Vintage Computer Festival

Computer History Museum

August 6 & 7, 2016

Dave Jaffe

August 27, 2016

Agenda

1. My photos
2. Photos from TechRepublic
3. Video from CuriousMarc (9:56)

Program Guide

VINTAGE COMPUTER FESTIVAL
WEST XI

Aug.6-7,2016

HACKADAY

Hackaday is the world's largest collection of Open Hardware Projects. Come share and celebrate all the hardware hacks that keep vintage machines alive and in use.

Hackaday is a proud sponsor of Vintage Computer Festival West XI

HACKADAY.COM / HACKADAY.IO

Hello world! Welcome to the Vintage Computer Festival West XI. You're about to embark on a fantastic family-friendly adventure backward in time.

You will see and touch dozens of historic computers from many decades gone – everything from big iron to eight-bitters. You'll also experience some creative new replicas, modern enhancements, and new retro-themed systems. You will meet some historic people, learn their insider stories, and perhaps pick up our nerdily awesome t-shirt! While you're here, remember to tour the amazing museum all around us: they're a terrific host and worth a return trip.

Be sure to talk about us online: #vcfwest

Happy computing,

- The Vintage Computer Federation

Speaker schedule

Saturday

- 9:30 – Evan Koblentz: Welcome speech
- 10:00 – Bob Zeidman: Was Microsoft built from stolen goods? Forensic analysis of DOS & CP/M
- 11:00 – IBM 1401 live demonstration
- 12:00 – Evan Koblentz: Evolution of portables
- 1:30 – Paul Laughton: Mainframes to Micros
- 2:30 – DEC PDP-1 live demonstration
- 4:00 – Bruce Damer: Digital archaeology
- 5:00 – Kevin Savetz: Save our community's stories

Sunday

- 10:00 – Christine Finn: Motherboards and mother lodes: Evolving archeology of the digital age
- 11:00 – IBM 1401 live demonstration
- 11:30 – Sellam Ismail: Computer shenanigans!
- 1:00 – Early computer gaming panel: Al Alcorn, Steve Russell, and Don Woods
- 2:30 – DEC PDP-1 live demonstration
- 3:30 – Lee Felsenstein: Wisdom from a master: Why does vintage computing matter?
- 5:00 – Awards ceremony

Exhibitors

VCF exhibitors put amazing effort into displaying their favorite historic computing systems. Be sure to visit them all, ask questions, play, learn, Tweet, and take lots of pictures! Perhaps you'll be inspired to exhibit your own pride-and-joy at VCF West XII next year.

Museum of Art and Digital Entertainment: Oakland, CA

Microdata and DEC: Jim Stephens and Sherman Foy, Orange, CA

Southwest Technical Products: Michael Holley, Bothell, Washington

The Tomy Tutor Family: Cameron Kaiser, Rialto, CA

IBM 1130: Carl Claunch, Los Altos, CA

Early Sun Workstations & Ethernet: Robert Harker, San Mateo, CA

HP-85 and Peripherals: Marc Verdiell, Atherton, CA

Living Computer Museum: Stephen Jones, Seattle, Washington

Solid-State Monopoly Game: Stephen Casner, Sunnyvale, CA

(continues on the next page...)

> Seeing the early equipment at VCF is an amazing experience. It touches on all the hopes and dreams of the time and the many efforts to achieve what others thought would never happen. It brings back memories of a revolution in the making. The people you meet at the VCF are amazing.
>
> ***— Steve Wozniak, Apple***

Multics Reborn: Charles Anthony, Startup, Washington
Tim Jenison's Early Work: Tim Lindner, Concord, CA

Vintage Toys & Noise: Michael Hill, Daly City, CA

Rare Computers From Japan: Duncan Mac Dougall, Santa Clara, CA, and Mitch Zollinger, Los Gatos, CA

Life with Micros: David Henderson, Tempe, Arizona

Unique S-100 Boards: John Monahan, San Ramon, CA

DEC Spacewar!: Bob Rosenbloom, Santa Cruz, CA, and Lyle Bickley, Mountain View, CA

Modern Replicas: Oscar Vermeulen, Walchwil, Switzerland

MOnSter6502: Eric Schlaepfer, Sunnyvale, CA

AMI EVK 99: Larry Pezzolo, Palo Alto, CA

Differential Analyzer: Tim Robinson, Boulder Creek, CA

(continues on the next page...)

