1977: The year of the appliance computer

Vintage Computer Festival East

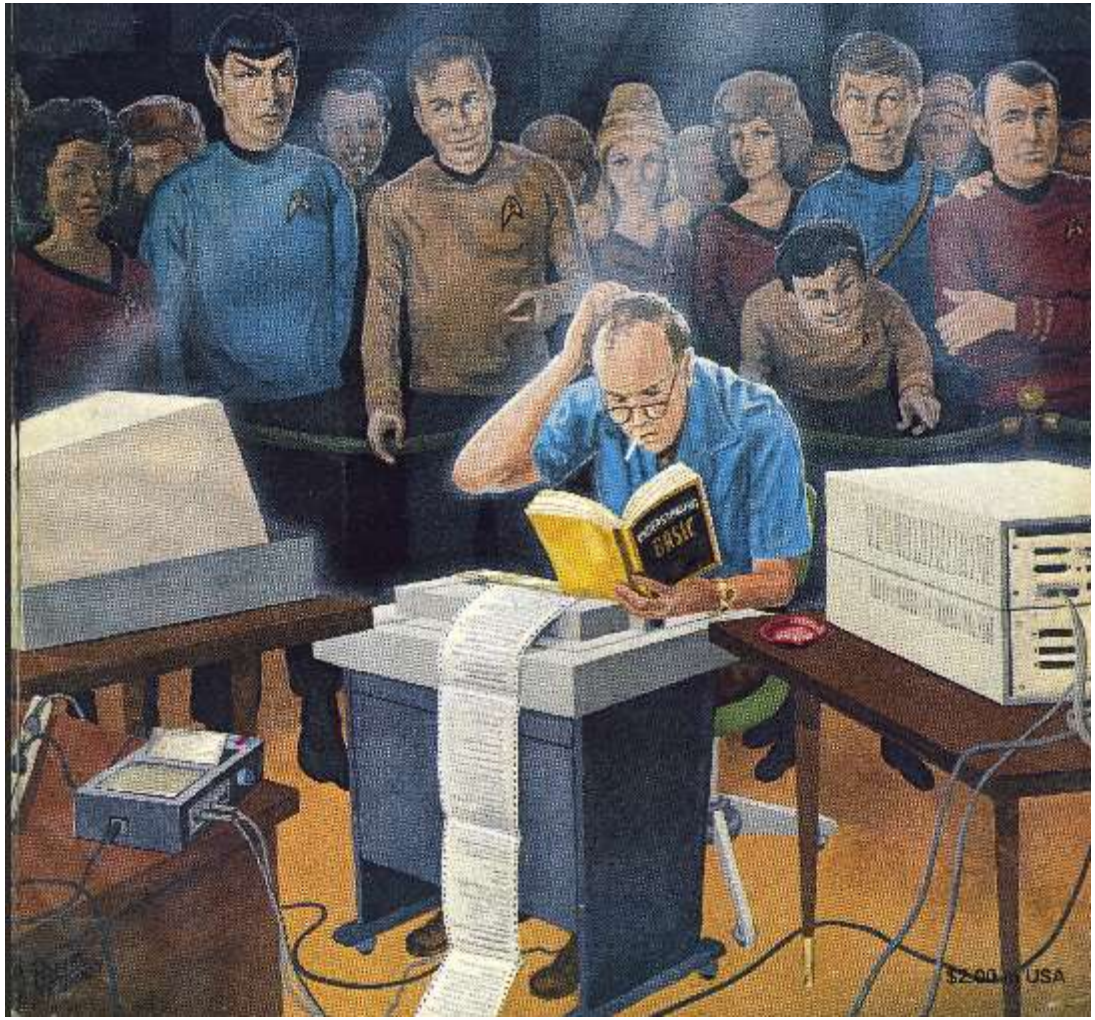
Sunday, April 2, 2017

Bill Degnan

MITS · MOBILE Computer Caravan

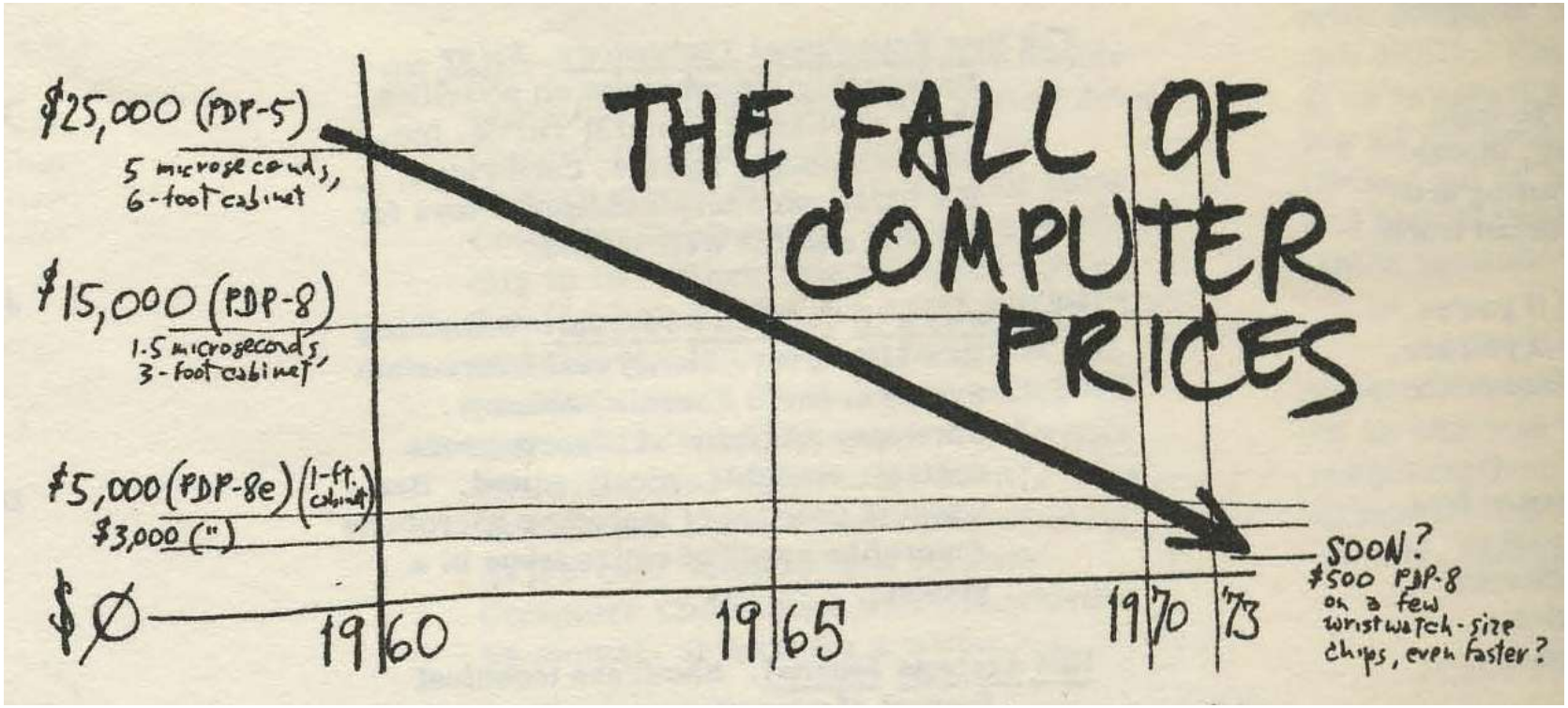
The MITS Mobile Computer Carivan traveled across the USA to demonstrate and teach customers about the MITS Altair, and to help customers with their kit project work.

There has to be an easier way!



Cover, Byte December 1977

Computer Lib / Dream Machines by Theodor Nelson



1977 a Nexus?

- Customer demand for user-friendly computers.
- Larger Manufacturers with finished systems entering the market
- Mass production
- Finished Systems well below $2000
- Multiple PC magazines
- Special Interest Groups/Clubs/Conventions

Enter The “Appliance Computer”

- Phrase coined by Carl Helmers, Byte editor in January 1977
- Finished product desktop general-purpose computer complete with software (BASIC)
- Reasonably Priced, purchased at a retail store or computer shop
- Turnkey Computer – Works right out of the box
- User does not need to know electronics or techniques of tuning of hardware
- User does not need to build custom bootstrap program to initiate system
- User manual uses pictures and examples to teach use, designed for simplicity.
- The point of ownership is not to build the computer and maintain it

Appliance computers for small business? You Bet!

- A single computer is used in a very small business to take the place of several people either by saving the cost of salaries and benefits or freeing people for other tasks.
- Eliminates manual processing of clerical work – inventory, book keeping, spreadsheets, production control, automated process monitoring and measuring, elimination of other paper shuffling.
- New capabilities like presentations, mailing lists and other customer sorting, telephone files, library catalogs other databases. Word processing taking the place of typewriters and copiers.
- Modem communications, sharing data electronically, remote commuting for sales force, email, remote file transfer

Appliance Computer?

Applying the Carl Helmer's definition of the Appliance Computer from 1977….

Appliance Computer?

1969 Honeywell 316 “Kitchen Computer” as shown in Neiman Marcus catalog

$10,000 ($78,000 today)

Two week training course

Appliance Computer?

IBM 5100

- IBM's first personal portable computer, the model 5100.
- The increasing popularity of programmable desktop calculators whetted appetites for more programming power in the same form factor/size.
- The IBM 5100 portable BASIC/APL computer, introduced in September 1975 for under $9000.

