPLANT's SCSI port...why?

You may not have the SCSI port enabled.  Check in the MASS STORAGE setup
menu.

When I start the emulation, all I get is a black screen..why?

Your processor does not have a functioning MMU, or never had one to start
with.  Many "EC" processors have partially functioning MMUs.  Replace the
processor with a non–EC version or use the EC_Launch_MAC icon to start the
emulation.


## 1.42   Copyright and Trademark Acknowledgements


                   Copyright and Trademark Acknowledgements

Apple, and the Apple logo, AppleTalk, ImageWriter, LaserWriter, Mac, and
Macintosh are registered trademarks and Finder, and MultiFinder are
trademarks of Apple Computer, Inc.; NuBus is a trademark of Texas
Instruments; Amiga is a registered trademark of Commodore–Amiga, Inc.;
AUTOCONFIG is a trademark of Commodore Electronics Limited; Atari and ST are
registered trademarks of Atari US, Corp.; Amax is a trademark of ReadySoft
Inc.; PhotoShop is a trademark of Adobe, Inc.; FreeHand is a trademark of
Aldus, Inc.; SYBIL is a trademark of Jim Drew; EMPLANT is a trademark of
Jim Drew & Utilities Unlimited, Inc.

This manual may not be reproduced in any form including, but not limited
to, facsimiles, electro–magnetic media, optical media, telephone modem, or
scanners, without express written permission of Jim Drew and Utilities
Unlimited, Inc.

Copyright © 1993 By Jim Drew & Utilities Unlimited, Inc.

## 1.43  Video Driver Notes

Video Driver Notes

This emulation is a color emulation, but a freshly installed Mac system will
be in Black & White mode.  In order to get the Mac to give you a particular
number of colors, you must choose "Control Panels" from the Apple menu, then
double-click on the "Monitors" control panel.  Now, select the "Colors"
button and the number of colors you want displayed.  These changes will
occur immediately.  Consult your Apple Macintosh Reference manual for more
details.

Most drivers allow different size screens.  To change the screen size, go to
the Monitors control panel on the Mac and select "Options."  This will show
you a list of supported screen sizes.  Select the size you want, and then
either Restart or Shutdown from the Mac menu.  Restart will let you use the
new mode, but will not save it; Shutdown saves the newly selected mode.

The "QD" extension to a video driver's name indicates that it is a system-
level driver.  These do not require the MMU to work, and they are quite
fast.  The only drawback to using these drivers is that any programs that
store data directly to the video memory will not likely work.

The following is a list of video devices and their respective features:

A2410 Video (Commodore)
  ToolType should be 1024x768.  No other resolutions can be used with
  the emulation.

Amiga Video (Commodore)
  Uses "Planar" graphics (Mac's use "Chunky," so there is a good deal
  of conversion involved).  A 256K lookup table is available for
  speeding up the conversion (7% to 27% increase in speed).

  ECS Video in both NTSC and PAL modes.  Use this driver if you use an
  Amiga 500, 600, 1000, 2000, 2500, or 3000.

  1/2/4 bit video modes, 640x400 interlaced mode.  704x480 (566 PAL)
  overscan resolution.  (OCS/ECS)

  1/2 bit video, Double NTSC/PAL, Super72, and Productivity available.
  Super72 resolution is 832x624 (set in overscan prefs).  (ECS only)

  AGA Video in both NTSC and PAL modes.  Use this driver if you use an
  Amiga 1200 or 4000.

  1/2/4/8 bit video modes.  Double NTSC/PAL, Super72, and Productivity
  available.  Super72 resolution is 832x624 (set in overscan prefs).

EGS-110/24 (GVP)
  Works on an Amiga 2000 with a GVP accelerator.

  Supports 8 bit video in 640x480, 1024x768, and 1280x1024.  Supports
  24 bit video in 640x480 resolution.

  The video modes should be defined as follows:

```
   "G110:VGA 640x480"
   "G110:SVGA 1024x768"
   "G110:SVGA 1280x1024"
```

EGS Spectrum 28/24 (GVP)
   8/16/24 bit video modes.

