

Apple II + /IIe/IIc/IIIGS

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Beginners Guide
to Assembly Language

Nine reasons the MindCraft™ Assembler is a red-hot best seller.



1. Ease of Use. Beginners will enjoy writing assembly language programs with this menu-driven Macro Assembler/Editor, complete with Help screens. No memorization! **2. Power.** The more advanced user will appreciate the power, speed and convenience of designing and using Macros. **3. MacroSoft.** Consider the purchase of this powerful macro language. Lets you write Applesoft-like programs that are compiled directly into standalone machine language. **4. Adaptability.** Automatically adapts to whatever Apple you have, whether it's 40 or 80 column display, upper or lower case, or extended memory. **5. Advanced Features.** Powerful Editor, Subroutine Library, Macro collections. Support for the 65C02 microprocessor. **6. Superior Documentation.** Concise, easy-to-follow manual with lots of examples. **7. Support.** You're always just a phone call away from free help and advice. **8. Reputation.** Thousands of satisfied Assembler users have helped make MindCraft the leading publisher of programming aids like GALE, ProAmperSoft and Key Perfect. **9. Price.** At just \$49.95, The Assembler's the best value you'll find — anywhere! And you can SAVE \$12.00 off the retail price of the best selling book: *Beginners Guide to Assembly Language* when you order The Assembler. You'll learn the nuts and bolts of A/L programming with more than 30 hands-on examples!

Includes both ProDOS and DOS 3.3 versions.
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Magic with Macrosoft

Presented at KansasFest 2010 by Peter Neubauer

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Once Upon A Time Only Advanced Programmers Could Achieve Machine Language Speed.

But today *anyone* with just a basic knowledge of programming can write programs that run at machine language speed. It's easy with MACROSOFT, a new language that works with the MindCraft™ Assembler.



Using MACROSOFT, you write Applesoft-like programs which are converted into machine language by the MindCraft Assembler. Like magic. You get the benefits of speed and efficiency without the hassle and hard work of learning machine language!

Imagine, running your programs up to 10 times faster than compiled Applesoft. That's up to 50 times faster than regular Applesoft!

Create lightning-fast games and spectacular graphics. Ideal for number crunching! For the more advanced programmer there's the convenience of mixing assembly language and MACROSOFT in the same program.

Now you don't have to be a magician to move up to machine language — with MACROSOFT!

To order fill out the attached coupon or call 1-800-888-1660

Author: Alan D. Floeter
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It's Fall 1978

I think I just paid \$1200 for my first Apple II.

No disk drives, monitor or
anything else.

But it was MY computer in MY house.

Any assembly language had to
be done by hand.

So I did what any normal programmer would do. I
decided to write my own assembler.


It was
truly a labor of love.

At one point, my wife said, why don't we sell your assembler.

I started thinking that maybe
I could make macros to do
BASIC-like functions.

People were very excited about this because of the
speed they could get from their programs.

I still have my original Apple
II.



Some numbers on the keyboard don't work.

It was all open for you to see
and explore.

Those were exciting times.

Your name is Alan Floeter.



Read the full story.



The Complete Hazy Story of The Assembler and Macrosoft from Al Floeter (collected May 6, 2010)

Straight out of college I got a job working with the new microprocessor, the Intel 8080, at a small start up company. Everything was done in assembly language and I learned more in those few years about programming than all my years in college. It was a few years later when I started hearing about personal computers. A computer in my own home! Imagine that - every engineer 's dream! I looked around at the offerings at the time, and decided that the Apple II was my choice - it even had color! I think I paid \$1200 for my first Apple II in the fall of 1978. No disk drives, monitor or anything else. But it was MY computer in MY house.

I obviously spent a lot of time learning all about what could be done with it. BASIC was fine, but I wanted the speed of machine language. There was no assembler you could buy for it at the time. Any assembly language had to be done by hand. So I did what any normal programmer would do. I decided to write my own assembler.

I had to start somewhere so I wrote a simple editor in BASIC. (Remember there was nothing, not even a way to enter text.) Because BASIC was slow, I used a pointer system that would add new lines to the end of the memory block and then when I saved it (to tape, of course) I had to re-arrange everything in the right order. When you hit save, you went to bed - no reason to wait for it.