Appliance Computer?

SPHERE
CORPORATION
791 South 500 West Dept. 129 (801) 292-8466
Bountiful, Utah 84010

Manufactured by Sphere Corp from 1975-1977
Motorola 6800 / 4-64K
Integrated screen and Keyboard
Boots to command mode, load PDS 1K BASIC, or BASIC compiler.
Kit / some assembly required. FROM $860 to $11,000

Appliance Computer?

The Sol-20 Terminal Computer

- 1st public showing of the SOL was at the Atlantic City PC 76
- Came as a kit

Next Gen Microprocessors

To keep costs and complexity down manufacturers would need something more suitable than the Intel 8080 or the Motorola 6800…

Zilog Z-80

"Z80 incorporates the best features of both the 8080 and the 6800, and adds some very powerful features of Zilog's own creation"

- Same power as 6800, but faster clock speed than both 8080 and 6800
- Z80 can access 64K memory; uses an improved and faster I/O similar to 8080 but quicker memory access, less control logic needed
- Z80 can slow system down to compensate for slower memory
- Z80 can handle dynamic RAM with internal refresh, less complex than 8080
- Z80 can use one or two bytes for op codes vs. 8080 and 6800
- Z80 processes each instruction faster than 8080 or 6800

MOS 6502

- By 1977 the 6502 was a top selling micro CPU
- Thirty-one BASICs tested, the four 6502 versions placed in the top five spots yielding only second place to the Zilog’s new Z80 running at 4 MHz.
- Why so fast? The 6502's many addressing modes make it very efficient and easy to program.
- Memory addressing best for graphics compared to other choices in same market.

Zilog Z-80

What's the bottom line?

- More powerful processor, faster top speed
- More efficient than 6800 or 8080
- Uses cheap memory
- Handle CP/M Better

MOS 6502

- Better graphics
- Inexpensive
- Many addressing modes makes it easy to program
- Not as good for disk operations perhaps

Appliance Computer?

The STM Baby! 1

- 6502 processor / 4-60K RAM
- Tiny Basic on Cassette with ROM monitor
- Not a Kit
- Serial display output
- Completely assembled, tested and burned in
- First appeared in 1976

Appliance Computer?

Ohio Scientific 2P

- BASIC in ROM
- 6502 / 4K RAM
- Audio cassette interface / Ready for RF adapter to TV
- Comes assembled and tested for $598 (late 1977)

The Big Three

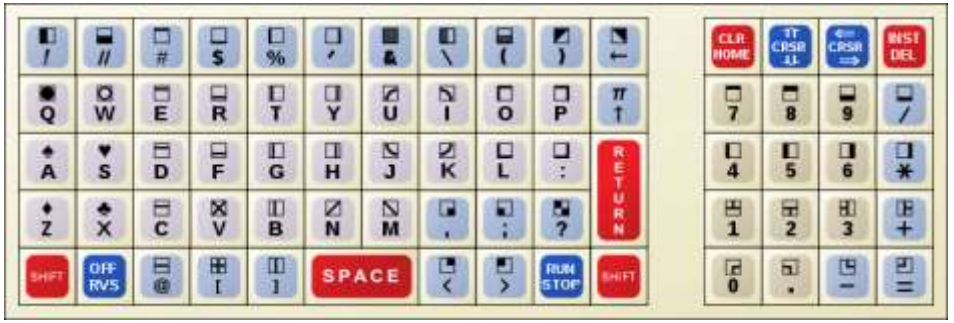
THE PET™
PERSONAL COMPUTER
Just Released
HIGH SPEED PRINTER ACCESSORY
Featuring an IEEE-488 BUS
PET
commodore

PET 2001 Prototype at the Jan 18-20 1977 Gametronics convention

Commodore PET

- First seen in January 1977, also demoed at the first West Coast Computer Faire with the Apple II.
- PET creator Chuck Peddle said that it was named after the PET Rock.

The keyboard →



- Commodore used their experience selling calculators to help determine an optimal price for their PET. $795 for 8K version.
- Fall 1977 – PET's become available for purchase (same as Apple II/TRS 80).

Photo 4: Commodore's new PET computer, a popular item at the show. The unit features 14 K bytes of read only memory including an operating system, diagnostic routines and an 8 K BASIC interpreter by Microsoft. It sells for $595 including 4 K bytes of programmable memory. A lengthy waiting list is predicted for the unit.

Byte Oct 77
Early PET
2001 as it
would have
appeared in
early show
demos

PET Sales Soar

- 1977-78 Commodore is overwhelmed by the demand, causes problems, growth too fast!
- New marketing and management brought in
- 1978-1979 – PET 2001-16/32-N/B, 3016/32 (Europe). In addition to general consumer market, the PET was initially most successful in the education market (compared with the Apple and TRS 80).
- Commodore at this point is working hard also to move into the business market with their PET's.
- Home market unit sales decline: Replaced by VIC-20 (late 1980) and C-64 (Sept. 1982)

Panel Question

Commodore:

Tandy, Apple, or Commodore…which was the most “hacked” by its owner despite being sold as appliance computers? Why?

