

# A Brief Derive Version History

Martin Hepperle - 2022-2025



1980



1985

The following pages present a tabulation of versions of Derive and associated products like muLISP, muSIMP and, muMath. Derive was implemented in muLISP.

Unfortunately, most printed manuals for these software products seem to be unavailable in scanned form, which is a pity. For example, scans of the following manuals would be very welcome to preserve this piece of software history:

- “muLISP-81 Reference Manual”
- “muLISP-82 Reference Manual”
- “muLISP-85 Reference Manual”
- “muLISP-86 Reference Manual”, The Soft Warehouse, 408 p., 1986, Honolulu, Hawaii
- “muLISP-87 Reference Manual”, The Soft Warehouse , 439 p., 1987, Honolulu, Hawaii

Albert D. Rich, the main author of muLISP, died at age 74 in 11 August 2023. Together with David Stoutemyer he founded Soft Warehouse in 1979, which was active until 1999. He was the main author of muLISP. Using muLISP, Albert and David developed muMATH, followed by Derive. Later, Theresa Shelby adapted it to the Windows environment, enhancing its graphics capabilities.

The first versions ran on 8-bit CP/M systems and were later ported and further developed under 16-bit MS-DOS and MS-Windows. The development finally ended up at Texas Instruments. Here, it was the starting point for computer algebra systems for TI's graphing pocket calculators.

The following table highlights the growth of primitives implemented in muLISP systems (MS-DOS version, if not noted otherwise, without extensions loaded). Additional functions were included through external files, as needed.

**Table 1: Number of LISP primitives available in the various muLISP versions.**

muLISP-80 (CP/M)	89 primitives (8080 version before Microsoft licensing)
muLISP-80 2.0 (CP/M)	88 primitives (version licensed to Microsoft)
muLISP-83 4.11 (CP/M)	118 primitives (version licensed to Microsoft)
muLISP-83 4.11	121 primitives
muLISP-85 5.01	303 primitives
muLISP-86 5.10	354 primitives
muLISP-87 6.00	411 primitives, irrational and transcendental functions: IRRATNAL.LSP
muLISP-87 6.10	415 primitives, irrational and transcendental functions: IRRATNAL.LSP
muLISP-90 7.20	421 primitives, irrational and transcendental functions: IRRATNAL.LSP

## DOS Extender (XM) Versions

These versions became available with muLISP-90 and use Extended Memory. The following numbers were obtained in DOS-Box.

muLISP-90	(RECLAIM) gives 340'467 bytes free
muLISP-90 XM	(RECLAIM) gives 15'002'227 bytes free

**muLISP™:  
An unCOMMON  
LISP!**

muLISP™ is an uncommonly good AI programming environment for MS-DOS™ and PC-DOS™ computers. Compare it with a merely COMMON LISP (Golden Common Lisp® Version 1.00):

	muLISP	GCL
Execution Time	40 sec.	143 sec.
Memory Required	128K	512K
Retail Price	\$250	\$495

Write for a more detailed comparison. We also offer muMATH™, the symbolic math calculator for micros.

Golden Common Lisp is a registered trademark of Gold Hill Computers.

**Soft Warehouse Inc.**  
Founded 1979  
PO Box 11174, Honolulu, HI 96828-0174 • (808) 734-5801 (After Noon PST)  
MC/VISA MCI ID: 241-7437 © 1985 Soft Warehouse

**YES!** I'd like to know more about muLISP and muMATH. Please send me more information today.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Company \_\_\_\_\_  
Position \_\_\_\_\_

**No matter how you express it, it still means DERIVE® is half price.**

$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$     $\lim_{x \rightarrow 0} \frac{x}{\sin(2x)}$     $\frac{1}{2}$

$\sum_{n=1}^{\infty} \frac{1}{2^{n+1}}$    **0.5**    $\int_0^1 x dx$

**DERIVE®**

The DERIVE A Mathematical Assistant program lets you express yourself symbolically, numerically and graphically, from algebra through calculus, with vectors and matrices too—all displayed with accepted math notation, or 2D and 3D plotting. DERIVE is also easy to use and easy to read, thanks to a friendly, menu-driven interface and split or overlay windows that can display both algebra and plotting simultaneously. Better still, DERIVE has been praised for the accuracy and exactness of its solutions. But, best of all the suggested retail price is now only \$125. Which means DERIVE is now half price, no matter how you express it.

**System requirements**  
DERIVE: MS-DOS 2.1 or later, 512K RAM, and one 3½" disk drive. Suggested retail price now **\$125 (Half off!).**

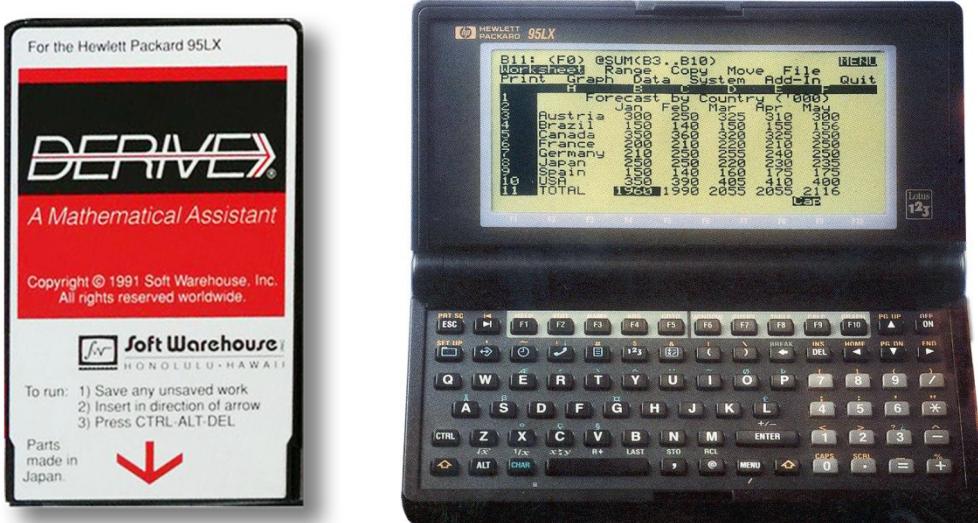
**DERIVE ROM card:**  
Hewlett Packard 95LX & 100LX Palmtop, or other PC compatible ROM card computer. Suggested retail price now **\$125!**

**DERIVE XM (eXtended Memory):**  
386 or 486 PC compatible with at least 2MB of extended memory. Suggested list price now **\$250!**

DERIVE is a registered trademark of Soft Warehouse, Inc.

Soft Warehouse, Inc. • 3660 Waialae Ave Ste. 304 • Honolulu, HI, USA 96816-3236 Ph: (808) 734-5801 • Fax: (808) 735-1105

Figure 1: Advertisements for muLISP and muMATH in 1985 and Derive in 1994.



