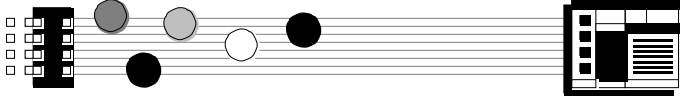

MacEnvy 2.1

Release Notes

& Reference Guide

12 February 1990



Written by Ken McLeod

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• About this document

This document was created and formatted with “classic” MacWrite, for compatibility with other Macintosh word processors. For best results, you should have the *Times* and *Courier* fonts installed in your System file (or otherwise available.)

Changes since version 2.0:

- 1) The “Monitors” item would report “1 screen device” when multiple monitors were present. Should be fixed now.
- 2) Locations east of GMT were displayed incorrectly, since the high byte of gmtDelta wasn’t being stripped. Fixed.
- 3) The standard file “Save” dialog was displayed in a fixed location relative to the Control Panel window, and would sometimes end up partly off the screen if the Control Panel window was near the screen’s edge. The Save dialog is now pinned to the desktop GrayRgn’s bounding rectangle.
- 4) Finder and MultiFinder version numbers were displayed incorrectly or not at all with some non-U.S. system configurations. Fixed.
- 5) The “Debugger” item didn’t work at all (the message “Installed at [address]” was misleading.) MacEnvy now detects whether TMON or Macsbug is installed, and displays an appropriate string.
- 6) The goAway box is now hidden when Life is activated, since its presence was inappropriate in the Life context.
- 7) The test for 32-Bit Quickdraw has been changed from trap \$AB1D to trap \$AB03. While the former still “works” as a test (in current systems), the latter is recommended in the 32-Bit Quickdraw documentation.
- 8) Macintosh Plus ROM revision identifiers have been changed from [A,B,C...] to [1,2,3...] in order to maintain consistency with other ROM revision identifiers.

9) The “Boot Drive” item has been changed to “Startup Dev”. On machines with the Start Manager, if a valid Startup Device has been specified (via the Startup Device cdev), that device is displayed as the “boot drive.” If the Start Manager is not present, or if no valid Startup Device is specified, the default floppy drive is displayed as before.

10) All 6 possible NuBus slots are now displayed. This necessitated removal of the monitor “Resolution” items, which wasn’t too great a loss, since the 72 pixels-per-inch value returned by ScreenRes did not always reflect the true hardware resolution.

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Introduction

The Macintosh today is a far cry from being the little beige appliance its creators envisioned. There are now practically endless options for upgrading your Mac, whether it be a lowly 128/512K or a high-end IIfx, to give it some new functionality. With the large number of RAM upgrades, motherboard swaps, internal hard drives, ROM revisions, external monitors, plug-in chips, cards, and connectors out there, it can be difficult to tell “what's in the box” without physically opening the Mac and looking inside!

MacEnvy was created, in short, to show you exactly What's In The Box. (The name is both an abbreviation for your Mac's Environment, and the way others might feel about it!) *MacEnvy* provides a concise display of all the major hardware features of your machine, along with information about your software environment, in one easily accessible place: the Control Panel. Need to know if you've got the “new” clock chip in your 512KE? Are you wondering if there's a 68851 PMMU in that Mac II? Can't remember when you last backed up your hard disk? Not sure if that SE really came with a SuperDrive? *MacEnvy* will tell you all this, and much more.

User's Guide

Installing MacEnvy

Place *MacEnvy* in your System Folder. That's all there is to it; rebooting is not necessary. Since *MacEnvy* is a Control Panel Device, it requires the modular Control Panel that comes with System 4.1 and later. If you have an older version of the System, you'll need to update it in order to use *MacEnvy*.

Using MacEnvy

To use *MacEnvy*, select the Control Panel desk accessory from the Apple menu, then click the *MacEnvy* icon in the Control Panel's scrolling list. After a brief wait for the system information to be collected, you'll see a screen remarkably similar to the one in **Figure 1** (certain items may be different, of course!):