   Board features:  Automatic monitor switch.  Zorro II and III auto-
   detect.  Uses EGS libraries.  Workbench emulation and custom Pref
   settings.  Up to 1600x1280 (interlaced) resolution, 800x600 in
   24 bit mode.

   SpectrumVideo/SpectrumQDVideo allows 256 colors in 640x480,
   1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
   640x480.  (Refresh driver.)

   832x624 direct video driver available (mode not available, must be
   created by an expert--Warning: Improper custom modes can destroy
   your monitor, so don't experiment!).
   The screenmode name must be: "LEGSa:VGA 832x624"

Merlin (Spectronics)
   8/16/24 bit video modes.

   Board features:  Built-in monitor switch.  Auto-detect Zorro II and
   III bus selection.  Resolutions up to 1536x1152.  Holds up to
   16 megs RAM.  Includes Y/C and composite video.  Uses HRG libraries.
   Workbench emulator and mode-promotion.

   MerlinVideo/MerlinQDVideo allows 256 colors in 640x480,
   1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
   640x480.  (Refresh driver.)

   Support for up to 1536x1152 (256 colors). (Direct drivers.)

OpalVision (Centaur)
   16/24 bit video modes.

   640x400 maximum resolution (640x512 in PAL mode).

   Requires 2.5 megabytes of free memory for video system to open (that
   is, in addition to whatever you select for the emulation).

   Slow, but works.  (Recommended refresh rate:  20 FPS)

Picasso II (Expert Services)
   8/16/24 bit video modes.

   Board features:  Works with Amiga 2000, 3000, and 4000.  Automatic
   monitor switch.  Workbench emulator and mode-promotion.  Up to
   1600x1200 (interlaced) resolution, 800x600 in 24 bit mode.

   PicassoVideo/PicassoQDVideo allows 256 colors in 640x480,
   1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
   640x480.  (Refresh driver.)

   Supports up to 1600x1200 resolution (direct driver).

    Direct drivers are not fully compatible with other Picasso screens.
    You may see trash in the screens.

Piccolo (DKB)
    16/24 bit video modes.

    Board features:  Zorro II and III auto-detect.  Uses EGS libraries.

    PiccoloVideo/PiccoloQDVideo allows 256 colors in 640x480,
    1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
    640x480.  (Refresh driver.)

    Screenmode names are as follows:
    "PICOa:VGA 640x480"
    "PICOa:VGA 1024x768"
    "PICOa:VGA 1280x1024"

    832x624 direct video driver available (mode not available, must be
    created by an expert--Warning: Improper custom modes can destroy
    your monitor, so don't experiment!).
    The screenmode name must be: "PICOa:VGA 832x624"

Rainbow II
    Only supports 768x536, 24 bit.

    Does not display "Welcome to Mac..." message when starting up.

Rainbow III
    Works on Amiga 3000 and 4000.

    8/15/24 bit video modes in 640x480 resolution.
    The video mode is defined as follows:  "RB3a:VGA 640x480"

    1024x768 in 24 bit video mode available.

Retina (MacroSystemUS)
    8/24 bit video modes.

    Board features:  Workbench emulator and mode promotion.  Up to
    2400x1200 (interlaced) resolution, 1152x862 in 24 bit mode.

    RetinaVideo/RetinaQDVideo allows 256 colors in 640x480,
    1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
    640x480.  (Refresh driver.)

    68040 Amiga's are required to use the "Init_Retina" program before
    running the emulation with this driver (if you don't already use the
    Workbench emulator).

Retina Z3 (MacroSystemUS)
    Works on Amiga 3000 or 4000 (Zorro III).

    RetinaZ3Video/RetinaZ3QDVideo allows 256 colors in 640x480,
    1024x768, or 1280x1024.  Also allows 32768 or 16M colors in
    640x480.  (Refresh driver.)

Supports up to 1600x1200 resolution (direct driver).