**Figure 2: Derive was also available as a PCMCIA ROM card for the HP 95LX Palmtop (Screen shows the built-in Lotus 1-2-3).**

Year	Product/Version	Operating System and Comments
1977	muLISP-77	“micro LISP”, implemented on IMSAI 8080
1977	muSIMP-77	“microcomputer Structured Implementation Language”, written in muLISP-77
1979	January 1	<i>The Soft Warehouse</i> founded by Albert D. Rich, David R. Stoutemyer
1979	muMath-79	CP/M (8080, Z80), TRS-80 DOS, written in muSIMP-77
1980	muLISP-80	CP/M, with muStar, (8080), 10/06/80, before licensing to Microsoft
1980	muMath-80	Apple II (ADIOS-80?, native 6502), Apple II (Z80 card with CP/M), and TRS-80
1980	muLISP-80	CP/M, Version 2.0, licensed by Microsoft
1980	muLISP-80	CP/M, Version 2.03, licensed by Microsoft
1980	muMath-80	CP/M, written in muSIMP-80 2.02 (Microsoft)
1980	muMath-80	CP/M, written in muSIMP 2.03, licensed by Microsoft
1981	muMath-80	CP/M, written in muSIMP 2.10, 04/25/81, licensed by Microsoft
1981	muMath-80	CP/M, written in muSIMP 2.12, 07/09/81, licensed by Microsoft
1981	muMath-80	CP/M, Osborne 1, written in muSIMP-80 2.14, 12/19/81 (Microsoft)
1981	muLISP-80	CP/M, Version 2.15, licensed by Microsoft
1981	muLISP-81	IBM PC and CP/M
1982	muLISP-82	IBM PC and CP/M, see Micro/Systems Journal Review, May/June, 1985
1982	muMath-82	IBM PC, see PC-Magazine Review, December, 1983
1982	muMath-80	Apple II/ADIOS-81, 01/29/82, written in muSIMP 2.15, 03/01/82 (Microsoft)
1983	muLISP-83	CP/M-80, Soft Warehouse Version 4.10 03/07/84, licensed by Microsoft
1984	muLISP-83	CP/M-80, Soft Warehouse Version 4.11 03/22/84, licensed by Microsoft
1984	muLISP-83	IBM PC, Soft Warehouse Version 4.11 03/22/84, licensed by Microsoft
1984	muMath-83	IBM PC, Version 4.12 (8088), probably the last version of muMATH
1985		company name changed to <i>Soft Warehouse Hawaii</i> .
1985	muLISP-85	IBM PC MS-DOS, Microsoft LISP Version 5.01 09/15/85
1986	muLISP-86	IBM PC MS-DOS, Microsoft LISP Version 5.10 01/06/86
1987	muLISP-87	IBM PC MS-DOS, Soft Warehouse Version 6.01 06/17/87
1988	muLISP-87	IBM PC MS-DOS, Soft Warehouse Version 6.03, 07/12/88
1988	muLISP-87	IBM PC, MS-DOS, Soft Warehouse Version 6.10, 12/07/88

<b>Year</b>	<b>Product/Version</b>	<b>Operating System and Comments</b>
1988	Derive 1.00	MS-DOS, implemented in muLISP, released on October
1988	Derive 1.02	MS-DOS, written in muLISP-87 (© 1983, 1985, 1986, 1987)
1988	Derive 1.13	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1988	Derive 1.51	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1988	Derive 1.53	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1988	Derive 1.56	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1988	Derive 1.60	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1988	Derive 1.61	MS-DOS
1988	Derive 1.62	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1989	Derive 2.00	MS-DOS, price \$200
1990	muLISP-90	IBM PC, Version 7.10, \$150, up to 640 KB
1990	muLISP-90 XM	IBM PC, Version 7.10, \$300, up to 16 MB with PharLap Extender (EMS)
1990	Derive 2.013	MS-DOS, written in muLISP-87 (© 1983, 1987, 1989)
1990	Derive 2.033	MS-DOS, written in muLISP-87 (© 1983, 1987, 1990)
1990	Derive 2.05	MS-DOS, written in muLISP-90
1990	Derive 2.053	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1990	Derive 2.083	MS-DOS, written in muLISP-90
1991		Derive User Group (DUG) founded, newsletter published up to 2024
1992	Derive 2.50	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990), HP 95LX Card
1992	Derive 2.54	MS-DOS, written in muLISP-90
1992	Derive 2.55	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1993	Derive 2.58	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1993	muLISP-90 XM	IBM PC, Version 7.16 (02/10/93)
1993	Derive 2.55 XM	MS-DOS, written in muLISP-90 XM Version 7.16 (02/10/93) uses PharLap extender
1993	Derive 2.57 XM	MS-DOS, written in muLISP-90 XM Version 7.17 (07/14/93), uses PharLap extender
	Derive 2.58	MS-DOS, written in muLISP-90
1993	Derive 2.60	MS-DOS, written in muLISP-90
1993	Derive 2.60 XM	MS-DOS, uses PharLap extender (EMS)
1994	muLISP-90	IBM PC, Version 7.20 (02/07/94)
1994	muLISP-90 XM	IBM PC, Version 7.20 (02/07/94), uses PharLap extender (EMS)
1994	Derive 3.00	MS-DOS, first version to support Acrospin for 3D graph animation
1994	Derive 3.00y	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1994	Derive 3.00y XM	MS-DOS, written in muLISP-XM 7.21, uses PharLap extender (EMS)
1994	Derive 3.02	MS-DOS
1994	Derive 3.05	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1995	Derive 3.06 XM	MS-DOS, written in muLISP-XM 7.21 (08/09/95), uses EMS
1995	muLISP-90 XM	MS-DOS, Version 7.30 (10/13/95)
1995	Derive 3.10	MS-DOS, written in muLISP-XM 7.30 (10/13/95), uses EMS
1995	Derive 3.10 G	MS-DOS, written in muLISP-XM 7.30 (10/13/95), uses EMS, German
1995	Derive 3.10 XM	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990), EMS
1995	Derive 3.10 XMG	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990), EMS, German
1995	Derive 3.11 XM	MS-DOS, uses EMS
1995	Derive 3.12	MS-DOS
1995	Derive 3.13	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1995	Derive 3.14	MS-DOS, written in muLISP-90 (© 1983, 1987, 1990)
1995	Derive 3.14 XM	MS-DOS, uses EMS
1996		new versions for Windows written in “muLISP for Derive”

<b>Year</b>	<b>Product/Version</b>	<b>Operating System and Comments</b>
1996	Derive 4.00	MS-DOS; first Version for Windows released in October
1996	Derive 4.01	MS-DOS; Windows, but not for Windows XP
1996	Derive 4.02	MS-DOS; Windows, but not for Windows XP
1996	Derive 4.03	MS-DOS; Windows, but not for Windows XP
1996	Derive 4.04	MS-DOS, written in muLISP 7.40 (08/28/96), 16/32-bit; Windows
1996	Derive 4.05	MS-DOS, 16/32-bit (muLISP Version 7.40 (04/15/97)); Windows
1996	Derive 4.05a	MS-DOS, 16/32-bit; Windows 3.x
1996	Derive 4.06	MS-DOS, written in muLISP-XM 7.40 (06/25/97), 16/32-bit; Windows
1996	Derive 4.07	MS-DOS, written in muLISP-XM 7.40, 16/32-bit; Windows
1996	Derive 4.08 XM	MS-DOS, uses EMS
1996	Derive 4.09	MS-DOS, 32-bit Extender; Windows (have update only)
1996	Derive 4.10	MS-DOS, 32-bit Extender; Windows (have update only)
1996	Derive 4.11	MS-DOS, written in muLISP 7.40 (06/04/98); Windows
	Derive 4.13	MS-DOS; Windows, but not for Windows 2000
1999		takeover by Texas Instruments, MS-DOS version dropped
2000		rewrite in “C” for TI-92 and future calculators
2000	Derive 5.00	Windows 3.x
2000	Derive 5.01	Windows 95, 98, NT (16 June 2000)
2000	Derive 5.02	Windows 95, 98, NT (30 June 2000)
2001	Derive 5.03	Windows 95, 98, NT, 2000 (15 January 2001)
2001	Derive 5.04	Windows 95, 98, NT, 2000 (11 April 2001)
2001	Derive 5.05	Windows 95, 98, NT, 2000 (5 December 2001)
2002	Derive 5.06	Windows 95, 98, ME, NT, 2000, XP (10 October 2002), written in muLISP for DERIVE 7.43 (03/06/01)
2003	Derive 6.00	Windows 98, ME, 2000, XP
2004	Derive 6.01	Windows 2000, XP (not: 95, 98, ME, NT 4.0 due to Unicode), (3 March 2004)
2004	Derive 6.10	Windows 98, ME, 2000, XP, written in muLISP for DERIVE 7.45 (08/17/04), connects to TI-89, TI-89 Titanium, TI-92+, TI Voyage 200
2007		Texas Instruments ends development and distribution of Derive

Notes:

- colors used in table:
  - red: I have archived a copy of the files.
  - black: must exist somewhere, I found references to or screenshots of these versions.
- The prefix “mu” stands for “micro”.
- There are probably more intermediate versions not listed here, as Soft Warehouse often provided small ad-hoc updates to fix problems reported by users.