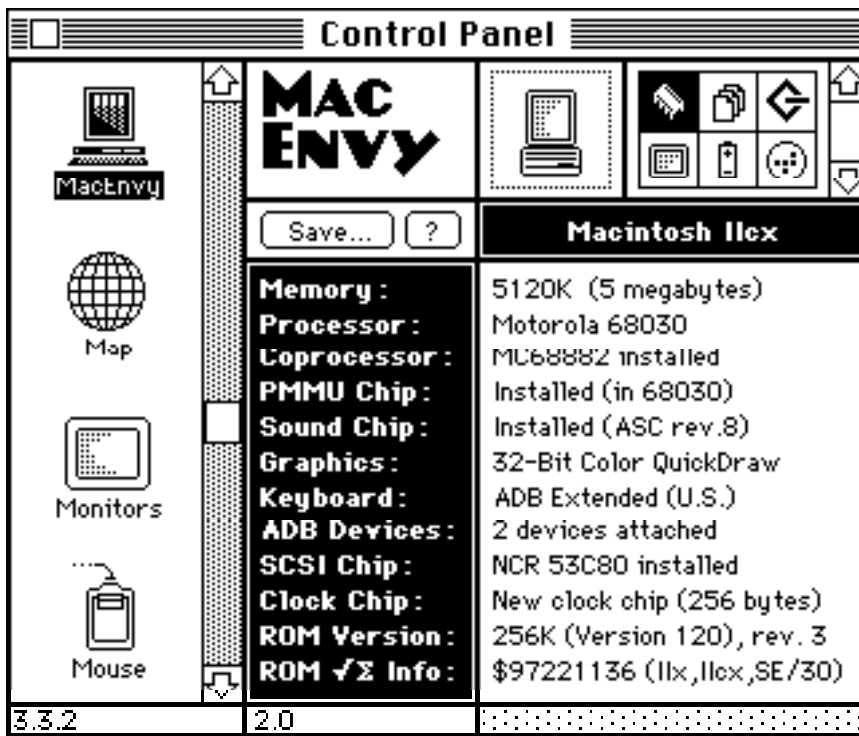


Figure 1. Sample MacEnvy screen

MacEnvy organizes your system information on separate **pages**. Each page has a corresponding icon in the modular **page palette** at the top right corner of the window. The first page, which contains hardware-related information, is selected automatically when you open the cdev.

To view another page, simply click on an icon in the page palette. You can use the arrow (cursor) keys to quickly flip between pages.

Just to the left of the page palette is a somewhat larger **machine icon**, which provides a graphic representation of your Macintosh model. Clicking this icon currently serves no useful purpose, but you may have fun doing it anyway.

The **model name** is displayed directly below the machine icon and page palette. If your Macintosh model is not recognized by this version of MacEnvy, you'll see a generic **machine number** in place of the name. Refer to "Machine Types" in the Reference section of this document for a list of known models and their numbers.

Saving A Report File

MacEnvy now features the ability to save a complete "report" on your system configuration. This report is a standard TEXT file, so it can be opened and printed by most word processors. To save a report file, click the **Save...** button. The standard file dialog will appear, prompting you to name the file and specify the folder in which to save it (see **Figure 2**).

Advanced users can edit MacEnvy's STR# ID=1100 resource to change the report file Type and Creator, as well as the default filename string and prompt.

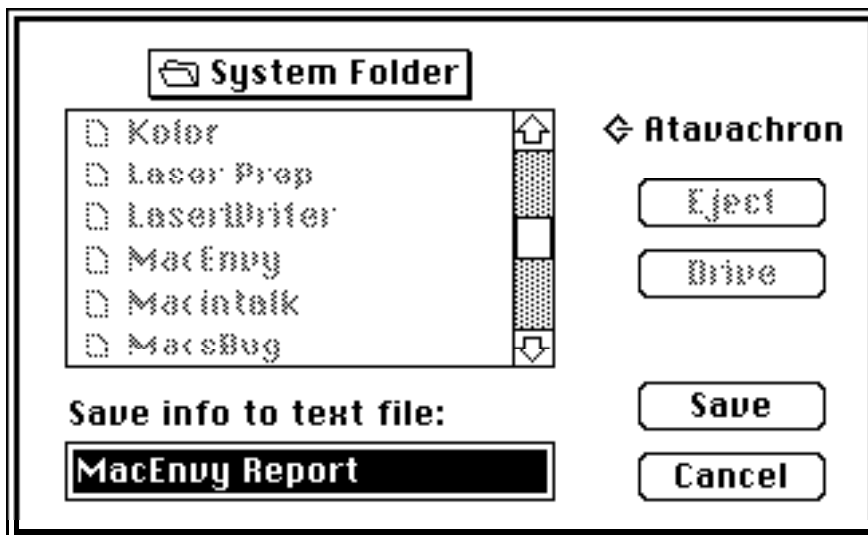


Figure 2. Saving a MacEnvy Report file

This report file can be useful in helping technical support personnel, network managers, computer lab administrators, and others to quickly assess a particular machine's configuration, and to evaluate differences between machines.

Features, Not Bugs!

Much of the text that MacEnvy displays is now stored in resources. This means that titles can be easily changed, or translated to another language. Unfortunately, MacEnvy is not yet fully "Script Manager compatible," since it currently relies on the assumption that a character is represented by one byte. Also, in order to save space, it's assumed that items which display a numeric count of devices should have an "s" appended to the device name if the number is not equal to 1 (i.e. "1 SCSI drive," "2 SCSI drives"). Obviously, this may not be a valid assumption for languages other than English.