Panel Question

Commodore:

Knowing of Apple's Disk II, why did Commodore manufacture the IEEE 488 2040 drive? What were the advantages of this drive compared with the Disk II? Who were they selling this drive to?

Panel Question

Commodore:

Describe the SIGs (special interest groups) formed by Commodore owners in the late 70's? Why were these necessary?

Introducing Apple II.

You've just run out of excuses for not owning a personal computer.

Clear the kitchen table. Bring in the color TV. Plug in your new Apple II* and connect any standard cassette recorder/player. Now you're ready for an evening of discovery in the new world of personal computers.

Only Apple II makes it that easy. It's a complete, ready to use computer, not a kit. At $1298, it includes video graphics in 15 colors. It includes 8K bytes ROM and 48 bytes RAM—easily expandable to 48K bytes using 16K RAMs (see here). But you don't even need to know a RAM from a ROM to use and enjoy Apple II. For example, it's the first personal computer with a fast version of BASIC permanently stored in ROM. That means you can begin writing your own programs the first evening, even if you've had no previous computer experience.

The familiar typewriter-style keyboard makes it easy to enter your instructions. And your programs can be stored on—and retrieved from—audio cassettes, using the built-in cassette interface, so you can swap with other Apple II users.

You can create dazzling color displays using the unique color graphics commands in Apple BASIC. Write simple programs to display beautiful kaleidoscopic designs. Or invent your own games. Games like PONG—using the game paddles supplied. You can even add the dimension of sound through Apple II's built-in speaker.

But Apple II is more than an advanced, infinitely flexible game machine. Use it to teach your children arithmetic, or spelling, for instance. Apple II makes learning fun.

Apple II can also manage household finances, chart the stock market or index recipes, record collections, even control your home environment.

Right now, we're finalizing a peripheral board that will slide into one of the eight available mother board slots and enable you to compose music electronically. And there will be other peripherals announced soon to allow your Apple II to talk with another Apple II, or to interface to a printer or teletype.

Apple II is designed to grow with you as your skill and experience with computers grows. It is the state of the art in personal computing today, and compatible upgrades and peripherals will keep Apple II in the forefront for years to come.

Write us today for our detailed brochure and order form. Or call us for the name and address of the Apple II dealer nearest you. (408) 996-1010. Apple Computer Inc., 20863 Stevens Creek Boulevard, Bldg. 35-C, Cupertino, California 95014.

SPECIFICATIONS

- **Microprocessor:** 6502 (1.0MHz)
- **Video Display:** Memory-mapped, 3 modes – all software selectable
  - Text – 40 characters/line, 24 lines, upper case
  - Color graphics – with a new 15-color High-resolution graphics – 280H x 192V, black, white, violet, green
  - 32K RAM minimum required
  - Both graphics modes can be selected to include 4 lines of text at the bottom of the display area
  - Completely transparent memory access. All video generation done in hardware
- **Memory:** up to 48K bytes on board 8-slot 16K maximum
  - Uses either 4K or new 16K dynamic memory chips
  - 2K to 12K ROM, 4K supplied
- **Software**
  - Non-resident BASIC in ROM with new graphics commands
  - Extensive monitor in ROM
- **I/O**
  - 1200 bps cassette interface built on the board
  - Apple game I/O connector
  - Six I/O board slots
  - Speaker
  - Composite video connector

Apple II is also available in basic configuration for the do-it-yourself technician. But all of the features of the Apple II system, but does not include case, keyboard, power supply or game paddles. $970.

*TRS-80 is a trademark of Radio Shack. Apple II plug-ins are standard I/O slots in computer and supplied.

apple computer inc.

- 6502 microprocessor running at 1mHZ
- 4 to 48K of RAM
- A fast 6K integer BASIC in ROM
- 2K System Monitor in ROM
- "transparent" 1K color video with graphics,

  8K color graphics.
- 280 X 192, 40 X 24 text 6 colors maximum

- ASCII keyboard with interface
- Four analog inputs
- a fast cassette interface
- Three digital I/O bits
- An audio "beeper”
- Eight decoded peripheral connectors
- A stylish package
- A (small) power supply

photo: Pinterest.com

Price: US $1298 with 4K RAM US $2638 with 48K RAM

First Introduced: West Coast Computer Faire April 16, 1977

Invented by: Steve Wozniak and Steve Jobs

Panel Question

Apple:

What were the most popular hobbyist magazines /publications read by Apple owners in the late 70's?