68040 Amiga's are required to use the "Init_Retina" program before
running the emulation with this driver (if you don't already use the
Workbench emulator).

Visiona Paint (Vionna Development GMbH)
  8/24 bit video modes, 640x480 resolution.

  Board features:  Available in 85 to 135 MHz versions.

Vivid 24 (DMI)
  24 bit mode video, 1024x768 resolution mode available (refresh
  driver).

  Board features:  Works on Amiga 3000 and 4000.  Up to 2048x2048
  (interlaced).  32 or 40 MHz.  Expandable up to 8 megs of DRAM,
  16 megs of VRAM, and up to 4 math coprocessors.

Boards currently not supported:

  Black Box (DJW Microsystems)
  Firecracker 24 (Impulse, Inc.)
  DCTV (Digital Creations)
  Harlequin (ACS)
  IV-24 (GVP) *
  Resolver (DMI) *
  Talon (DKB) **
  Video Toaster 4000 (NewTek) ***


*      Due to their slow refresh rates, these boards will not be supported.
**     Talon has not been released at the time of this writing.
***    The Video Toaster is not a video card, so it is not capable of producing
       video compatible with the MAC emulation.


## 1.44  Glossary


                                   Glossary

                                      A

  active window:  This is the window with which the user interacts.
Its title bar is highlighted--by color on the Amiga, by lines on the Mac.

  ASC:  Apple Sound Chip.  Hardware that Apple computers use for
producing audio.  4 Channel stereo/mono sound.

  ADB:  Apple Desktop Bus.  Hardware that Apple computers use for
user-input devices--such as the keyboard, the mouse, and graphic tablets.

  addressing:  24- or 32-bit.  This is a feature of memory on the Mac
which allows it to operate more efficiently and use larger amounts of memory
(in 32-bit mode).

alert:  A warning which the system gives.  It appears in a box and usually allows the user to choose between one of two actions.

AMIA:  Amiga Macintosh Interface Adapter.  An adapter which allows the user to read and write Mac 800K (low density) format disks.

AppleTalk:  An Apple computer network device--allowing various computers to interact.

application:  A program that works with one specific purpose, such as record keeping or graphics.

assignment:  A name that programs can use instead of needing to search for a directory.  For example:  "FONTS:" instead of "DH3:Fonts/"

B

backup:  A copy of files.  If files are lost or get corrupted, the backup can replace them.

baud:  Speed at which communication devices operate.  Derived from the term "bits per second."

bit:  A binary digit (i.e., 0 or 1).

boot:  Start the system by reading initial information off a storage device, such as a floppy disk or hard drive.

bridgeboard:  An expansion board that emulates a PC with hardware.

buffer:  Memory used for storing information so that the program can continue while the system waits for whatever uses the information.  A device buffer, for example, allows the emulation to continue working while the device handler waits for the device to transfer the information.

bug:  A term which refers to a small problem--usually a mistake or an omission.

bus:  Circuitry that connects one part of the computer to another.

"busy" drive:  State in which a drive is "locked" and cannot be accessed by programs which do not hold the lock.  The Mac emulation will lock the floppy drives in this state if you select Mac control of the floppy drives.

busy loop:  A programming technique that causes the CPU to be busy doing nothing until a set duration has passed.

byte:  One unit of information ranging from -128 to 127, consisting of eight bits.  Often used in multiples to form larger values or strings of information.  For example, a long word consists of four bytes and has a combined range of -2,147,483,648 to 2,147,483,647.

For ease, larger units are referred to by their approximate size:

kilobyte (K):  1,024 bytes
megabyte (M):  1,024 x 1,024 bytes

gigabyte (G):  1,024 x 1,024 x 1,024 bytes

C

   cache:  Memory that is specfically designated for buffering
purposes. See buffer.

   checksum:  A value which represents the "sum" of a file's entire
data.  This is used to verify that the file has not been corrupted.

   chip:  Integrated circuit.  A small electronic circuit designed to
produce specific data, or to convert data into a usable form.

   chunk:  A set of data whose parts reside next to each other,
allowing programs to assume simple (fast) routines for referring to it.
See fragment.