## Companion Programs

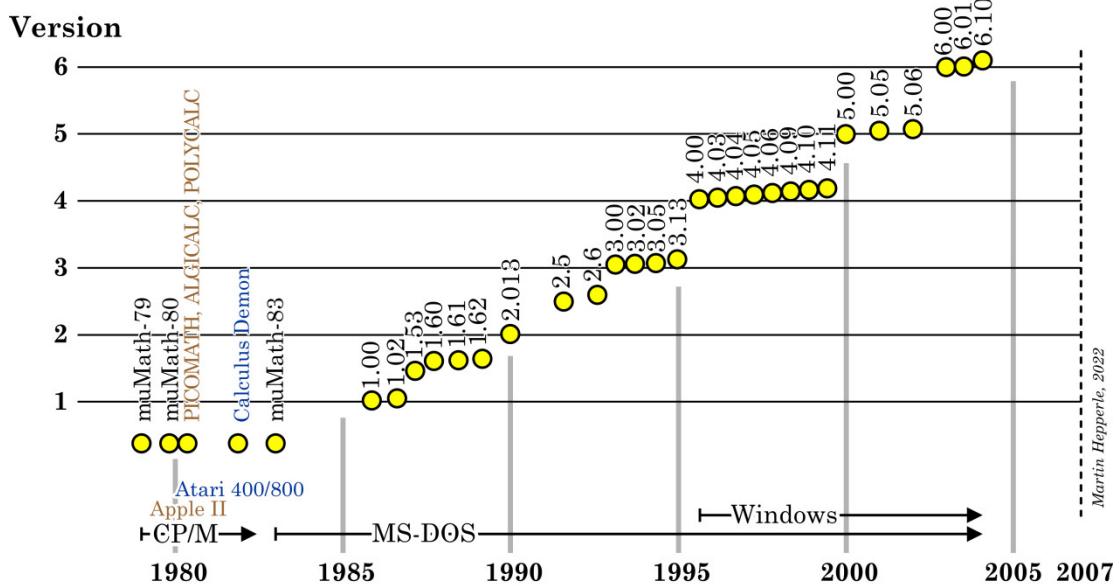
The Derive versions for MS-DOS starting with Derive 3.0 supported the external program *Acrospin*. *Acrospin* could display 3D meshes of three dimensional graphics. The data was transferred from the Plot menu via an .ACD text file which contains lists of coordinates and straight line connectivities.

## Localization

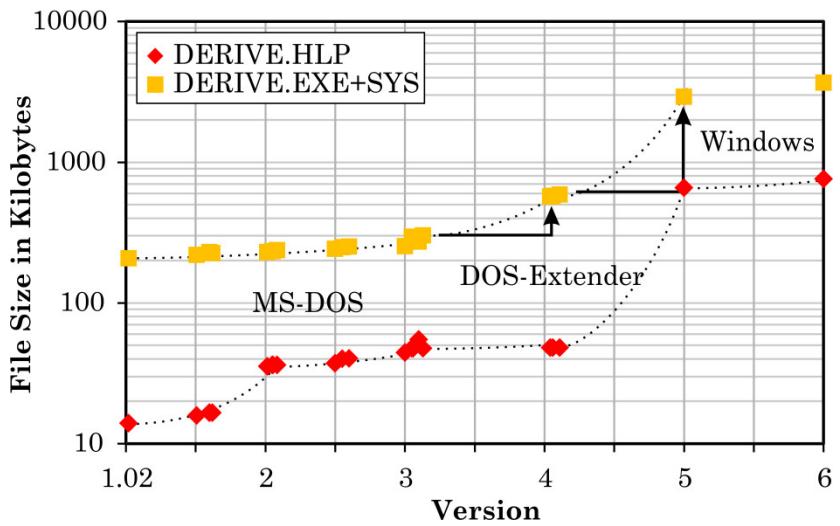
Most messages from Derive versions since 2.053 can be localized by adding a language file “DERIVE.LAN”. This file contains pairs of English and foreign translations for the Prompt and Message Lines, but not for the menus. The menu bar is still in English and some of the prompts are not

fully translated, for example the yes/no question prompt “Y/N” which expects a ‘Y’ or ‘N’ key to be pressed.

Derive versions since 3.05 allowed for localization of the menus by adding a menu file “DERIVE.MNU” which contains a hierarchical LISP list containing the translated menu structure and the English commands to execute.



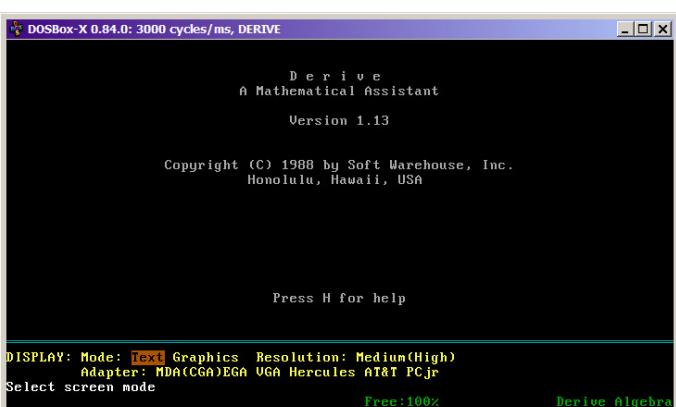
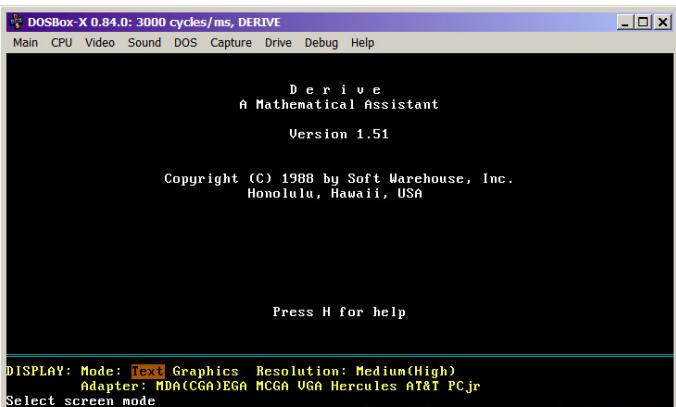
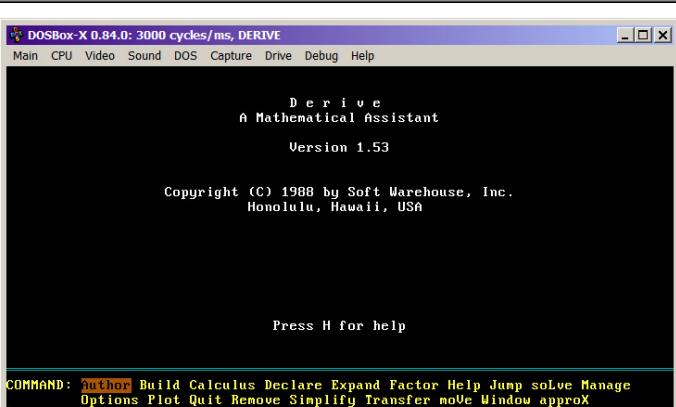
**Figure 3:** Derive version numbers versus publication year.