Another feature of this version is the fact that it's twice the size of MacEnvy 1.0. (Twice as nice, too.) However, all of MacEnvy's code must be able to fit in memory at once. This requires approximately 32K of RAM. In situations where this amount of free memory is at a premium, the Control Panel may not be able to load MacEnvy. The next major version of MacEnvy will be restructured into several smaller modules, which can be loaded individually when needed, to avoid this problem.

The Main Event

The remainder of this document is a reference guide, which explains each category of information in detail. Many of the descriptions tend to be somewhat technical, but hopefully will shed light even if you're not a programmer.

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Reference Guide



Hardware Information

Machine Type: The name of this Macintosh model, or machine number if the name is unknown. MacEnvy currently recognizes the following machines (the numbers are defined by Apple):

<u>Model</u>	<u>Machine Number</u>
Macintosh XL (Lisa)	-2
Macintosh (128K or 512K)	-1
Macintosh (undefined type)	0
Macintosh 512e (Enhanced)	1
Macintosh Plus	2
Macintosh SE	3
Macintosh II	4
Macintosh IIX	5
Macintosh IICx	6
Macintosh SE/30	7
Macintosh Portable	8
Macintosh IICi	9

Memory: The total amount of RAM (Random Access Memory) installed in your Macintosh. This is given in 'K' (kilobytes) as well as 'M' (megabytes). Some of the more common memory configurations are 1024K (1 megabyte), 2560K (2.5 megabytes), 4096K (4 megabytes), 5120K (5 megabytes), and 8192K (8 megabytes). Other configurations are possible.

Processor: The type of main processing chip (sometimes called the CPU) installed on the logic board in your Mac. This is determined by calling the `_SysEnvirons` trap, which in turn reads the information from the low-memory global variable `CPUFlag` (a byte at \$12F). Processor types currently recognized are the Motorola 68000, 68010, 68020, 68030, and 68040. In most instances, additional processors on third-party accelerator cards aren't recognized by the System (and therefore go unrecognized by MacEnvy); usually, an INIT is required to install special code that routes instructions to these chips. It may be possible to recognize some or all of the potential processors eventually, but MacEnvy currently assumes that the processor indicated by `CPUFlag` is valid.

Coprocessor: The type of floating-point coprocessor chip (sometimes called an FPU) installed, if any. The existence of an FPU is first determined by `_SysEnvirons`. If 'hasFPU' is true, then an `FSAVE` instruction is executed, and the size of the generated stack frame is compared to known values for the 68881 and 68882 chips. "Unknown FPU installed" is displayed if some other type of FPU is present.

PMMU Chip: The type of Paged Memory Management Unit (PMMU, or just MMU) present, if any. The 68020-based Macintosh II initially comes with an "HMMU" chip installed (the "H" supposedly stands for its designer, Hochsprung, although this depends on whom you talk to!); however, this chip does not support virtual memory "page swapping," and must be replaced with a 68851 PMMU if virtual memory capability is needed. Macintosh models with 68030 and later processors have no need of a PMMU, since the MMU is built into the processor. Older 68000 processors do not support any kind of MMU. There are currently 3 possible cases: the machine has no MMU at all; the machine has a 68020 + 68851 processor/MMU combination, or the machine has a 68030 or later processor (with integral MMU).

Sound Chip: Whether or not the Apple Sound Chip (ASC) is present. The ASC is a custom chip that reduces the processor load associated with creating sounds, as well as providing features such as stereo sound capability. There is currently no supported method for determining the presence of the ASC, although future revisions of `_SysEnvirons` and/or "Gestalt" are rumored to provide this info. MacEnvy examines `ASCBASE` at \$CC0 to determine where the ASC is mapped in addressable space, then compares this address to a set of known values for existing machines and ASC revisions (up to and including the Macintosh IICi.)

Graphics: The maximum set of graphics routines that is present on your Macintosh. This is not necessarily the graphics model currently in use! MacEnvy recognizes 3 different types: Standard (or “Classic”) QuickDraw, Color QuickDraw, and 32-Bit Color QuickDraw. If `_SysEnvirons` returns true in 'hasColorQD', MacEnvy tests for the presence of `_QD32` (toolbox trap \$AB03); if it's implemented, 32-Bit Color QuickDraw is present.

Keyboard: The type of keyboard attached to your machine (if more than one, the type of keyboard last used), as determined by the value of the global variable `kbdType` at \$21E. MacEnvy uses the value returned by `_SysEnvirons` if it can; when this value is unknown or undefined, as happens with some combinations of keyboards, keypads, and other input devices, MacEnvy tries to match `kbdType` with a list of empirically derived values. As a last resort, the value of `kbdType` itself is displayed. Finally, MacEnvy determines whether the keyboard is a U.S. model by testing the value of the ASCII character code mapped to the space key (keycode \$31 → ASCII \$20.) This test is still “preliminary”; a test to distinguish between non-U.S. keyboards has yet to be implemented.