   clipboard:  Memory that is used for holding information which the
user cuts, copies, or pastes.

   code:  General term for a program--as opposed to data or
information.  This term also refers to the way a device communicates with a
program.

   compatibility:  The degree to which the emulation meets a program's
expectations.  In many ways, the Mac emulator succeeds.

   compression:  A method for storing redundant or simple data in a
complex fashion, allowing it to be made smaller.  See decompression.

   configuration:  The settings that tell the program how to prepare
itself for your use.

   controller:  A circuit which decides how a device is used.  For
example, a hard drive controller decides how to store and retrieve its data.

   CopyBack:  A processor mode which takes advantage of specially
structured programs, allowing them to run a lot faster than normal.

   CPU:  Central Processing Unit.  The main integrated circuit that
programs use to control the computer.

   crash:  This is when the system or a device has a very serious
problem and often needs to be restarted or repaired in order to fix the
problem.  See boot.

D

   decompression:  Method for reproducing information from very
complex data.  See compression.

   default:  The settings a program uses unless it is told to do
otherwise.  See configuration.

   desktop:  The Mac equivalent of Workbench--the environment on which
the user opens windows and shows program icons.  Unlike Workbench, however,
desktop is a reference to an aspect of Finder (Mac's DOS).  See Finder.

disk:  A special surface contained in a plastic shell on which
information can be recorded magnetically.  Optical disks use lasers to read
and write optical information.

  DMA:  Direct Memory Access.  A design that allows devices or special
coprocessors to read or write into memory without disturbing other
processors (i.e., the CPU).

  DOS:  Disk Operating System.  A system program which includes a file
system and a method of interpreting and executing particular files.  See
file system.

  DOSDriver:  Device driver that adds more control, giving DOS more
ways to store or retrieve files.

  double-click:  Quickly pressing the (left) mouse button twice.

  drag:  Holding down the mouse button while moving the mouse.

  drawer:  A subdivision of a file storage area--a DOS subdirectory.
Drawers allow you to organize data better, particularly on large storage
devices like hard drives.  See folder.

  drive:  A device that stores and retrieves information from disks.

  driver:  A system program that directs the control of data to and
from a specific part of the computer or a particular device.

  dump:  Term for storing binary data directly to a file, usually from
a chunk of data.  See chunk.

                                    E

  eject:  Remove a disk from the drive (with the eject button).

  EMPLANT:  Electronic Micro-Processor Level Amiga Native Task.
Special hardware designed to facilitate any type of emulation.

  emulation:  A system that translates the functions of a different
computer into ones the user's computer understands, letting programs
intended for the other computer to operate on the user's.

  expansion:  Hardware designed to add memory and/or functionality
to your computer.

  extension:  Mac equivalent of a driver.  This adds to the
capabilities of the system and the desktop.  Also called Init.

                                    F

  file system:  Software that controls how data is organized, passing
the information along to the user or driver; often a substitute for or a
part of DOS.  See DOS.

  Finder:  Mac system software that controls files and the desktop.

floppy:  Disk created with a flexible plastic.  See disk.

folder:  Mac equivalent of a drawer.  A subdirectory in which the
user can place files and organize data.  See drawer.

format:  The way sectors are arranged on a disk in preparation for
use by a Disk operating system.  See DOS.

FPS:  Frames per second.  See refresh.

fragment:  A group of data which represents part of a set.  To
fragment means to cause data to be scattered over a storage region.  To
defragment means to arrange the data so that all the parts follow each other
sequentially.  See chunk.

G

gadget:  An image that represents a specific function of a program.
Often used to answer a question that the program asks.

gigabyte:  1,024 megabytes.  Often abbreviated as "gig."

H

hang:  To repeat a useless program step endlessly.  Often caused by
improper programming techniques.  Warning:  A program that hangs may leave
trashed data!  Always save whatever you can if a program hangs, then restart
the system.

hard drive:  A high-speed, large capacity drive with disks that are
not generally removed.  See drive.