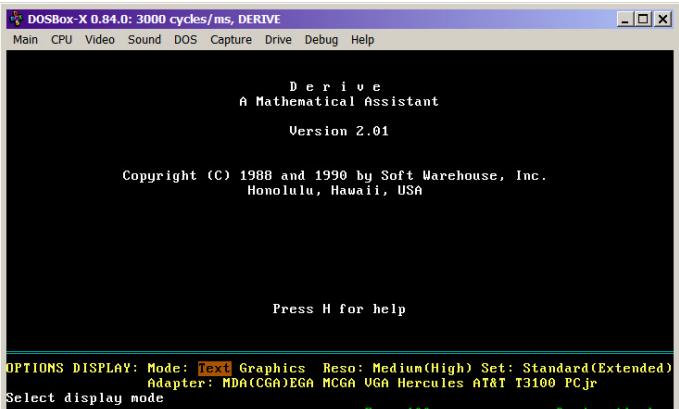
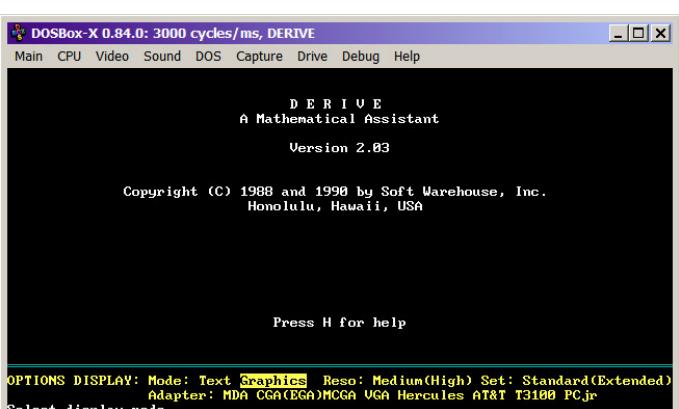
**Figure 4:** Growth of the main Derive files versus publication year. The size of the executable programs is related to the increasing number of features and also to changes of the underlying operating platform (moving from DOS to Windows).

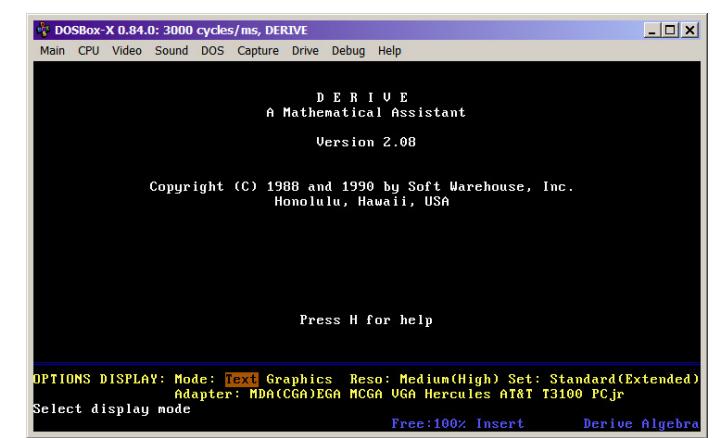
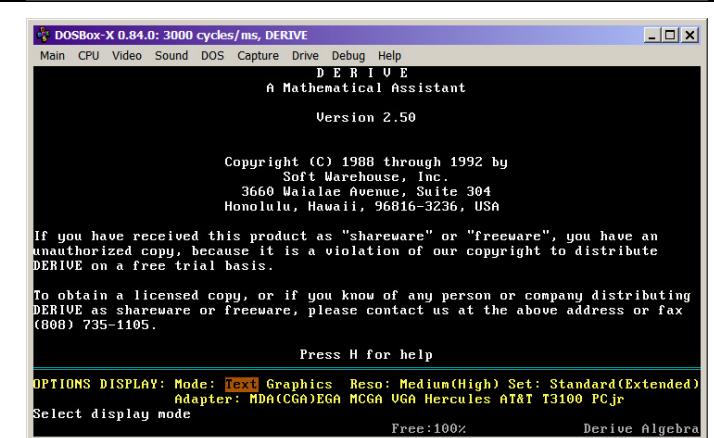
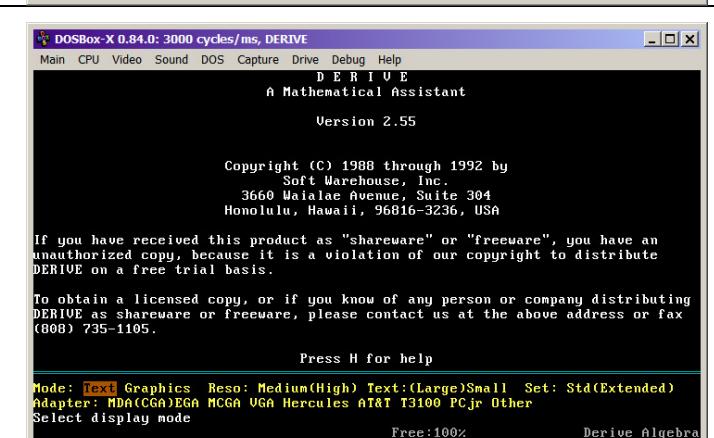
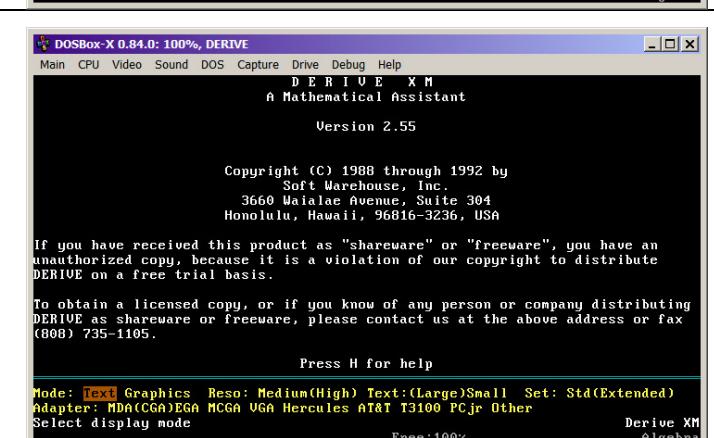
## Derive Opening Screens

Derive can be installed and run on modern systems using the a DOSBox simulation environment. The following screenshots were taken with Options / Display active to show the graphics cards supported by each version.