ADB Devices: The number of Apple Desktop Bus (ADB) devices attached to your Mac. If bit 10 of the word at \$B22 (`hwCfgFlags`) is set, ADB is present; `_CountADBs` is then called to count the number of entries in the ADB device table. For most ADB-equipped Macs, there are usually at least 2 devices: the keyboard and mouse.

SCSI Chip: The type of SCSI chip installed. If your machine has no SCSI port, it's a safe bet that it won't have a SCSI chip, and vice-versa, so this item also serves to tell you whether a SCSI port is installed. The high bit of `hwCfgFlags` (a.k.a. `SCSIFlag`), if set, indicates that SCSI is present. MacEnvy currently doesn't attempt (or know how) to directly determine the type of SCSI chip; instead, it displays the chip type as “NCR 5380” on SCSI-equipped machines prior to the IIX, and “NCR 53C80” on the IIX and later machines (at least until I find a better way!). The 53C80 is an improved version of the 5380, with increased SCSI performance.

Clock Chip: The size and type of clock chip (often referred to as Parameter RAM, or just PRAM) installed. The clock chip contains a small amount of RAM which is maintained by your Mac's battery when the machine is powered down. This RAM is used to keep track of the current date, time, and other user-configurable settings. With the advent of the Macintosh Plus, a “new” custom chip was introduced which stored 256 bytes of PRAM (the “old” chip stored 20 bytes.) Some 512K machines which were shipped just prior to the introduction of the Plus contain the new clock chip as well. Various features of System 6.0 and later require the extended PRAM to be present (the “Map” cdev is a notable example). MacEnvy checks `hwCfgFlags` yet again (bit 13 this time) to determine whether “XPRAM” is present. (IMPORTANT: the test for the clock chip is actually a test for the presence of its *functionality* (the 256 bytes of parameter RAM.) It's possible to have both the “old” 20-byte chip *and* extended PRAM if Scott Armitage's “512KE XPRAM INIT” has been installed. In this situation, MacEnvy correctly reports that 256 bytes of PRAM are present, but incorrectly reports “new clock chip.” If there's any doubt about whether your 512KE machine has the new chip, make sure this INIT is not present in your System Folder when you run MacEnvy.)

ROM Version: The size, version, and revision level of the ROM (Read-Only Memory) in your Macintosh. The version number is contained in the low byte of the word at an offset of 8 bytes from the start of ROM. Finding the revision level is not as straightforward, since it can only be inferred from the ROM's unique checksum. The following table lists all the ROM revisions that MacEnvy currently knows about (naturally, there may be others!).

Version Number	Revision Level	Checksum	Size	Machine
105 (\$69)	1 (<i>the “old ROMs”</i>)	not known	64K	128K, 512K
112 (\$70)	1 (MacWorks XL ROM image)	not known	64K	Macintosh XL
117 (\$75)	1 (“Lonely Hearts”)	\$4D1EEEE1	128K	Mac Plus, 512e
	X (“Lonely Hearse”)	\$4D1EF4E1	128K	Mac Plus, 512e
	2 (“Lonely Heifer”)	\$4D1EEAE1	128K	Mac Plus, 512e
	3 (“Loud Harmonica”)	\$4D1F8172	128K	Mac Plus, 512e
118 (\$76)	1 (original SE ROM, no CQD)		\$B2E362A8	256K
Macintosh SE				
120 (\$78)	1 (original Mac II ROM)	\$97851DB6	256K	Macintosh II
	2 (Slot Manager bug fix)	\$9779D2C4	256K	Macintosh II
	3 (support for FDHD, etc.)	\$97221136	256K	Mac IIX, IICx, SE/30
122 (\$7A)	1 (original Portable ROM)	\$96CA3846	256K	Macintosh Portable
124 (\$7C)	1 (first “32-bit clean”)	\$368CADFE	512K	Macintosh IICi

The names given to the various revisions of the 128K ROM are perhaps a tad strange, but there's a method in their apparent madness: each describes the particular component of ROM that was changed (i.e. Low ROM, or High ROM). See Macintosh Technical Note #139 for the bizarre details. “Lonely Hearse” is rare and not officially acknowledged, since it was an intermediate set between the original and “Lonely Heifer” ROMs (which fixed the infamous SCSI driver boot bug.)