In 35 years the personal computer grew from nothing into the most important device shaping everyday life. It should be part of everyone's education to see how it grew and to learn from the people who grew it in ways they wanted to see it grow. VCF is the place to be where not only the equipment can be seen and tried out but, perhaps more importantly, where the people who rose to the challenge offered by these machines can be met and heard from."

– Lee Felsenstein, Homebrew Computer Club; Community Memory; Processor Technology; Osborne

IBM 5100, 5110, 5120: Wayne Smith, La Canada, CA

The BIGBIT Computer: Gene Falk, Cupertino, CA

Magic-1 HomebrewCPU: Bill Buzbee, Half Moon Bay, CA

"BMOW" Handmade Computers: Steve Chamberlin, Belmont, CA

Analog Computing: Dwight Elvey, San Jose, CA

TRS-80 Model I & Sargon II chess: Cale Erskine, Portola Valley, CA

Data General DG-One: Tom Wilson, Palo Alto, CA

The Amazing Amiga: The Amiga 30th Team

Adventure: Thomas Conrad, Morgan Hill, CA

Mechanical Arithmetic: Cliff Stoll, Oakland, CA

NorthStar S-100: Pavl Zachary, Mt. Hamilton, CA

As a speaker at the first Vintage Computer Festival, I have been delighted to see it grow and flourish. VCF is an important institution for computing history simply by getting everyone together for collecting, sharing, and trading all form of bits. Having a forum, gathering, and market for old stuff a.k.a. vintage computers and the software that made them live is an essential way to preserve and expand the history of computing — for some of us, the greatest invention.

— Gordon Bell, founder, Computer History Museum; DEC PDP-8 engineer

Vintage Computer Federation

Vintage Computer Federation Inc. (vcfed.org) is a 501(c)3 non-profit organization for and by computer history enthusiasts. We evolved in 2015 from the DNA of related groups.

In addition to Vintage Computer Festival West, we also own VCF East (New Jersey each spring) and we are working hard on creating more events.

We're big fans of online collaboration. We own Vintage Computer Forum, which is the hobby's largest discussion site. There are thousands of users worldwide to help you with whatever niche of vintage computing you prefer.

We also support in-person meetups through regional chapters. Our founding chapter in the U.S. Mid-Atlantic region has its own hands-on computer museum! We are actively incubating new chapters and partnering with existing local groups to join the Federation.

SWTPC 6800 COMPUTER SYSTEM

MP-A SYSTEM BOARD
MP-C CONTROL INTERFACE
SWTPC 6800 COMPUTER SYSTEM
MP-M 4K MEMORY
MP-I PARALLEL INTERFACE
SWTPC 6800

POPULAR ELECTRONICS
Southwest Technical Products
MP-T Timer
Southwest Technical Products
MP-A2 Microprocessor/System Board
Southwest Technical Products
MP-N Calculator
Personal Computing Company
ACI-33 Cassette Interface

