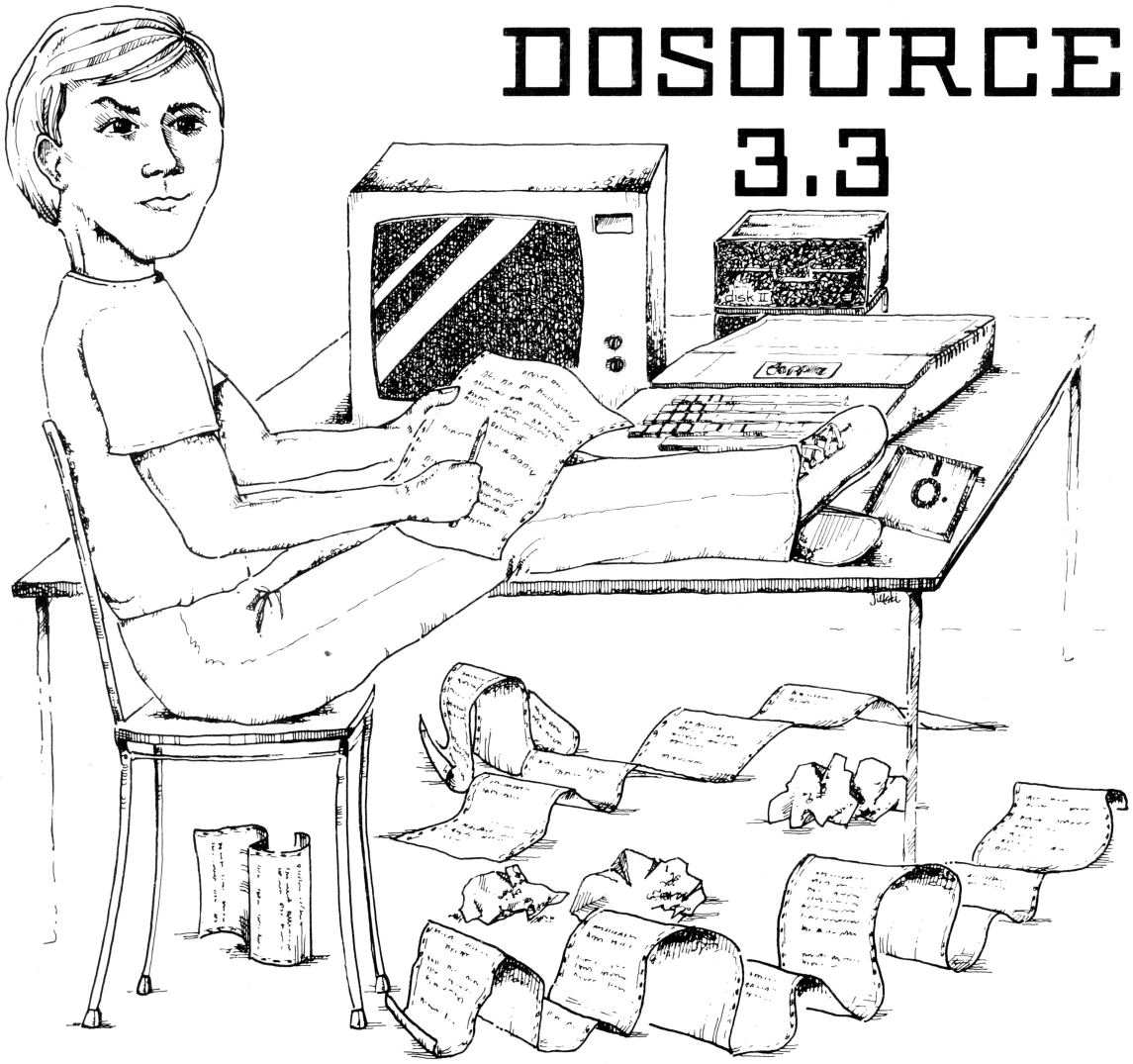
LAZER MICRO SYSTEMS, INC.

Presents

39.95
Apple II or II Plus
Machine Language
and Text File
DOS 3.3

DOSOURCE 3.3



prepared by
RANDY HYDE

DOSOURCE 3.3

Notes:

DOS 3.3 (object code) is copyrighted by Apple Computer Inc. Purchase of DOSOURCE 3.3 does not entitle the user to use DOS 3.3 (or any modifications of DOS 3.3) without permission of Apple Computer, Inc.

DOSOURCE 3.3 is copyrighted by Lazer Systems (both (C) and (P)). The source listings are proprietary and may not be copied except where allowed by federal copyright laws. Modifications made to DOSOURCE are still copyrighted by Lazer Systems, you may not distribute modified sources regardless of the extent of the modification. Lazer Systems' copyright encompasses the actual source listing (in particular the source listing including comments and lables), as mentioned above the copyright to DOS 3.3 belongs to Apple Computer.