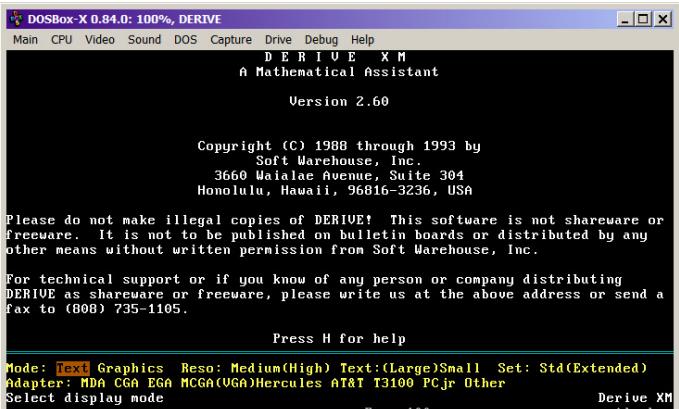
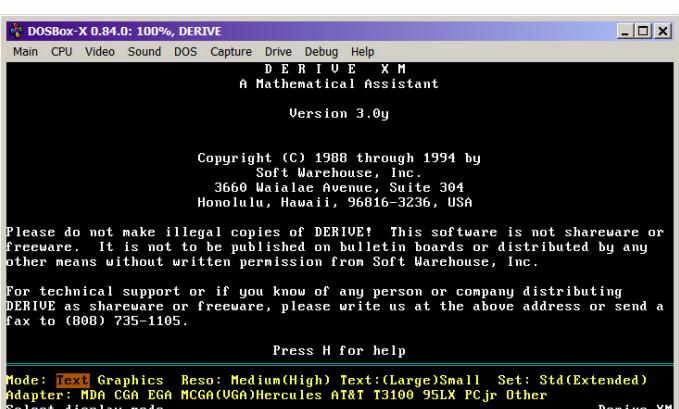
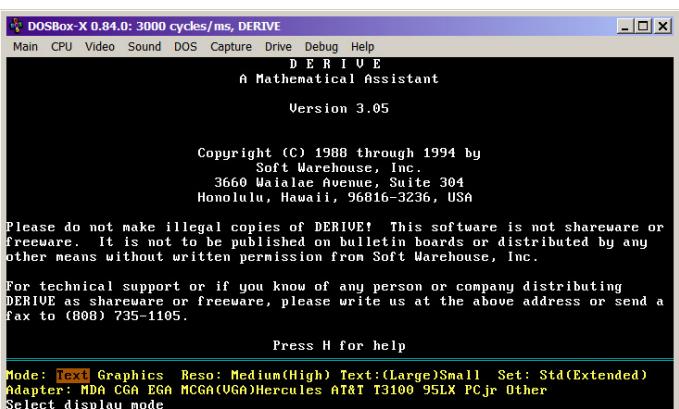
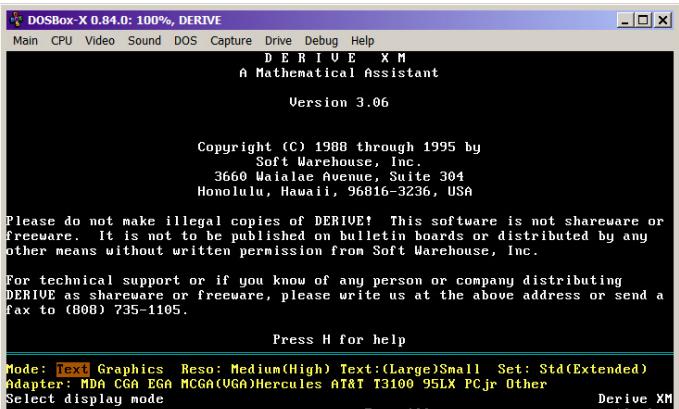
	<p>1988 Version 1.02</p> <p>This version supports most graphics adapters of that era including VGA.</p>
	<p>1988 Version 1.13</p>
	<p>1988 Version 1.51</p>
	<p>1988 Version 1.53</p>

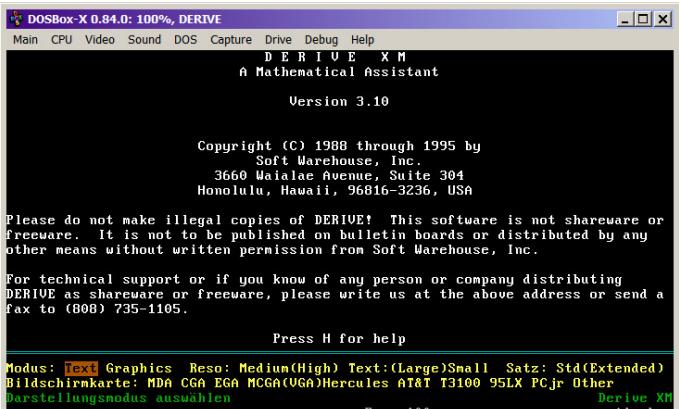
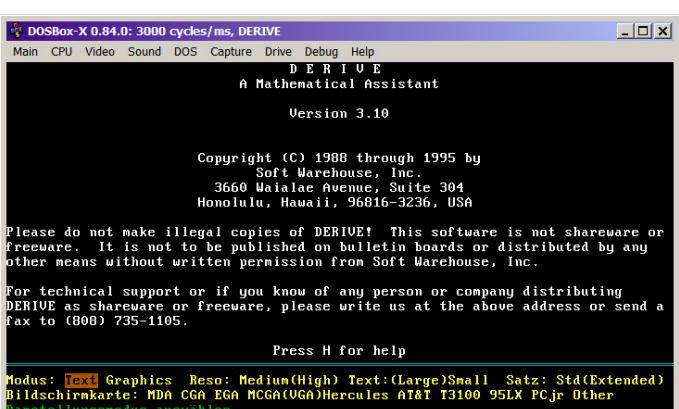
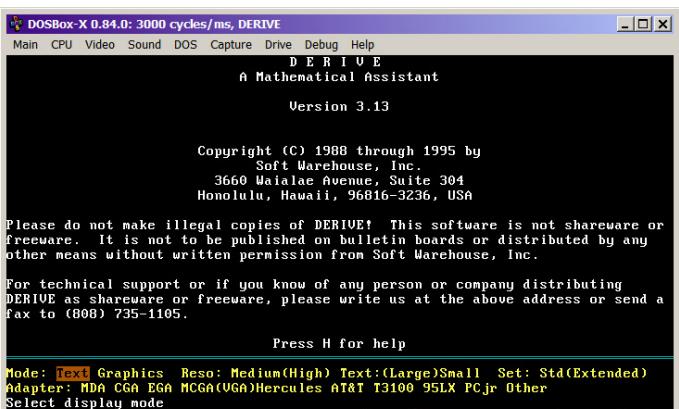
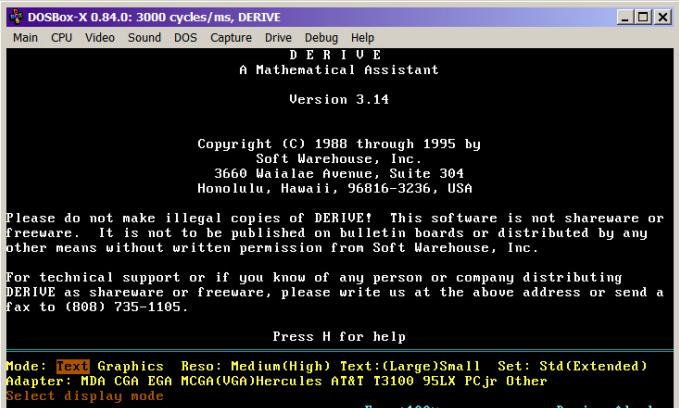
	<p>1988 Version 1.56</p>
	<p>1988 Version 1.60</p> <p>This version added a display driver for the Toshiba T3100 laptop computer (which btw. has the same 640 x 400 pixel screen memory organization as the AT&amp;T 6300/Olivetti M24/HP Vectra).</p>
	<p>1988 Version 1.61</p>
	<p>1988 Version 1.62</p>