MICROLAB

CAUTION

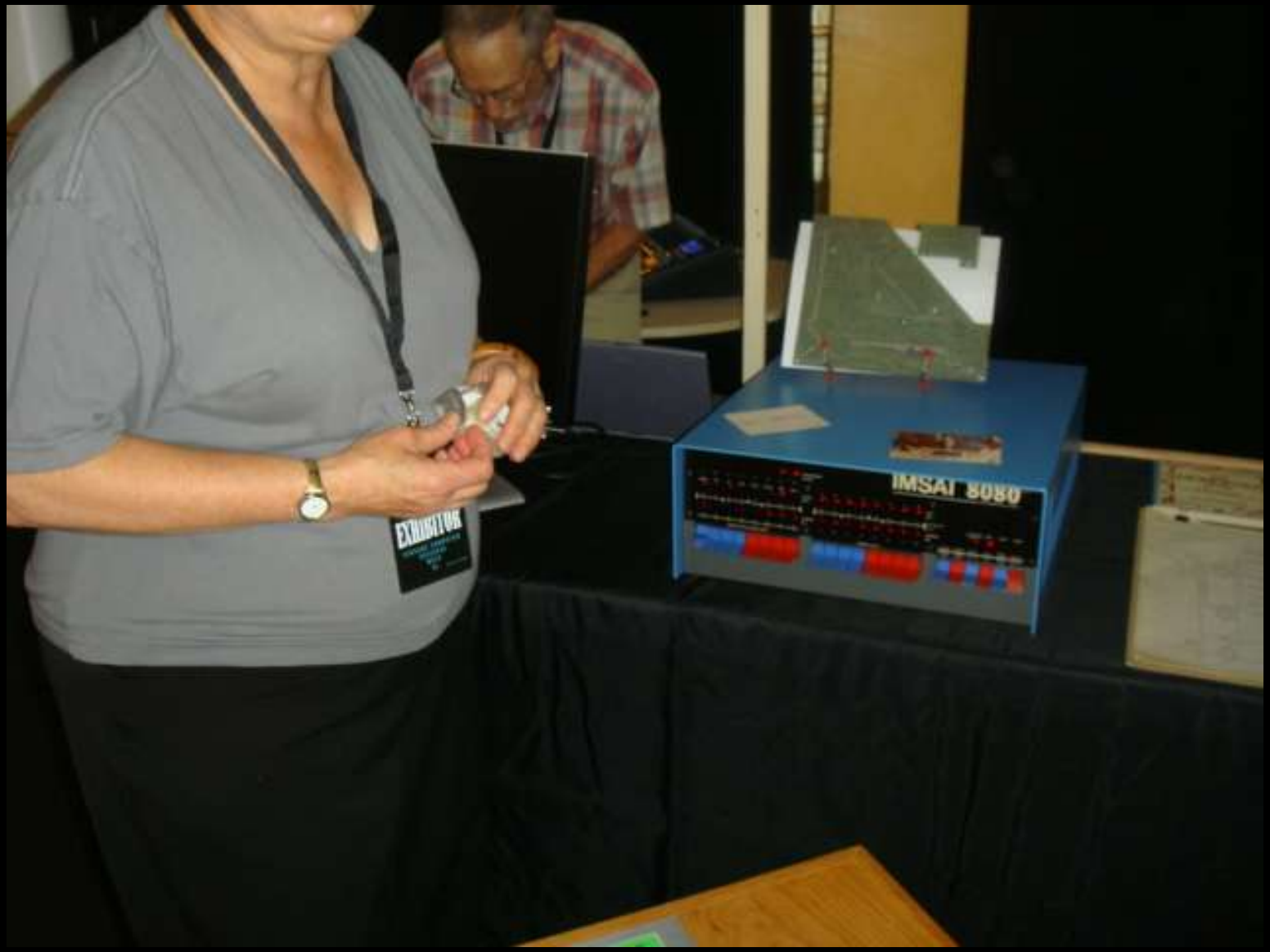
CAMION

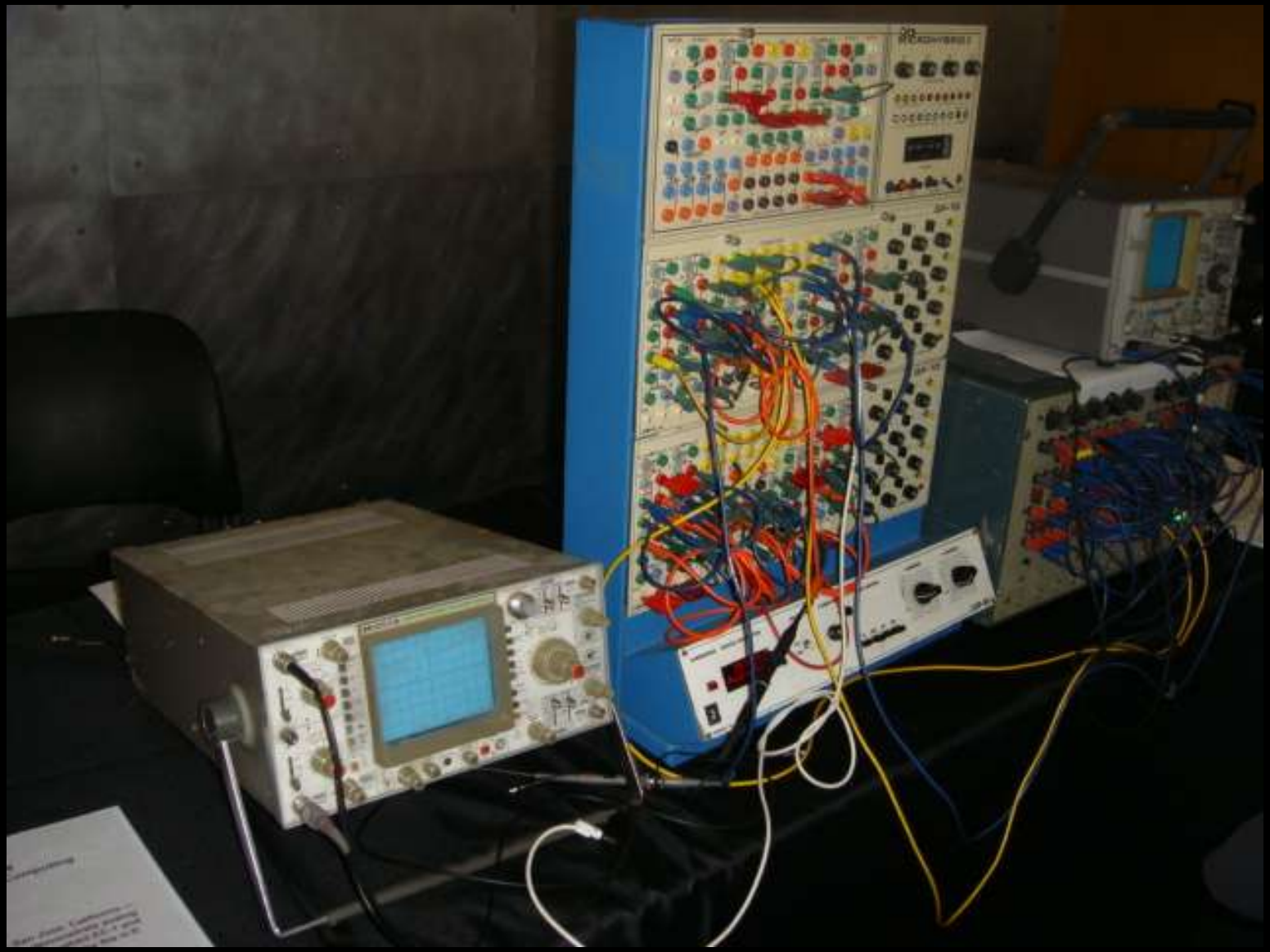
C/C COMPUTER CONTROL
pdpam

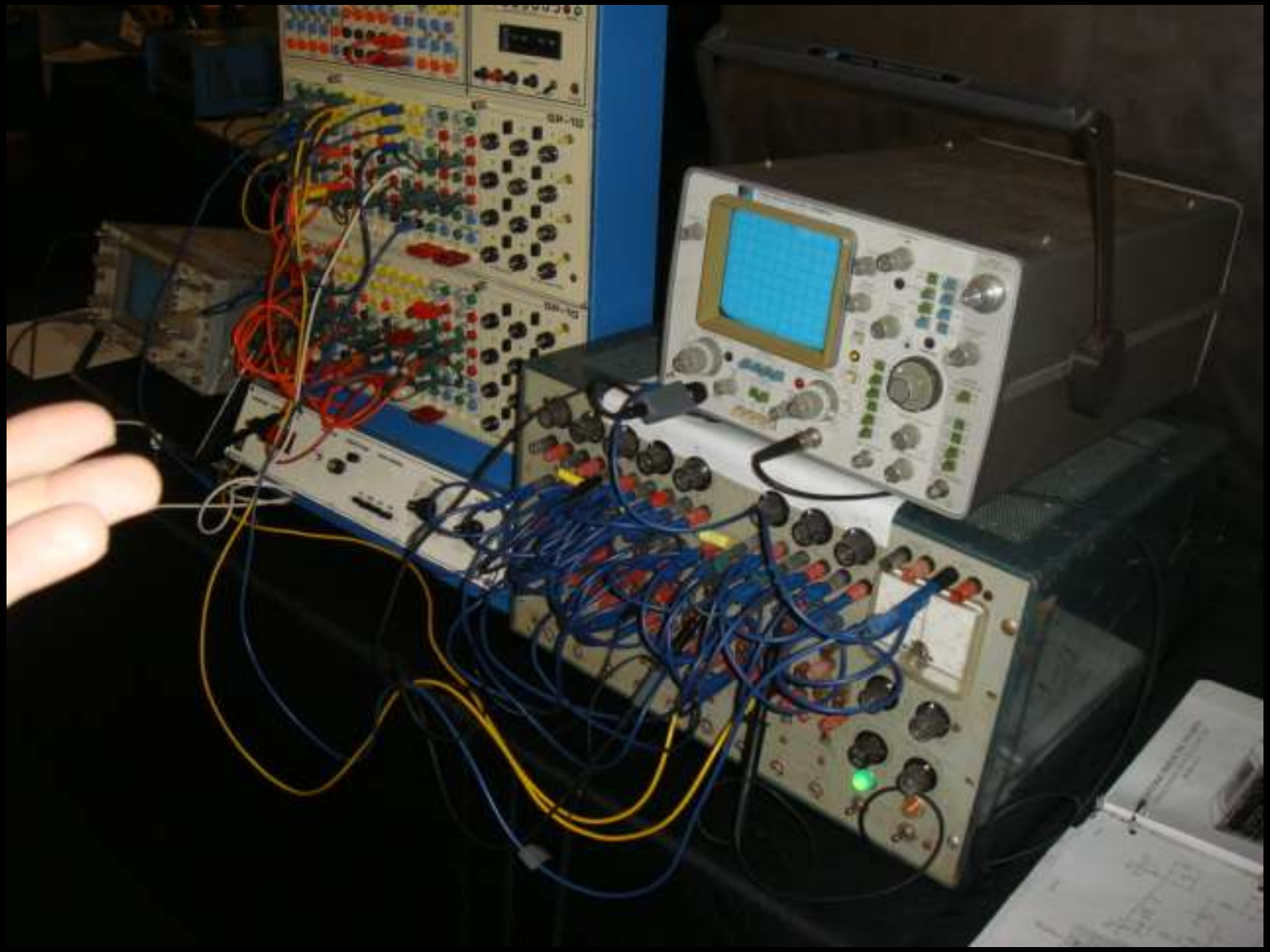
VINTAGE

PROTECTION
3 BASIC AREAS
Life
Health
Retirement

Try ThinkJet's
New
Quality Mode
Printing!!


IMSAI 8080





PET
PET
PERSONAL
COMPUTER

PET
PERSONAL
COMPUTER
GRAHAM CLUNN
VALERIE MORGAN

Irvine Computer Corporation

TOMY
TOMY TUTOR
DATA RECORDER
TOMY TUTOR
TRAFFIC JAM
Cameron Kaiser, Rialto, California —
The Tomy Tutor was an unusual com-
puter targeted at children. Based on the
Texas Instruments home computer

BASIC1
びゅう太
びゅう太 BASIC1

THE SUNDAY FREEMAN, KINGSTON, N.Y., SEPTEMBER 28, 1975

IBM Announces New Portable Computers

ATLANTA, Ga.

A new Portable Computer was announced today by International Business Machines Corporation.