HardFile:  A large file which, via special handling, appears to DOS
to be a hard drive.

headers:  Information at the beginning of a file that tells the
system or a program how to handle the file--usually indicating the contents
of the file.

I

I/O:  Input/Output.  Term for data, or the process of transferring
data.

icon:  An image which represents an item on Workbench or desktop.

iconify:  Reduce control of a program to an image which, when
activated, will return control of the program to normal.

ID:  Identification.  A value that represents a specific device to a
controller or a specific type of file to a FileSystem.

installation:  A process whereby program files are stored and
configured for a user's specific system.

installer:  A program that unifies the process of installion
between one program and another.  The Amiga's installer works the same way

for any given program, but is flexible enough for most installation
procedures.

  interface:  The method used to communicate with the program.  This
term often refers to the way devices communicate with the computer, but it
can also mean the way a user communicates with the computer.

  interrupt:  A signal to the CPU from the hardware that an event has
occurred which may require processing.

  Intuition:  The Amiga's system program which controls most
communications between the user and programs.

K

  kilobyte:  1,024 bytes.  Often abbreviated as "K."  See byte.

M

  Mac:  Short for Macintosh.

  megabyte:  1,024 kilobytes.  Often abbreviated as "meg."

  MMU:  Memory Management Unit.  Special part of some CPU's that allow
extended software control of the computer's memory.

  monitor:  A device that can display video images.

  MountList:  A list of drivers and specifications of their respective
drives.  See DOSDriver.

  multitask:  A method of allowing more than one task to run within a
short period of time.

O

  optimize:  Defragment.  See fragment.  Also refers to a process
wherein unnecessary steps are removed from a procedure or a program.

  OS:  Operating System.  The combined package of system software,
controlling all the aspects of the computer's system.

P

  parallel port:  An interface which sends data 8 bits at a time.
See serial port.

  partition:  A section of a hard drive which is treated by the system
like a separate hard drive.

  patch:  Special code and/or data designed to fix a problem with the
original code.

  PD:  Public Domain.  Software not intended for sale or trade.

  peripherals:  Devices which are usually connected to the computer
and controlled by the computer's system.

platform:  A complete set of hardware and software rules which
govern how the system software operates.  See OS.

priority:  The level at which a task would need to be in order to
pre-empt your task.  In general, higher priority tasks can pre-empt lower
priority tasks, causing the lower tasks to go slower or even come to a
complete stop, briefly.

process:  (run by DOS) Refers to a special task which can
communicate with DOS.

processor, See CPU.

<div align="center">R</div>

RAM:  Random Access Memory.  Temporary, fast storage that programs
use for processing information.

reboot:  This clears most of the memory and returns the computer to
a state much like when it powered up.

refresh:  A method by which data is restored or changed.  This term
usually refers to the video image information.

requester:  A small window that usually appears within its
respective window, which contains information for the user and usually waits
for a response from the user.

Restart:  Mac equivalent of a reboot.  Clears memory and returns the
computer to an initial state.  In the case of the emulation, however, only
the Mac emulation is affected.  The Amiga is still in the exact same state
as before.

ROM:  Read-Only Memory.  Chips that contain unchangeable information
--usually in the form of code.  See code.

<div align="center">S</div>

scroll:  Document or figure which only partially appears in a
window, allowing you to move the window in respect to the image--which
usually means moving the data in the reverse direction and leaving the
window in the same place.

SCSI:  Small Computer System Interface.  (Usually pronounced
"Scuzzy.")  A system by which devices can communicate with the computer.

serial port:  An interface that sends 1 bit at a time to a device.
See parallel port.

ShutDown:  The Mac equivalent of turning the power off.

storage:  A method by which information can be retained for future
use.

supervisor:  A special CPU mode that allows any instructions to be
executed.

   SYBIL:  A special pair of hardware adaptors that can be used to
control the rate at which a floppy drive spins a disk.

   system:  The software which governs how most programs operate on any
given computer.