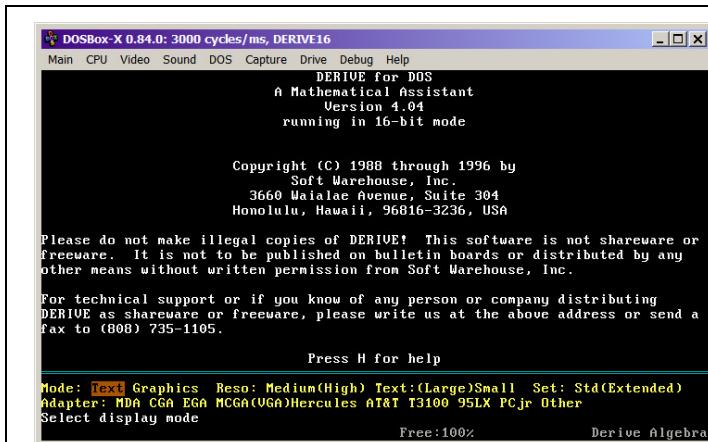
	<p>1990 Version 2.013</p>
	<p>1990 Version 2.033</p>
	<p>1990 Version 2.05</p>
	<p>1990 Version 2.053</p>

	<p>1990 Version 2.083</p>
	<p>1992 Version 2.50</p>
	<p>1992 Version 2.55</p>
	<p>1992 Version 2.55 XM</p>

	<p>1993 Version 2.57 XM</p>
	<p>1993 Version 2.58</p>
	<p>1993 Version 2.60</p>

	<p><b>1993</b> <b>Version 2.60 XM</b></p>
	<p><b>1994</b> <b>Version 3.0y XM</b></p> <p>This version used a so called DOS Extender and added support for the display of the HP 95LX palmtop computer.</p>
	<p><b>1994</b> <b>Version 3.05</b></p>
	<p><b>1995</b> <b>Version 3.06 XM</b></p> <p>Version using a DOS Extender.</p>

 <p>DOSBox-X 0.84.0: 100%, DERIVE</p> <p>Main CPU Video Sound DOS Capture Drive Debug Help</p> <p><b>D E R I V E X M</b> A Mathematical Assistant</p> <p>Version 3.10</p> <p>Copyright (C) 1988 through 1995 by Soft Warehouse, Inc. 3660 Waialae Avenue, Suite 304 Honolulu, Hawaii, 96816-3236, USA</p> <p>Please do not make illegal copies of DERIVE! This software is not shareware or freeware. It is not to be published on bulletin boards or distributed by any other means without written permission from Soft Warehouse, Inc.</p> <p>For technical support or if you know of any person or company distributing DERIVE as shareware or freeware, please write us at the above address or send a fax to (808) 735-1105.</p> <p>Press H for help</p> <p>Modus: Text Graphics Reso: Medium(High) Text:(Large)Small Satz: Std(Extended) Bildschirmkarte: MDA CGA EGA MCGA(VGA)Hercules AT&amp;T T3100 95LX PCjr Other Darstellungsmodus auswählen Free:100% Derive XM Algebra</p>	<p>1995</p> <p>Version 3.10 G</p> <p>User interface translated into German.</p>
 <p>DOSBox-X 0.84.0: 3000 cycles/ms, DERIVE</p> <p>Main CPU Video Sound DOS Capture Drive Debug Help</p> <p><b>D E R I V E</b> A Mathematical Assistant</p> <p>Version 3.10</p> <p>Copyright (C) 1988 through 1995 by Soft Warehouse, Inc. 3660 Waialae Avenue, Suite 304 Honolulu, Hawaii, 96816-3236, USA</p> <p>Please do not make illegal copies of DERIVE! This software is not shareware or freeware. It is not to be published on bulletin boards or distributed by any other means without written permission from Soft Warehouse, Inc.</p> <p>For technical support or if you know of any person or company distributing DERIVE as shareware or freeware, please write us at the above address or send a fax to (808) 735-1105.</p> <p>Press H for help</p> <p>Modus: Text Graphics Reso: Medium(High) Text:(Large)Small Satz: Std(Extended) Adapter: MDA CGA EGA MCGA(VGA)Hercules AT&amp;T T3100 95LX PCjr Other Select display mode Free:100% Derive Algebra</p>	<p>1995</p> <p>Version 3.10 XMG</p> <p>This version used the DOS extender and also came with the user interface translated into German.</p>
 <p>DOSBox-X 0.84.0: 3000 cycles/ms, DERIVE</p> <p>Main CPU Video Sound DOS Capture Drive Debug Help</p> <p><b>D E R I V E</b> A Mathematical Assistant</p> <p>Version 3.13</p> <p>Copyright (C) 1988 through 1995 by Soft Warehouse, Inc. 3660 Waialae Avenue, Suite 304 Honolulu, Hawaii, 96816-3236, USA</p> <p>Please do not make illegal copies of DERIVE! This software is not shareware or freeware. It is not to be published on bulletin boards or distributed by any other means without written permission from Soft Warehouse, Inc.</p> <p>For technical support or if you know of any person or company distributing DERIVE as shareware or freeware, please write us at the above address or send a fax to (808) 735-1105.</p> <p>Press H for help</p> <p>Mode: Text Graphics Reso: Medium(High) Text:(Large)Small Set: Std(Extended) Adapter: MDA CGA EGA MCGA(VGA)Hercules AT&amp;T T3100 95LX PCjr Other Select display mode Free:100% Derive Algebra</p>	<p>1995</p> <p>Version 3.13</p>
 <p>DOSBox-X 0.84.0: 3000 cycles/ms, DERIVE</p> <p>Main CPU Video Sound DOS Capture Drive Debug Help</p> <p><b>D E R I V E</b> A Mathematical Assistant</p> <p>Version 3.14</p> <p>Copyright (C) 1988 through 1995 by Soft Warehouse, Inc. 3660 Waialae Avenue, Suite 304 Honolulu, Hawaii, 96816-3236, USA</p> <p>Please do not make illegal copies of DERIVE! This software is not shareware or freeware. It is not to be published on bulletin boards or distributed by any other means without written permission from Soft Warehouse, Inc.</p> <p>For technical support or if you know of any person or company distributing DERIVE as shareware or freeware, please write us at the above address or send a fax to (808) 735-1105.</p> <p>Press H for help</p> <p>Mode: Text Graphics Reso: Medium(High) Text:(Large)Small Set: Std(Extended) Adapter: MDA CGA EGA MCGA(VGA)Hercules AT&amp;T T3100 95LX PCjr Other Select display mode Free:100% Derive Algebra</p>	<p>1995</p> <p>Version 3.14</p>

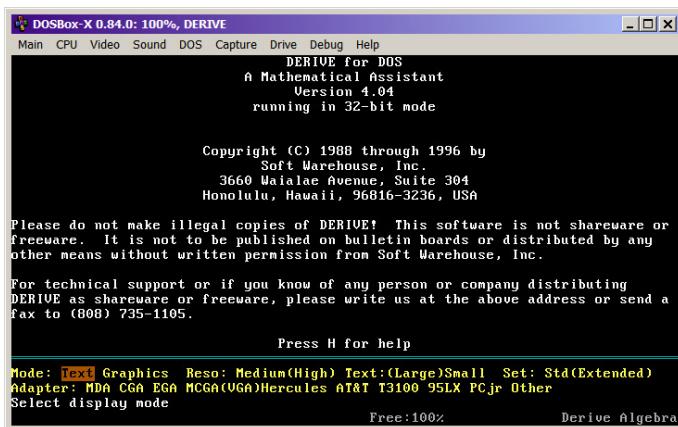


1996

## Version 4.04

This version came with executables for a 16-bit and a 32-bit DOS Extender variant.