DOSOURCE is provided without warrantee or support. While we have tried to insure that the code and comments are correct there is still a large chance of error. Remember, DOSOURCE is a disassembled listing with comments obtained by studying the disassembled code. We did not have a source listing available to use while disassembling the code, therefore there is a high probability that some sections of code were not commented fully or properly due to ignorance on our part.

DOSOURCE - Disassembled and commented by Randy Hyde of Lazer Systems. Published by Lazer Systems.

© copyright 1981, all rights reserved

One final note on the copyright: With a product such as DOSOURCE the temptation to "give only my closest friends a copy" is very high. To be of any use this product is provided on copiable media. Even if you give only one copy out to your best friend, we're going to sue. Because you're friend is not bound by any contractual obligations, chances are he's going to give out lots of copies, and his friends are going to give out even more. The damage caused by giving even one copy to a friend is enormous, and we can't allow it. Even though it makes us sound like bad guys, we'll take you to court if we can prove you've been giving out copies of our software, for your own sake don't push your luck.

THE DOSOURCE 3.3 PACKAGE INCLUDES . . .

DOSOURCE 3.3 is contained on two diskettes. The diskettes are 16-sector format, but do not contain a DOS on the diskette (and hence they cannot be booted). DOSOURCE is provided on two diskettes, with both sides being utilized. Due to the nature of floppy disks, especially when both sides are used, you should immediately make a backup of all four sides (preferably on four separate disks).

Four of the files provided are LISA 2.5 compatable source files, four files are simple text files that can be loaded into any editor (memory allowing) that handles text files, and the last three files are assembled listings in text file format.

The textfiles all contain lower case characters so you should have a lower case adapter such as the Lazer MicroSystems' Lower Case + Plus to display the characters properly. Most printers these days support lower case output so dumping a listing to a printer should pose no problem.

USING DOSOURCE 3.3 WITH LISA 2.5

The LISA compatable files are "L" type files ("B" type files if you are not booted under LISA) which can only be loaded into LISA v2.5 or later. LISA v2.5 is available from On-Line Systems, 36575 Mudge Ranch Road, Coarsegold, CA 93614, (209) 683-6858.

The LISA compatable files are found on side one of the DOSOURCE disk package. The files are: CDI.PART 1, CDI.PART 2, FILE.MNGR, and RWTS. CDI.PART 1 and CDI.PART 2 comprise the DOS control-D interpreter/BASIC interface. CDI.PART 1 chains in the CDI.PART 2 file during assembly, so CDI.PART 2 must be on-line during assembly.

FILE.MNGR is the DOS 3.3 file manager. It is totally independent of the control-D interpreter and the RWTS. This file comprises approximately the middle third of DOS 3.3

RWTS (Read or Write a Tract/Sector) is the last third of DOS 3.3. As with FILE.MNGR, it is a totally separate file that is assembled independently of CDI or FILE.MNGR.

The equates in each of the files assume DOS is being assembled for a 48K machine. To assemble at some other address carefully check the equates at the beginning of each file.

All files can be assembled with LISA's text and symbol table fences set at $1800 and $8000 respectively (the default values). You must, however, OBJ the code to a safe place (such as $800) before assembling, especially if any changes are made to DOS. Do not assemble DOS on top of DOS in memory. If any changes were made to DOS such action could cause the system to hang. Assemble the code down at $800 and move the code up to $9D00 after the assembly. Good Luck!

THE DOSOURCE 3.3 TEXT FILES

Provided on sides one and two are text file versions of the LISA 2.5 source listings. These text files were obtained by using the LISA v2.5 Write command. As such, the first line of each text file containes the characters "INS". This line should be removed if you are attempting to modify DOSOURCE for an assembler other than LISA.

The text file versions of DOSOURCE were provided to allow ambitious users to possibly modify DOSOURCE for an assembler other than LISA. While LISA's syntax is very close to that used by most other assemblers available for the Apple II (and, in fact, DOSOURCE uses a subset of LISA's features making it even more compatable), there is one LISA v2.5 feature used extensively within DOSOURCE that is not found in other assemblers—LISA's local lables. Other than changing the local

labels, most changes to DOSOURCE are simple text substitutions which are easily handled by any good text editor such as Apple PIE or TED.

DEALING WITH LISA'S LOCAL LABELS

DOSOURCE uses LISA's local label facilities extensively in the source listings. LISA's local labels are based on the local labels first described by D.N. KNUTH in The Art of Computer Programming, Vol. 1: Fundamental Algorithms. A local label consists of the up-arrow ("^") followed by a single digit in the range 0-9. Local label definitions may be repeated throughout the text file, so it is not uncommon to file the local label "^2" replicated 10 times within a text file.