ROM $\sqrt{\Sigma}$ Info: The unique checksum ($\sqrt{}$ = check, Σ = sum (sigma)... clever abbreviation, eh?) that identifies the particular revision of ROM in your Macintosh. This checksum is found in the first 4 bytes of every ROM, starting at the address contained in the low-memory global variable `ROMBase` (`$2AE`).

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Software Information

System: The version number of the currently active System file, as returned by `_SysEnvirons`. Following the version number, the actual size of this file is displayed in kilobytes. This size can get to be enormous if you've installed many fonts and desk accessories into the System!

Finder: The version number of the Finder file that exists in the same directory as the currently active System file. MacEnvy extracts this number from the string found either in 'MACS' ID=0 or 'FNDR' ID=0 if a 'vers' ID=1 resource is not present.

MultiFinder: The version number and status (active or inactive) of the MultiFinder file that exists in the same directory as the currently active System file. MacEnvy checks to see whether or not `_MFDispatch` (trap `$A88F`) is implemented in order to determine if MultiFinder is active.

Localized For: The country for which the currently active System has been configured. This is determined by examining the high byte of the `intl0Vers` field in `INTL` resource ID=0, as documented in Inside Macintosh I-499.

File System: The currently active file system. There are presently three “known” file systems: MFS (Macintosh File System), HFS (Hierarchical File System), and A/UX (Apple's UNIX implementation.)

Debugger: The name of a low-level debugger, if one has been installed. MacEnvy currently recognizes the presence of Macsbug and TMON; if neither is loaded, “No debugger installed” is displayed. This is determined by examining low-memory locations `$FC` and `$120` (MacJmp) for valid pointers to TMON's and Macsbug's code, respectively. A test for other low-level debuggers is yet to be implemented.

RAM Cache: The size and status of the user-defined RAM cache, which is set via the General cdev. This info is contained in the upper 9 “reserved” bits of the 'misc' field in the `SysParmType` record. If bit 7 is set, the cache is enabled. The high byte of 'misc', when multiplied by 32, gives the size of the cache.

Current App: The name of the currently active application. Technically, this is the name of the current “shell” in which the Control Panel and MacEnvy are running. If MultiFinder is active, this will usually be the “DA Handler,” unless the option key was pressed when the Control Panel was selected from the Apple menu.

User Name: Sometimes called the Chooser Name, this is the name set by the user in the “Chooser” desk accessory (primarily to let other users on a network know who's hogging the LaserWriter.) This name is stored as a 'STR' resource (ID=-16096) in the System file. If the name is blank, MacEnvy displays the string “(not specified).” If the resource doesn't exist (which may happen if the System has been freshly installed, and no Chooser device has been selected), the string “info not available” is shown.

Printing To: The name of the currently chosen printer (actually, the name of the printer driver; also called a “Chooser Device.”) If the printer driver is present in the System Folder and contains a 'vers' ID=1 resource, the version number of the driver is displayed as well.

AppleTalk™: The status and version of the AppleTalk driver. The version number is returned by `_SysEnviron`s in the `ATDrvVersNum` field; if a zero is returned, the driver has not been loaded. Note that until the driver is actually used (or explicitly loaded by making AppleTalk active with the Chooser), it won't be in memory; this situation may occur even if AppleTalk is on.

File Server: The number of remote (server) volumes currently mounted. (This item was called "Remote Vols" in some previous incarnations of MacEnvy.) To determine whether a given volume in the drive queue is a remote volume, MacEnvy examines the FSID and driver reference number associated with the queue element (see the paragraph on "Other Drives:" in the next section.) At present, only the drivers for AppleShare™ and TOPS™ volumes are recognized (with reference numbers of -42 and -32, respectively); other server implementations will show up in the "Other Drives:" category.

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Disk Drives & SCSI Devices

SCSI Devices: The ID numbers of all SCSI devices on the bus. There are 8 possible IDs for a SCSI device (though only 0 through 6 are available; ID 7 is reserved for the Macintosh itself.) A filled-in (inverted) box indicates that a device having that ID is present. If your Macintosh does not have SCSI, the string "SCSI not present" is displayed instead.

SCSI Drives: The number of mounted SCSI drives (i.e. hard disks, CD-ROM drives, and other storage devices.) Note that this may be different from the number of SCSI devices above (which can include non-storage peripherals such as scanners and printers.) A SCSI device is assumed to be a drive if its driver creates an entry in the drive queue. The reference number for such a driver is always in the range (-33..-39), where -33 corresponds to SCSI ID 0, and -39 to SCSI ID 6.

Sony Drives: The number and type of floppy disk drives installed. There are a maximum of 3 possible floppy drives (on an SE, which can have 2 internal floppy drives and 1 external.) For each of the 3 possible drive numbers, the type of drive present (if any) is displayed. This type is either 400K, 800K, FDHD (Floppy Drive High Density, a.k.a. "SuperDrive"), or None.