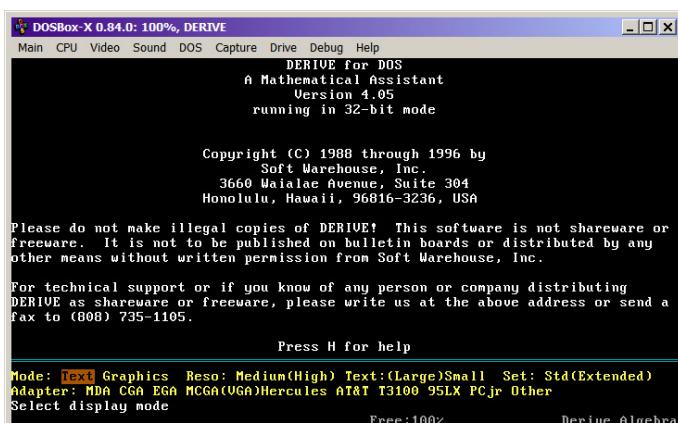
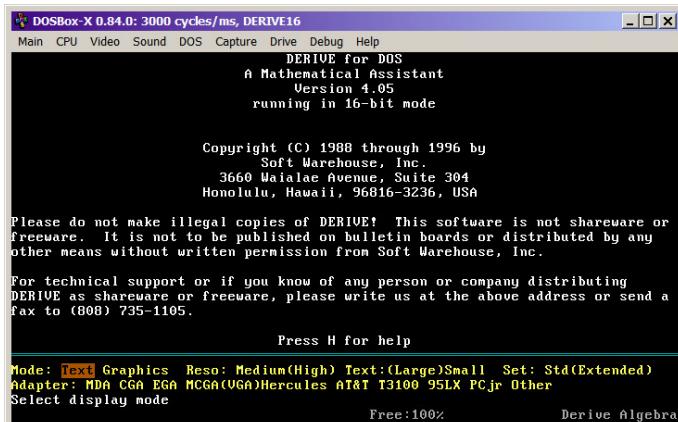
The 32-bit option required a 32-bit processor like the 80386.

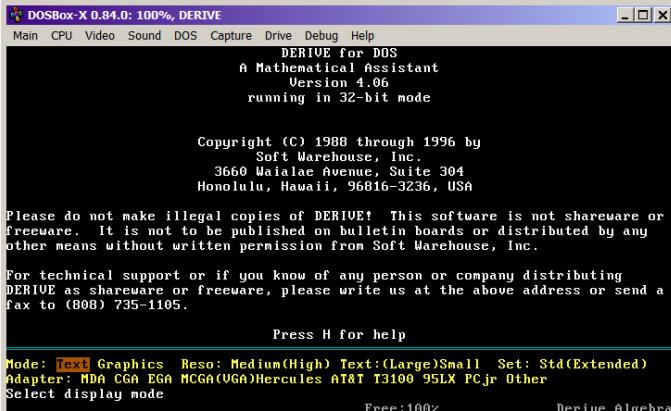
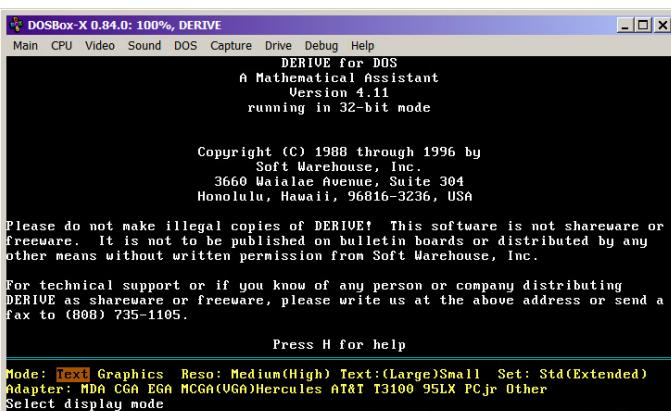
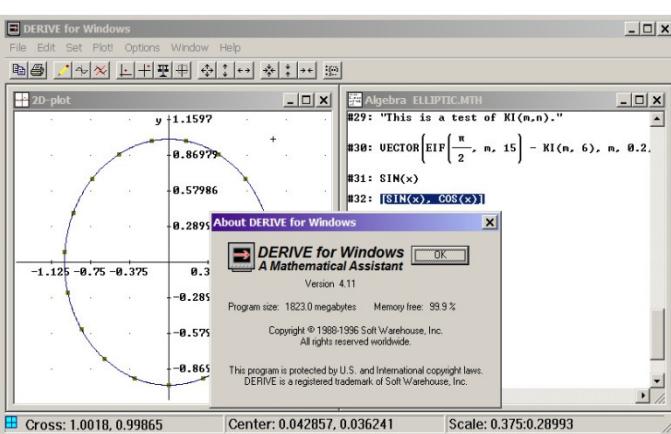


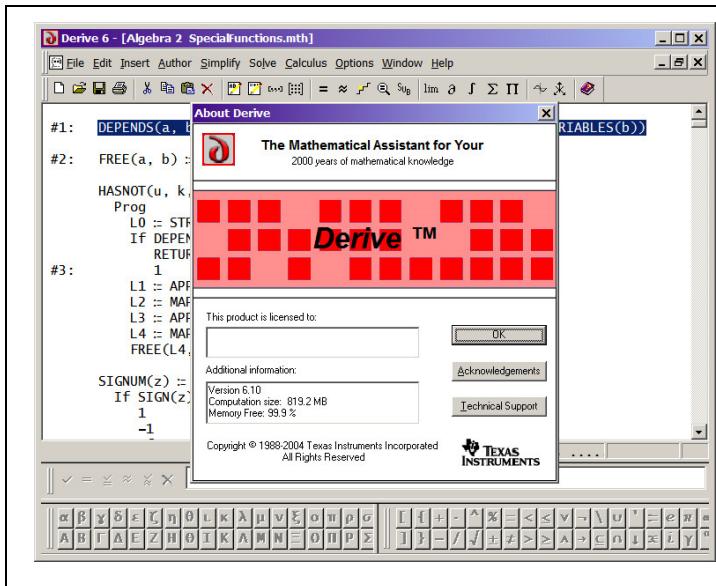
1996

## Version 4.05

This version came with executables for a 16-bit and a 32-bit DOS Extender variant.



	<p><b>1996</b> <b>Version 4.06</b></p> <p>This version also used the 32-bit DOS Extender.</p>
	<p><b>1996</b> <b>Version 4.11</b></p> <p>This version used also used the 32-bit DOS Extender.</p> <p>It still supported the HP 95LX palmtop computer.</p>
	<p><b>1996</b> <b>Version 4.11</b> <b>Windows</b></p> <p>This version did not yet have the edit bar at the bottom but used a dialog for authoring equations.</p> <p>Soft Warehouse Copyright Notice.</p> <p>It still worked under Windows 7 and 11.</p>



2004

Version 6.10

Windows

Here we see the symbol palettes and the edit bar at the bottom.

Texas Instruments Copyright Notice.

It still worked under Windows 7 and 11.

## Terminal Installation for muLISP and Derive

The early versions of muLISP up to version 6.10 and Derive up to version 2.083 tried to find out on which system they were started and chose the appropriate terminal driver. In case the autodetection scheme failed, they presented a screen with the available terminal types. It is also possible to patch the executable file for a specific terminal.

The terminal list also includes the HP-110 and HP-150. Therefore, Derive versions up to 2.083, which have been built with these muLISP versions, can be patched to work with the HP-150 and HP-110. However, graphics mode and equation displays are not properly supported (axes and points use incorrect characters and would require additional patches).