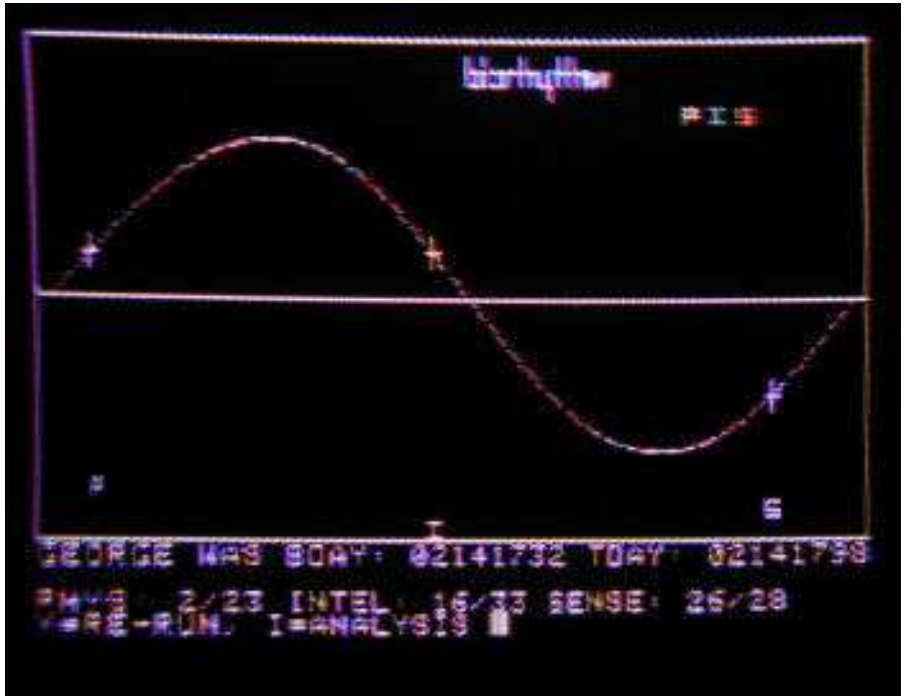
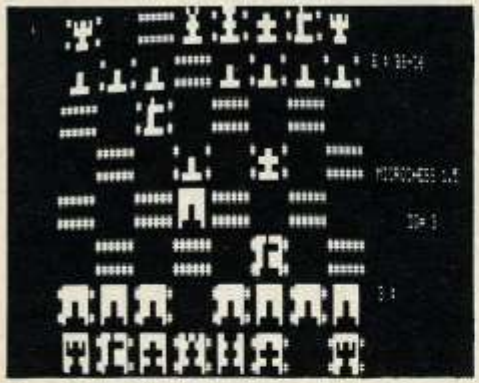


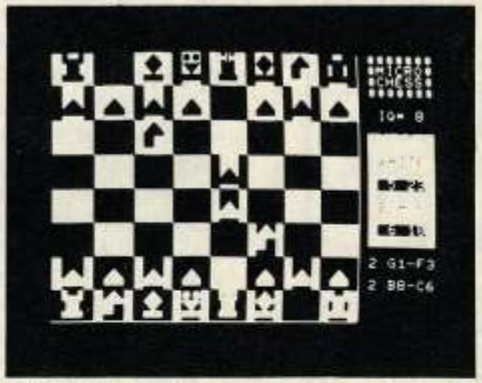
Photo from Sony color TV

Sup 'r' Mod II RF Interface

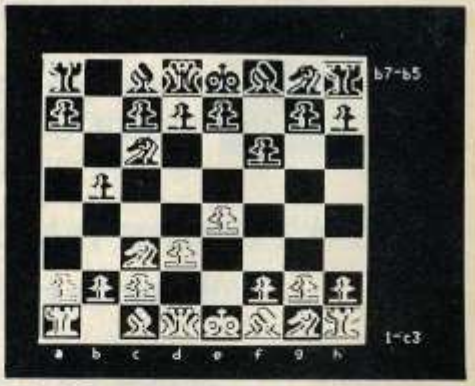
TRS-80



PET



APPLE



PLAY CHESS WITH YOUR COMPUTER!

MICROCHESS is the culmination of two years of chessplaying program development by **Peter Jennings**, author of the famous 1K byte chess program for the KIM-1. MICROCHESS 2.0 for 8K PETs and 16K APPLEs, in 6502 machine language, offers 8 levels of play to suit everyone from the beginner learning chess to the serious player. It examines positions as many as 6 moves ahead, and includes a chess clock for tournament play. MICROCHESS 1.5 for 4K TRS-80s, in Z-80 machine language, offers 3 levels of play (both Level I and Level II versions are included and can be loaded on any TRS-80 without TBUG). MICROCHESS checks every move for legality and displays the current position on a graphic chessboard. You can play White or Black, set up and play from special board positions, or even watch the computer play against itself! Available now at a special introductory price of only **$19.95**