To reference a local label use the symbols ">" and "<" followed by a digit in the range 0-9. "<n" (where n is a digit) instructs LISA to reference the first occurence of "^n" found previously in the file. ">n" instructs LISA to reference the next occurence of "^n" found in the file. For example, JMP<1 starts at the current line, checks for "^1", if found then the address of the current line is used (identical to JMP *), if^1 is not found on the current line then LISA looks for^1 on the previous line, etc. JMP>1 would cause LISA to look for^1 starting on the next line after the JMP, and look on successive lines until ^1 is found.

The beauty of local labels is the fact that the programmer doesn't have to dream up all kinds of different, descriptive names for short loops, branches around one or two instructions, etc. Figuring out names for the major DOS routines was bad enough, but having to think up unique names for every little loop that initialized something bordered the impossible. Local labels to the rescue! Rather than inventing all kinds of labels such as RM1, RM2, RM3, . . .local labels were used instead, making the source file more readable, getting it out two months earlier, and (something you can relate to) lowering the cost of the final package.

Which is fine and dandy unless you own an assembler other than LISA. If you insist on converting DOSOURCE 3.3 to some assembler other than LISA, keep in mind it is not a trivial job, checking for all references of a local label (both forwards and backwards) is not trivial. You'll be in for a lot of work. The first question you should ask yourself is "Is the amount of time I'm going to spend on this project justifiable? Especially considering the $79.95 price tag on LISA v2.5?" If your answer to this question is yes, call Lazer Systems at (714) 735-1041, maybe someone else has already done the work for you. If not, and you're willing to convert DOSOURCE to some other assembler, Lazer Systems is interested in marketing the final version with some sort of royalty arrangement to cover the work you've put into the product.

One final note: DOSOURCE is copyrighted by Lazer Systems. Even though you converted it to work with another assembler you do not have the right to sell such sources. Such actions are the lowest form of software piracy around and is completely illegal under existing software copyright laws. Lazer Systems is more than willing to work out marketing or license agreements with individuals who convert DOSOURCE for some other assembler.

THE ASSEMBLED LISTINGS

Provided on sides two, three, and four of the DOSOURCE package are the CDI.LIST, FM.LIST, and RWTS.LIST files. These files are assembled listings of the control-D interpreter, the file manager, and RWTS respectively. They may be dumped to a printer for use as a refrence in the event you do not have LISA, and don't plan on reassembling DOS (i.e., you only wish to patch certain portions of DOS 3.3 or call some routines within DOS). Since it is a simple text file, any program that reads a text file and dumps it to a printer will work just fine and dandy to dump these listings. The following Applesoft program is an example of such a program:

```
10 PRINT CHR$ (4);"PR#1"
15 PRINT CHR$ (4);"MON I"
20 PRINT CHR$ (4); "OPEN RWTS.LIST"
30 PRINT CHR$ (4); "READ RWTS.LIST"
40 ONERR GOTO 80
50 GET A$
60 PRINT A$;
70 GOTO 40
80 PRINT CHR$ (4);"PR#O"
90 PRINT CHR$ (4);"CLOSE":END
```

DON'T CALL US! DON'T CALL APPLE!

DOSOURCE is provided entirely for the purchaser's education. Lazer Systems and Randy Hyde cannot assume responsibility for the information presented herein. Please don't call us to ask questions about how DOS operates, chances are there won't be any one in who knows anything about the internal workings of DOS and you'll just be wasting a long distance phone call. If you find a bug in the listings, or have a suggestion to make about the listings feel free to give us a call, we're always interested in improving our products.

Don't call Apple! Not because we're afraid of anything, several people at Apple knew this product was going to be released a couple of months before its actual release—but why bother them with a product they have nothing to do with? While on the subect of Apple, one reason Apple computer has never released sources to DOS is because they don't want people calling routines internal to DOS. By doing so, Apple would be forced to leave DOS the way it is and would not be able to offer upgrades, such as DOS 3.3, where the internal structure of DOS has been changed. Keep in mind that if you make calls to routines inside DOS, or perform other such patches, you may not be compatable with future releases of DOS from Apple Computer. Is this going to stop anyone from calling stuff inside DOS? No, but at least you were forewarned.

LAZER MICRO SYSTEMS, INC.

Presents

DOSOURCE 3.3

- At Last, the mystery of DOS revealed.
- DOSOURCE is a detailed listing of DOS 3.3 complete with comments & meaningful labels.
- A necessary addition to any programmers library.

prepared by Randy Hyde