Subject: Microcomputer History
Posted by Wayne Parham on Tue, 11 May 2021 21:03:08 GMT
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We talk about tube radios here on AudioRoundTable.com from time to time. Those are definitely vintage pieces of electronics history. But it occurs to me that early microprocessors and microcomputers are too. And since I still have a lot of those eight-bit microcomputers and chips from the 1970s and 1980s, I decided it might be worthwhile to do write-ups on some of them.

So I started out with the Synertek Systems Sym-1. Click the link if you're interested in the early years of microprocessors:
Synertek Systems Sym-1

Subject: Re: Microcomputer History
Posted by Rusty on Tue, 11 May 2021 22:01:36 GMT
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How was old code written? I mean, was it strictly typed out one character at a time? It would seem an incredibly tedious job. Thus these days are there automated shortcuts in this procedure? It still would seem mind numbing. It must take a certain type of person to do this. Reminds me of a summer job I had at an aftermarket truck light manufacturer. The worst job was sitting at a machine crimping wire leads on to a component. I'd go into a trance almost. Don't know how I kept my fingers from being crimped to the wires.

Subject: Re: Microcomputer History
Posted by Wayne Parham on Tue, 11 May 2021 22:19:49 GMT
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Well, yes and yes. On some of the most primitive computers, the code is entered one character (or half-character 'nibble') at a time and, yes, it's incredibly tedious. Which was one of the main early goals or programmers in the early days - to develop languages and operating systems that made programming less tedious.

When you enter code that way, it's called machine code, binary or object code. You are talking directly in the computer's language. You might tell the computer to get the contents of a memory location, load into a temporary place called a register, test the contents (like for equality, less than or greater than) and jump somewhere else in the program if the condition was met. Or maybe you'd load contents from memory, add to contents or another memory and store somewhere else.

Each instruction is one-byte code (in a machine like these), so for example, in the 6502 microprocessor, the load instruction is decimal 169 or hexadecimal A9. Microcomputer guys think in hexadecimal. Lots of minicomputer guys think in octal and that same load instruction is 251 in

octal. So to program in machine code, you hand-enter a bunch of numbers in sequence. That's your program.

Next level up would be assembly language. In that case, you don't have to know the number of each opcode. You can call it by name, or actually by a "shorthand" abbreviation we call a mnemonic. That A9 load code I just described is called LDA in assembly language, the mnemonic for Load Accumulator. You can also label memory locations instead of calling them out by numbers. So it's one level of abstraction above machine code, not much above, just barely.

Then above that would be languages like BASIC or C. Those are more "human-readable" and require an interpreter or compiler to translate the program into machine code for the computer to be able to act upon.

Subject: Re: Microcomputer History
Posted by gofar99 on Fri, 14 May 2021 01:39:08 GMT
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Hi, The first computers I got to work on used machine code...what a pain. Then SPS, Fortran, and Basic. One of the computers occupied a room about 100 X 100 feet. It had a huge bank of tape drives and disk drives (the size of dishwashers). They said it had a megabyte of memory. They used it to compute big time serious science stuff..like planatery ordits and satellite data. As I recall it was Burroughs. The machine they let us use most was an IBM 1620. My phone can run circles around any of them by about a factor of 1,000,000 or so. :roll:

Subject: Re: Microcomputer History
Posted by Wayne Parham on Thu, 22 Sep 2022 18:59:13 GMT
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I love those old multi-platter disk drives. And you're right that they were the size of washing machines. Shook like a washing machine too during rapid disk seek operations. They usually had a large linear motor that moved the heads, and by large, I mean 100 pounds or so. Enough force they could break your arm if it went into emergency retract while you were aligning the heads. So you had to be careful how you adjusted the heads, where you pushed them as you tightened the set screw.

Love the old 9-track tape drives too. Especially the Data General 6026, which used vacuum columns as tape tensioners. It was a beautiful drive. Loved to watch 'em jerk into motion, to seek, retrieve data and return back to BOT.

Quick update - I have created pages on the following computers:
Altair 8800
RCA COSMAC "Elf"
Synertek Systems Sym-1

INMOS Transputer
Just finished the Altair page so that reminded me to come back here and mention it. The Altair page talks about "the old days" and it also has a "build" section with links to places to buy parts. It even has a link to a page that documents the entire build process.

Subject: Re: Microcomputer History
Posted by gofar99 on Fri, 23 Sep 2022 01:44:53 GMT
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Neet stuff. I rememner those disk drives. I almost bought one in a Phoenix surplus store for $25. I just could not figure a way to get it home. It was probably every bit of 250 pounds.

Subject: Re: Microcomputer History
Posted by Wayne Parham on Fri, 23 Sep 2022 19:06:38 GMT
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You're right that the disk drive cabinet would have been at least 250 pounds. Those multi-platter pack drives had huge transformers for the power supply and a linear motor that was 100 pounds, all by itself. And a fairly large support structure in the cabinet to support all that. So they were pretty meaty boxes.

Back in the day, I considered experimenting with using one of the linear motors from a Data General Zebra disk drive as a big subwoofer. But at 100 pounds, I just never "got around to it." :lol:

Linear motor that positions the heads (with shipping head lock in place)

Data General 6061 Zebra Disk Drive

File Attachments
1) DGC_Zebra_6061_Disk_Drive.jpg, downloaded 284 times
2) DGC_Zebra_Linear_Motor.jpg, downloaded 205 times

Subject: Re: Microcomputer History
Posted by gofar99 on Sun, 25 Sep 2022 01:40:06 GMT
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Hi, That looks a lot like the one I was going to buy. Huge and heavy.