BRIDGE CHALLENGER by **George Duisman** for 8K PETs, Level II 16K TRS-80s, and 16K APPLEs: You and the dummy play 4 person Contract Bridge against the computer. The program will deal hands at random or according to your criterion for high card points. You can review tricks, swap sides or replay hands when the cards are known. No longer do you need 4 people to play! **$14.95**

STIMULATING SIMULATIONS by **Dr. C.W. Engel** for 8K PETs, 4K Level I and II TRS-80s, and APPLEs with Applesoft II: Ten original simulation games such as Forest Fire, Lost Treasure, Gone Fishing and Diamond Thief, progressing from elementary to quite complex with most suitable for schoolchildren. Includes a 64 page book giving flowcharts, listings and suggested modifications ... **$14.95**

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P.O. Box 136-C11 **Personal Software™** Cambridge, MA 02138

CIRCLE 167 ON READER SERVICE CARD

VIDEO – better than Commodore or Tandy?

- The second 1K block of memory is shared by the processor (during phase 2 of the clock) and the display (during phase 1 of the clock, when it is also refreshing every dynamic RAM chip on the board) . [Super fast!]

Options for video:

- 24 lines of 40 upper case characters
- 40 x 40 graphics in 15 colors plus four lines of text
- 40 x 48 graphics in 15 colors.
- Colors, point plotting and line plotting are also accessible from BASIC.
- With 8K memory available, you have high resolution 280 horizontal by-192 vertical graphics in four colors, or 32 fewer vertical lines with four lines of text at the bottom of the screen.

Panel Question

Apple:

What made the Apple Disk II the better choice in your opinion, between the three manufacturers' drive solutions? At the time was simplicity more important than performance and capacity?

- 1978 external 5¼-inch floppy disk drive, the Disk II, to replace cassettes.
- Disk II far simpler and lighter when compared to TRS 80 Expansion Unit or PET 2040 drive.
- Visicalc spreadsheet program was key to penetration into business.
- Displacing PET as sales leader in schools
- Total Apple II sales from 1977-1981: 40,000

Panel Questions

Apple:

Why did the Apple make little or no design changes to its Apple II model long after the original PET 2001 and TRS 80 Model 1 were pulled from the market and replaced?

The first complete, low-cost microcomputer system for business, home or education

Radio Shack TRS-80

Includes CPU, memory, keyboard, display, power supply, cassette recorder

The computer that helps a small business think big — and grow bigger. The TRS-80 can greatly reduce the time you spend on payroll, accounting, inventory control and other clerical tasks. So you have more time for clients or customers. You don't have to be an expert in programming or electronics, because the TRS-80 is *not* a kit — it's wired, tested, U.L. listed, ready to use. The Z80-based system comes with 4K read/write memory and Radio Shack Level-I BASIC® stored in read-only memory. Memory expandable to 62K bytes. With programming instructions and ready for an expanding selection of prepared programs on cassettes. Designed and built in the USA by Radio Shack. Just 599.95!

Clip and Mail Coupon Today!

Mail to: Radio Shack, Dept. TRS-80
205 N.W. 7th St., Ft. Worth, TX 76101

Send me more data on the TRS-80 microcomputer

- **Description of applications, software and peripherals available through Radio Shack • Owners' newsletter**
- **Price list • List of stocking stores and dealers**

NAME _____ APT. NO. _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

SOLD ONLY WHERE YOU SEE THIS SIGN.

Radio Shack®

A TANDY COMPANY • FORT WORTH, TEXAS 76102
OVER 6000 LOCATIONS IN NINE COUNTRIES

Circle 120 on inquiry card.

Price may vary at individual stores and dealers

Byte ad,
Nov 1977

Radio Shack

TRS-80

- Introduced publicly in August 1977, complete systems from $599.
- Wired, tested, ready-to-use “appliance microcomputer”
- BASIC programming language pre-installed in ROM.
- Available at 5800 Radio Shack outlets, 50 service centers.
- Advanced Z-80 8-bit processor. Clock speed 1.78 Mhz.
- Invented by Steve Leininger and Don French

Radio Shack

TRS-80

- The top selling micro computer for period 1977-1979
- Over 250,000 units sold from August 1977 through January 1981.
- Spawned companies to produce thousands of software programs for the new “appliance computer” market
- Encouraged hardware innovations such as the Exatron Stringy Floppy, Percom Doubler, and PC clones such as the LNW 80
- Discontinued in January 1981 after failing new FCC standards.

Radio Shack's personal computer system? This ad just might make you a believer.