Controller: The type of floppy disk controller chip installed. This is determined by making a `Status` call to the Sony driver with `csCode = 10` (`MFMStatus`). There are two flavors of controller chip: the IWM (Integrated Woz Machine), which only knows about the standard Macintosh GCR (Group Coded Recording) format, and the SWIM (Super Woz Integrated Machine), which knows about both GCR and MFM (Modified Frequency Modulation) formats. MFM is the low-level format used for MS-DOS disks as well as 1.4 MB Macintosh disks. Note that you can't have a FDHD disk drive without: 1) having a SWIM controller chip installed, and 2) a version of ROM capable of supporting it (revision 3 of the 256K ROM, or greater.)

Other Drives: A catch-all category for any disk drives found in the queue which have not been previously recognized as floppy drives, SCSI drives, or remote server volumes. Examples of "other" drives include RAM disks, serial storage devices, certain types of remote volumes, etc. Two specific exceptions are recognized here: the Apple HD 20 serial hard drive, and the new expansion ROM "EDisks" described in Macintosh Technical Note #255.

Boot Volume: The name and formatted capacity of the volume on which the active System folder (in which MacEnvy resides!) is found. This will usually be the same volume which was used to boot the machine.

Volume Use: The amount of storage space used on the boot volume, followed by the amount of free space. Both sizes are given in 'K' (kilobytes). These numbers are the same as those displayed by the Finder in its icon-view modes, give or take 0.5K for round-off error.

Catalog Info: The number of files and folders on the boot volume. Not much else to explain here.

Catalog Size: The amount of space taken up by the invisible catalog file(s) on the boot volume. This is not to be confused with the invisible “Desktop” file, which is created by the Finder. A fixed amount of space for the catalog file (or files) is allocated when the volume is first initialized. As the catalog fills up, another large chunk of disk space is set aside for more entries. If the boot volume is using the HFS file system, there are separate “catalog” and “extents” files (see Inside Macintosh volume IV for a detailed description); under MFS, a single “flat” file catalog is maintained. On hard disks and other high-capacity volumes, the catalog file can occupy well over a megabyte of storage. Note that once disk space is allocated to the catalog file, it can only be recovered by reformatting the volume.

Last Backup: Possibly the single most confusing category of all. The “last backup” date is stored in the volume information block on every Macintosh volume (see Inside Macintosh IV-124, 166-7). Initially, this field contains a zero. Since Macintosh time is measured in seconds since midnight, January 1, 1904, the date effectively becomes 01/01/04. When a floppy disk is duplicated in the Finder, or a hard disk volume is “backed up” with appropriate backup software, the volume’s backup date *should* be modified accordingly. Unfortunately, in practice this isn’t always the case. Many of the hard disk backup programs currently available, including Apple’s own HD Backup, don’t modify the last backup date after backing up a volume! Only a few update this field correctly. If the last backup date is something other than 01/01/04, MacEnvy displays it, along with the difference (in days) between this date and the current date. This will only be meaningful if the current date is correct, of course. If the backup date is 01/01/04, the string “Never backed up” is displayed.

Boot Blocks: The version number of the information stored in the “boot blocks” on the startup volume. The first two sectors of a bootable Macintosh disk are used to store information on how to start up the computer. These blocks contain various parameters that the system uses to start up, such as the name of the system file, the name of the Finder, the first application to run at boot time, the number of open files to allow, etc. Older versions of the boot blocks contained executable code; on new machines, this code is in ROM.

Startup App: The name of the first application to run at startup, as stored in the boot blocks. The default startup application is the Finder; this can be changed with the “Set Startup” command in the Finder’s Special menu. If the volume is configured to start up with MultiFinder, more than one application may also be specified to load automatically; however, MultiFinder itself is always considered the “startup application,” since it’s responsible for launching any subsequent applications.

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Monitors & Slot Devices

Monitors: The number of screen devices (monitors) installed. If Color QuickDraw is present, MacEnvy calls `_GetMainDevice`, then runs through the device list looking for screen devices. If Color QuickDraw is not present, MacEnvy examines the desktop region (through the handle stored in the low-memory global variable `GrayRgn` at \$9EE.) If the desktop region’s bounding rectangle (including the menu bar) is not identical to the screen’s bounding rectangle, a second monitor is assumed to be present.

Main Screen: The dimensions of the main screen (the one with the menu bar), in pixels.

Pixel Depth: The number of bits per pixel, and the current monitor setting (monochrome or color).

Alt Screen: The dimensions of the alternate screen (the one without the menu bar), if a second monitor is attached. If only one monitor is present, the string “N/A” (Not Applicable) is displayed. Due to space considerations, information about additional monitors (if more than two are present) is not displayed. This limitation will be removed eventually.