                                    T

   task:  A single program which usually serves one purpose.

   transfer:  Input/output.  See I/O.

   trash:  A special icon where you can drag other icons to dispose of
them.  For Macs, device icons dropped over this icon are ejected, as well.

                                   V,Z

   volume:  Refers to a device or a name given to a specific directory
where files may be retrieved or stored.

   Zorro:  Refers to the type of expansion slots used on the Amiga.


## 1.45  index

                                  Index

                                    6

68040 Compatibility

                                    A

A2410 Video
ADB, mouse and keyboard
Address, EMPLANT Board
AGA Video
AMIA, Selection
Amiga Video
Amiga side, how to go to
AppleTalk, Port A
AppleTalk, Port B
Audio Digitizer
Auto-Boot socket
Auto-Logic version

                                    B

Backup, Software
Backups, Making
Boot order

                                    C

Cache Control

```
  Not Enough Memory For Device Transfer Buffer!
  OS Error! – Can't Open Any Screens!
  Problem – Unable to Start Emulation Process!
  ROM Image corrupted – Invalid Checksum!
  ROM Image File Not Found!
  ROM Image Not Mirrored – MMU Failure!
  ROM Image Not Selected or Incompatible!
  Serious Problem – Unable to Setup External IO Driver!
  Serious Problem – Unable to Start Video Process!
  Soft/HardKickMMU Not Active!  Use Soft/HardLaunch!
  This EMPLANT emulation module requires a 68020+ CPU
  Too much MAC System memory selected!
  Unable to Allocate any 16 bit Memory!
  Unable to Allocate NUBUS Memory!
  Unable to Allocate ROM Image Memory!
  Unable to Allocate SYSTEM Memory – Reduce SYSTEM Size
  Unable to Allocate VIDEO Memory!
  Unable to Initialize the Audio Hardware!
  Unable to Initialize the Video Hardware!
  Unable to Open 'amia.device'!
  Unable to Open 'clipboard.device'!
  Unable to Open 'multi-os.device'!
  Unable to Open AmigaDOS Device!
  Unable to Open Parallel Device Driver!
  Unable to Open Serial Device Driver!
  Video Driver File Not Found!
```

```
HardLaunch_MAC
Hardware Info
```

```
                                    I
```

```
Illustrations
Installation, Software
Introduction
Introduction, Emulation Requirements
Introduction, Obtaining a ROM Image
Introduction, Software Backup
Introduction, Software Installation
```

```
                                    K
```

```
Keyboard, Overview
Keys, Amiga system
Keys, Clipboard
Keys, Command
Keys, Floppy Format
Keys, Function
Keys, Option
Keys, Special combinations
Kickstart, version required
```

```
                                    L
```

```
Launching the Emulation
Launching, EC_Launch_MAC
Launching, HardLaunch_24
Launching, HardLaunch_MAC
Launching, SoftLaunch_24
Launching, SoftLaunch_MAC
Legalities & Warranty Information
Licensed Software, Use of
```

```
                                    M
```

```
MAC_HDSetup
MAC_HDSetup, Mounting the Device
Macintosh Sound
Macintosh system disk
Macintosh system, Using
Mass Storage
Memory Options
Memory configurations (24 bit mode)
Memory function, NuBus
Memory function, ROM
Memory function, System
Memory function, Video
Memory type, 16-bit
Memory type, 32-bit
Memory type, Chip
Memory type, Ranger
Memory, amount required
Merlin
Misc I/O Control
```

## 1.46  Illustrations

                         Illustrations

  Mac Keyboard
  Main Setup Screen
  Figure 1-1     (Memory Configuration)
  Figure 2-1     (Video Driver Configuration)
  Figure 2-2     (Video Driver Information)
  Figure 3-1     (Floppy Disk Configuration)
  Figure 4-1     (Mass Storage Configuration)
  Figure 5-1     (ROM Image Configuration)
  Figure 6-1     (Port A Configuration)
  Figure 7-1     (Port B Configuration)
  Figure 8-1     (AmigaDOS Device Configuration)
  Figure 8-2     (Device Information)