You can't beat the 4K system at $599

TRS-80 "Breakthru"
- TRS-80 microcomputer
- 12" video display
- Professional keyboard
- Power supply
- Cassette tape recorder
- 4K RAM, Level-I BASIC
- 232-page manual
- 2 game cassettes

...or the step-up 16K system at $899

TRS-80 "Sweet 16"
- Above, except includes 16K RAM

...or the fast 4K/printer system at $1198

TRS-80 "Educator"
- Above, except includes 4K RAM and screen printer

...or the Level-II 16K/printer/disk system at $2385

TRS-80 "Professional"
- Above, except includes 16K RAM, disk drive, expansion interface, and Level-II BASIC

So how are you gonna beat the system that does this much for this little? No way!

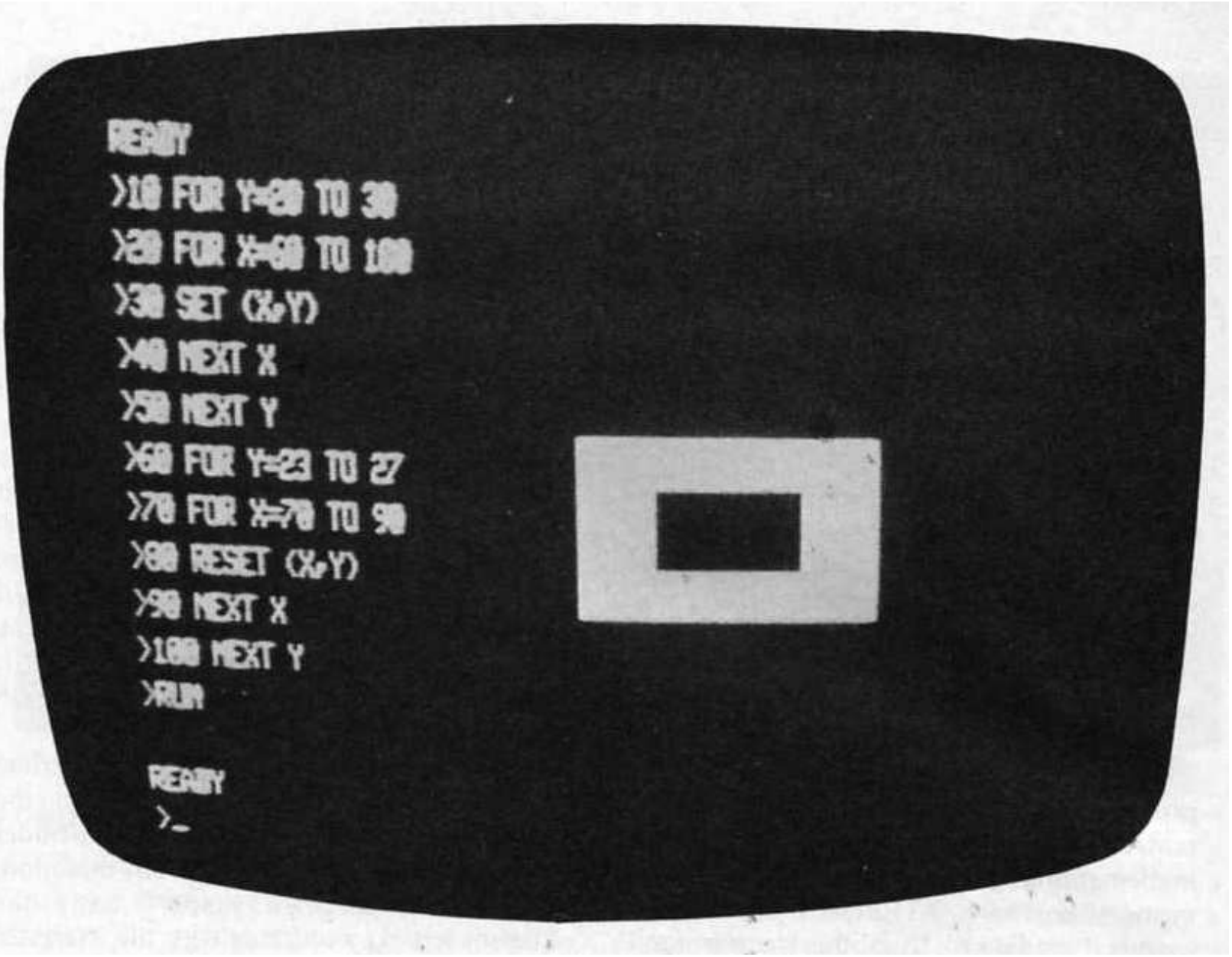
...The amazing new 32K/Level-II/2-disk/ line printer system at $3874

TRS-80 "Business"
- Above, except includes 32K RAM, line printer, and two disk drives

Get details and order now at Radio Shack stores and dealers in the USA, Canada, UK, Australia, Belgium, Holland, France, Japan. Write Radio Shack, Division of Tandy Corporation, Dept. C-096, 1400 One Tandy Center, Fort Worth, Texas 76102. Ask for Catalog TRS-80.