NuBus Slots: The number of NuBus slots which contain cards (if any). There are 16 possible NuBus slots, numbered 0 through 15; like the SCSI bus, one slot is reserved for the Macintosh itself (ID 0). On current II-class machines, however, only a subset of these slots is physically present — and this subset doesn’t start with slot 1. For example, the Macintosh II and IIfx each have six slots, numbered from 9 to 14. “Slot Manager not present” is displayed on machines without NuBus capability.

Slot [N] Card: The name of the card in each occupied slot, where [N] is the slot number. MacEnvy displays 6 slots (9 through 14, or \$9 through \$E in hexadecimal notation), the maximum number currently available. If a slot is physically present but contains no card, the string “(no card present)” is displayed. If a slot is not physically present, “(not present)” will be displayed.

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Parameter RAM Settings

PRAM Status: The validity status of the clock chip. Whenever data is successfully written to the chip, \$A8 is stored in the first byte. If a hardware problem (i.e. a bad clock chip, or dead battery) prevents the values from being stored, the status byte will be something other than \$A8, and the system will revert to default values for the time, date, and other settings.

Modem Port: The current modem port settings. Baud rate is displayed first, followed by the number of data bits (D=n), stop bits (S=n), and parity (E=even, O=odd, N=none). The baud rate represents the maximum data transmission speed (number of bits per second) used by the Serial Driver; typically, your modem will transmit data at a different rate.

Printer Port: The current printer port settings. Baud rate is displayed first, followed by the number of data bits (D=n), stop bits (S=n), and parity (E=even, O=odd, N=none). Additionally, there may be a bullet character (•) displayed at the end of this line. The bullet indicates that this port is configured as the default connection for a local printer (such as an ImageWriter.) If the printer port is being used for AppleTalk, the modem port becomes the default printer connection.

Startup Dev: The preferred drive (or device) to use for starting up the system. If the Start Manager is present (currently only on the SE and later machines), and a valid startup device has been specified through the “Startup Device” cdev, this device is displayed. The device may be either a SCSI drive or a slot device. If the Start Manager is *not* present, or no device has been specified, the default floppy drive is displayed. Here’s how the startup order works: when the Macintosh is powered up or reset, and a bootable disk is in the default floppy drive, it will be used as the startup disk. If there’s any problem finding or using the disk in the default drive, the system will look for a startup disk in other floppy drives which may be present. Finally, if no bootable floppies are found, the device specified via the Control Panel is used (unless it’s no longer valid, can’t be found, or the Start Manager isn’t present.) If all this fails, then the SCSI bus is searched for a startup device, in descending order from ID 6 to ID 0. After that, the default floppy drive is checked again, and so on.

Default Font: The name of the default application font. This font (typically Geneva) is the one that’s automatically selected in the Font menu of various applications when you first run them.

Speaker Vol: The current speaker volume setting, ranging from 0 (silent) to 7 (loud).

Mouse Setup: The current mouse parameters. Double-click speed is measured in “ticks,” which are 1/60th of a second in duration. If mouse scaling is on, the cursor on the screen moves at a variable rate, depending on how far and how fast you move the mouse. If mouse scaling is off, the cursor will always move the same distance as the mouse does.

Key Repeat: The current keyboard parameters. Repeat rate is the speed at which a character will repeat when you press and hold down a key. Delay before repeat (also called “threshold”) is the initial amount of time that must elapse before the character begins to repeat. These values are displayed in ticks (1 tick = 1/60th of a second).

Blink Rates: The current rate of caret (text insertion point) blinking, and the number of times that menu items will blink when selected. These parameters are set in the Control Panel’s General cdev. The caret blink rate, like the mouse and keyboard rates, is a measure of time; it’s displayed in ticks.

Latitude: The latitude coordinate of your current location, expressed in degrees, minutes, and seconds North or South of the equator. These values are set in the Map cdev (supplied with System 6.0 and greater), and stored in the “extended” portion of parameter RAM. If you’re using a version of the System earlier than 6.0, or have never used Map to set the Current Location, the latitude will be displayed as 0° 0' 0". To get the current location, MacEnvy calls `_ReadXPram` (trap \$A051) directly if it’s available. If `_ReadXPram` isn’t implemented, or returns an error result, the message “Couldn’t read extended PRAM” is displayed. “Extended PRAM not present” is displayed if your machine has the “old” 20-byte clock chip (see the description of the “Clock Chip:” item above.)

Longitude: The longitude coordinate of your current location, expressed in degrees, minutes, and seconds West or East of the prime meridian (which passes through Greenwich, England.) See Latitude above for details and error messages.