The \*.COM files contain a list of terminals.

```
1 = Other generic MS-DOS computer
2 = IBM PC compatible computer
3 = ANSI.SYS screen or VT-100 Terminal
4 = TI Professional Computer
5 = Zenith Z-100 Computer or VT-52 Terminal
6 = Hewlett-Packard HP-150 Computer
7 = Hewlett-Packard HP-110 Computer
8 = NEC Advanced PC or ADM-3A Terminal
9 = NEC PC-9801 Computer
A = Fujitsu Computer
```

The terminal byte or word in the following context contains the terminal number. Here, it has been changed to “06”, the HP-150 Computer.

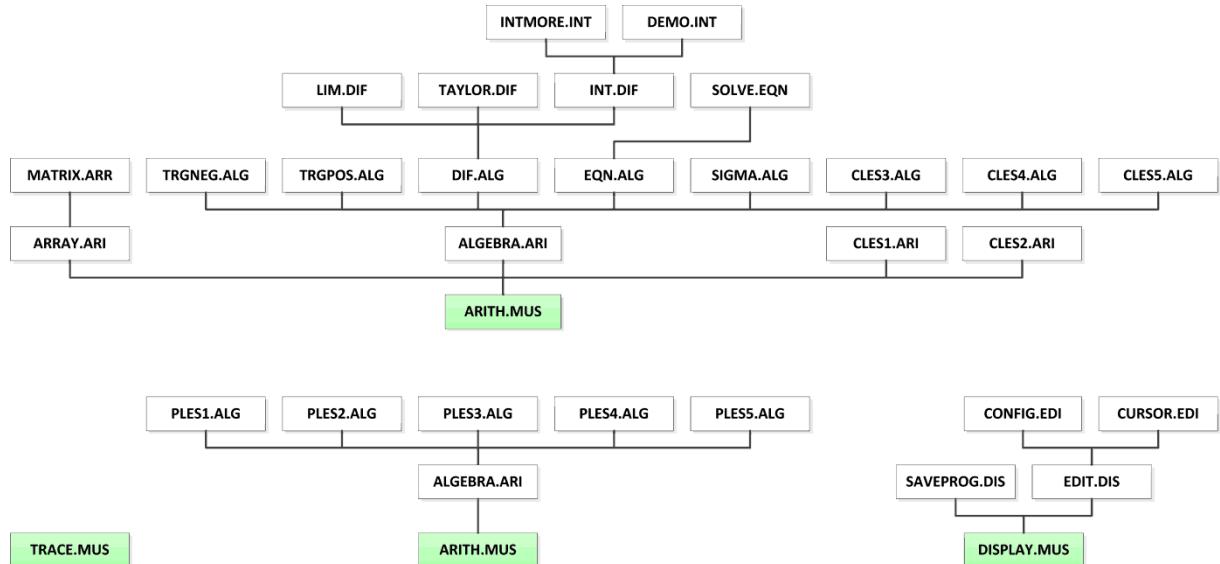
```
00000440 00001E1E 04000300 00004F00 0000FF07 .....0.....
00000450 5C7C64FF FF1A0006 00000000 00242000 \|d.....$ .
          ^^ terminal type
00000460 0000004C 5350FF00 002E1110 FF000000 ...LSP.....
```

## muMATH

Before Derive there was muMATH. It was written in the muSIMP language which itself was implemented in muLISP. muSIMP provided a simpler and more conventional user interface to muLISP.

Due to the memory restrictions of the CP/M, TRS-80 and, Apple II systems, a hierarchical subset of the available files has to be loaded with the RDS command, depending on the problem to solve.

The figure below shows the dependency tree of these packages. For example the approximation of a function by a Taylor series requires reading the sequence of files ARITH.MUS, ALGEBRA.ARI, DIF.ALG and, TAYLOR.DIF. Note that the file extensions indicate the required package.



**Figure 5: Dependency tree of muMATH 2.15 for CP/M modules. Start loading at the green nodes, following the tree up to the final module. Versions for MS-DOS included additional modules and preloaded combinations in SYSTEM files.**

Following the generic 8080 CP/M, native TRS-80 and native Apple II versions, at least two versions for MS-DOS (muMATH-82 and muMATH-83) have been developed. These seem to be missing in the known internet archives. Similarly, the initial version muMATH-79 for CP/M seems to have been lost.

<pre> muSIMP-80 2.02 COPYRIGHT (C) 1980 MICROSOFT LICENSED FROM THE SOFT WAREHOUSE  ? RDS(ARITH,MUS,A); @: ARITH  ? RDS(ALGEBRA,ART,A); @: ALGEBRA  ? RDS(DIF,ALG,A); @: DIF  ? RDS(TAYLOR,DIF,A); @: TAYLOR  ? TAYLOR(SIN(X),X,0,2); @: X*COS(0) - X^2*SIN(0)/2 + SIN(0)   </pre>	<p>muMATH 2.02 8080 CP/M Version</p> <p>This version was running on generic CP/M systems using the 8080 and Z80 processors.</p>
--	---

```

APPLE IIc ADIOS-81           VERSION 01/29/82
20 MUSIMP     COM | 20 MUSIMPPX   COM
4 TRACE      MUS | 17 ARITH     MUS
11 ALGEBRA    ARI | 18 EQN       ALG
4 SOLVE      EQN | 19 ARRAY     ARI
7 MATRIX     ARR | 20 LOG       ALG
3 TRGPOS     ALG | 21 TRGNEG   ALG
3 DIF        ALG | 22 INT       DIF
8 INTMORE    INT | 23 TAYLOR   DIF
9 LIM        DIF | 24 SIGMA    ALG
1 DISKCOPY   COM |
FREE ON 1: 1 K-BYTES
1)RUN MUSIMP.COM

```

muMATH  
native Apple II  
ADIOS Version

This version came with its own ADIOS operating system to maximize the memory available for muMATH.

```

@: 1
? GCD(125,7)
@: 1
? GCD(144,21)
@: 3
? RDS(ALGEBRA,ARI,1)
@: ALGEBRA

? RDS(DIF,ALG,1)
@: DIF

? RDS(TAYLOR,DIF,1)
@: TAYLOR

? TAYLOR(SIN(X),X,0,2)
@: X*COS(0) - X^2*SIN(0)/2 + SIN(0)
?
```

The actual code of muMATH was probably a semi-automatic translation of the 8080 code to 6502 and not very fast.

## Literature related to Derive

(There are many books about Derive and its application and quite a few of them have been listed in the Derive Users Group Newsletters. Some can be loaned from your local library or from archive.org. Therefore, the following list contains only a few examples.

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- [3] Arney, David C., "Exploring Calculus with Derive", Addison-Wesley, 1992, 166 pages.
- [4] Arney, David C., "The Student Edition of Derive", Addison-Wesley, 1992, 387 pages, uses Derive Version 2.
- [5] various authors, "Lab Resource Manual to accompany The Student edition of Derive", 1992, 69 pages.
- [6] Glynn, Jerry, "Exploring Math from Algebra to Calculus with Derive", Mathware, 1992, 154 pages, uses Derive Version 2.51.
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- [10] Townend, M. Stewart, Pountney, David C., "Learning Modelling with Derive", Prentice Hall, 1995, 244 pages.
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- [12] Abbey, May Kay, "Calculus Explorations using Derive", Saunders College Publishing, 1996, 84 pages.
- [13] Bogess, Al, et. al., "Single Variable Calculus with Derive", Brooks/Cole Publishing Company, 1999, 208 pages.
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[refers to muSIMP/muMATH-79]
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[refers to muLISP-80 CP/M]
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- [8] Bortz, J., Diamant J., "LISP for the IBM Personal Computer", (review, includes muLISP-83), BYTE Magazine, July, 1984.
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