Radio Shack®
The biggest name in little computers™

Prices May Vary at Individual Stores and Dealers


READY
>10 FOR Y=20 TO 30
>20 FOR X=60 TO 100
>30 SET (X,Y)
>40 NEXT X
>50 NEXT Y
>60 FOR Y=23 TO 27
>70 FOR X=70 TO 90
>80 RESET (X,Y)
>90 NEXT X
>100 NEXT Y
>RUN
READY
>_

Panel Questions

Tandy:

Why did Radio Shack/Tandy install the Z80 processor in it’s TRS 80 Model 1?

Panel Question

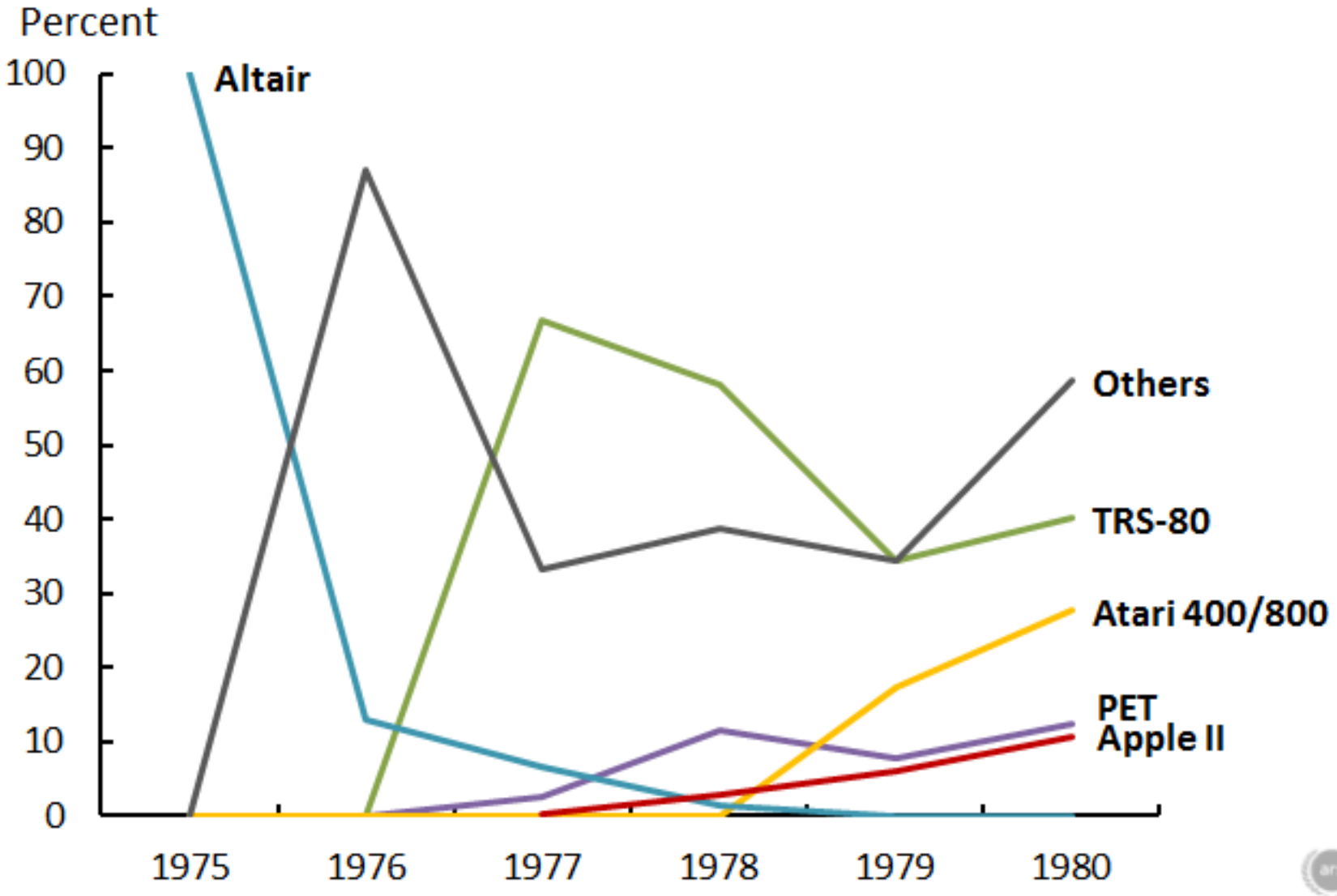
Tandy:

What were the most popular hobbyist magazines /publications read by Tandy owners in the late 70's?

Home Sales Expands Micro Market

- At first, personal computers were often actually for business use
- 1975 – 60%
- 1979 – 33%, 31% combo business/personal, 35% personal only.
- Market MUCH larger by 1979, most new owners made up of home/personal

Personal computer market share: 1975-1980



Arstechnica.com 8/2012