I then started to write my assembler in BASIC. I called the Apple's ROM mini-assembler from my BASIC program to help with the decoding. I used to call it the world's slowest assembler because it would assemble at the rate of about two seconds per line. But I had a start. I then began re-writing pieces of the BASIC program with assembly code, assembled of course with my assembler. In this way it kept getting faster and more full featured. It was truly a labor of love. I spent my evenings adding features as I thought of them or needed them for my own projects. Around this time my wife and I started writing articles for computer magazines, Call-Apple, Nibble, Kilobaud, a few others. Nibble was our favorite. Mike Harvey was wonderful to us and encouraged us to write more for him. I'd create a handy utility or program and then we'd explain how to use it and the thoughts behind how I did the code. Applesoft renumbering, disk speed up tweeks, graphic routines and the like. I think I wrote a very fast Life program at one point.

I saw a sample of an airplane fighting game somewhere so I wrote a game called Skybombers II. (All using my assembler of course.) Use to play that a lot. I was never beaten (I wrote it after all.) Instant Software started selling software and I inquired if they wanted to sell my game and they said, yes. I still have some original tapes of the program.

My wife and I kept writing articles and I kept improving my assembler. I used my lunch hour at work to write code that I took home and typed in at night. At one point, my wife said, why don't we sell your assembler. I remember saying to her, "Why try? There're a lot of other assemblers out there now. Why market another?" And she said, "The world can always use another assembler." (We still sometimes say that to each other.)

So we asked Nibble if they might be interested in selling an assembler. To my surprise they said yes. Well, it took another year of hard work polishing my assembler so it was good enough for others to use (I knew what to avoid doing, but that wasn't good enough for the general public.) and with enough documentation to make it easy to use.

I think The Assembler was sold by itself for a while, without Macrosoft. I remember when I created the macro concept for The Assembler. I heard that another competing assembler had macros. I thought, well, I can do that. So I add that capability, and once that was in, I started thinking that maybe I could make macros to do BASIC-like functions, but you'd assemble it and the result would be almost assembly like speed. I came up with a list of commands that would be useful and started creating the macros for those commands. Kind of like a crude compiler. People were very excited about this because of the speed they could get from their programs.

In the spring of 1983, my wife and I were asked to speak at a Boston Applefest about Macrosoft. My wife was 6 months pregnant with our second child at the time. We were able to visit with the Nibble staff in person because they were from the Boston area. It was nice to personally meet them all.

I still have my original Apple II. Some numbers on the keyboard don't work. I was always going to fix that. Over the years I bought a Ile, a Ilgs, a Mac, a Mac Plus, Mac Ilci. As I write this, a Mac Plus is sitting on the table behind me. I have a number of II's in the basement that people gave me over the years. Can't bare to part with them. I wrote the code for the Happi printer board. I built a bubble memory disk drive. (Too expensive to market.) All this in my spare time while holding down a real job.

Since my real job uses PC's, I have more PC's in my house now. Makes it easier to work back and forth. I still like Apple's. I have many, many fond memories of those days. Didn't have to worry about the blue screen of death or anything - it was all open for you to see and explore.

Those were exciting times.

Get the software.

www.nibblemagazine.com

Demo

```
* KFEST 2010 Demo by Peter Neubauer
USE MACROSOFT.3.1
USE HIRES.3.1
UEN
MUL
BEGIN      ; Start of code.
HGR2
HCOLOR 3
HPLOT 20,20
LINE 20,100
LINE 100,100
LINE 100,20
LINE 20,20
PAUSE 100
TEXT
PRINT "Hello awesome world."
DIM NAME(40)
PRINT "Enter your name:",
SINPUT NAME
PRINT "Hi ",
SPRINT NAME
PAUSE 100
DIM MAGIC(20)
SLET MAGIC="Peter"
SIF NAME#MAGIC, GOTO DONE
HGR2
VAR X
VAR Y
VAR C
FOR Y=0,191
FOR X=0,191
RND C,8
HCOLOR C
HPLOT X,Y,Y,X
NEXT X
NEXT Y
DONECLEANUP
END
```


Tips

- Case matters. Commands must be upper case.
- Use decimal number. Don't try hexadecimal, octal, or binary.
- Declare variables before use.
- No two dimensional arrays.

Tips

- Line numbers are only for convenience in the editor and not part of the code. Use labels instead.
- Start labels in the first column.
- Start commands in the second column.
- Start full line comments with a “*”.
- Start side-bar comments with a “;”.

Tips

- Use “#” for testing inequality.
- Beware commands that accept specific data types (e.g. INPUT/SINPUT, PRINT/SPRINT, LET/ALET, IF/SIF).

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