Time Zone: The number of hours and minutes your current location is behind (west) or ahead (east) of Greenwich Mean Time. GMT is used as the reference for all other time zones; it’s the time at the Greenwich Observatory in England. See the description of Latitude above for error messages.

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Life

Introduction

Life is a mathematical “game” invented in the 1960’s by John Horton Conway of the University of Cambridge. It’s technically known as a *cellular automaton*. A cellular automaton can be thought of as an infinite grid of cells that evolves over time, measured by the tick of an imaginary clock. At each tick, or cycle, new cells are “born” and old cells “die” in accordance with a set of rules that apply equally to all cells in the grid. When these rules are applied to a random initial configuration of cells, a series of complex and fascinating patterns begins to develop. In theory, with just the right initial configuration of cells, a cellular automaton could keep growing and reproducing indefinitely — in short, emulating “life.” In practice, the automaton eventually becomes stagnant or totally inactive, due to the finite size of the grid and other computational limitations. (For more information about Life, read *Scientific American*, “Computer Recreations,” May, 1985, and February, 1987.)

The Rules

Life’s set of rules is very simple. Each cell may either be alive or dead. The eight squares which surround any given square on the grid are defined as that cell’s *neighborhood*. If a cell is dead, and has exactly three living neighbors, it comes to life; otherwise, it remains dead. If a cell is alive, and has less than two or more than three living neighbors, it dies; otherwise, it remains alive. End of rules.

Implementation

MacEnvy’s non-interactive version of Life is played out on a grid 20 squares wide by 15 squares high. The Life grid “wraps around” — that is, cells on one edge of the “world” are neighbors to those on the opposite edge. When the Life icon is first selected, the world begins with 5 living cells in a fixed pattern, starting at a random location on the grid. This 5-cell pattern is depicted in the icon. As each new generation is calculated, living cells appear as circles, and dead cells are erased. The generation number (iteration counter) is shown at the bottom of the window, along with the current number of living cells. When you’re tired of Life, just click the mouse to return to MacEnvy.

Stages of Life

Newly-born cells are filled with a solid black pattern (red, on a color monitor.) When a cell survives into the next generation, its pattern (or color) changes; after staying alive for 5 generations or more, the cell becomes white (from old age, perhaps.) Press any key while Life is running to toggle between solid and pattern drawing modes. If there has been no change or growth in the world for 10 generations, a “mutation” is introduced to liven up the action, and the generation counter is reset to zero. This “mutation” is simply another randomly-placed group of 5 cells; however, these cells may interact with existing stagnant cells to create new formations that continue to grow for many generations.

Theme and Apotheosis (or “Why is this thing in MacEnvy, anyway?”)

The idea behind the inclusion of Life in MacEnvy is the theme of the “infinite Easter egg,” where a smaller egg continues to turn up nested inside the shell of a larger one. On a Macintosh, the System provides a shell in which application programs are run; the application program in turn is a shell in which desk accessories (like the Control Panel) are run; the Control Panel is a shell in which ‘cdev’s (like MacEnvy) are run, and MacEnvy itself is a shell in which Life runs. The fascination of this model, both as concept and phenomenon, is due to the element of continuity it contains; the series of shells could theoretically carry on indefinitely. Life, as the “program within a program,” suggests a logical sequence whose end cannot be conceived.

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Roll The Credits

Many thanks to the following people who contributed to this project: Jack Kobzeff, Mike Twitty, and Fred Condo, for testing each new version and collecting scads of MacEnvy Reports; Mark Chally, for his helpful “second opinions” on the interface; Joseph Buchanan, for the FDHD documentation; J. Hamilton, for the FPU test code; Michael Forselius, for the TMON test code; Mike Jewett, for keeping the store open late one night so I could hack on the Ici; Jason Levitt, without whose constant enthusiasm version 2.0 might not have been released in this decade; and finally, those taciturn dogcow handlers who inspired me to discover much about the Macintosh on my own.

Coming Attractions

Some of the features being considered for future releases of MacEnvy include: 1) info about *all* monitors, and more of it; 2) info about *all* mounted drives, and more of it; 3) Battery, Sleep, and other Portable-related info; 4) more SCSI and NuBus info (vendor names, revision levels, and that sort of thing); 5) System Heap size, maximum number of open files, and memory usage info; 6) a list of all INITs; 7) interactive Life. Enough for now!

Comments, Suggestions, Etc.

I can be contacted via electronic mail at:

```
{zardoz felix}!dhw68k!thecloud      (from UUCP mailers)
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thecloud@dhw68k.cts.com@dasnet#     (from AppleLink)
```

or

The AppleBus BBS (818) 919-5459 (box #8, or send mail to sysop)

Hope you find MacEnvy to be a useful software addition to your Macintosh system!

— Ken McLeod
February 1990