The new IBM 5100 Portable Computer merges desk-top compactness with stand-alone computer functions to put problem-solving computer capabilities at the fingertips of the engineer, financial analyst, statistician, planner and many other professional problem solvers.

Weighing approximately 50 pounds, the 5100 — which is slightly larger than an IBM typewriter — can be readily moved from office to office. The computer requires standard 115-volt ac power, and can be used in most office, laboratory and manufacturing environments.

All 12 models of the IBM 5100 are available only on a purchase basis. Prices range from $8,975 to $19,975. First customer deliveries are scheduled for this month.

C. B. Rogers, Jr., IBM vice president and president of the General Systems Division, said "the new Portable Computer is designed to put data processing power within arm's length of today's problem solvers.

"The importance of that," he said, "is that we believe productivity gains can result through the proximity of computer power and through side-by-side man-machine interaction."

He said the IBM 5100 uses the newest IBM technology and represents a significant reduction in the entry size and cost of the company's data processing products.

In the late 1960s, a computer with this capacity and performance would have been nearly as large as two desks and would weigh about half a ton.

The General Systems Division, which develops and produces the IBM 5100, will also market and service it. "A special sales organization has been established," Rogers said, "to market the product nationwide."

In addition to serving the needs of the problem-solver in a stand-alone operation, an optional communications adapter allows the 5100 Portable Computer to communicate with a remote System/370 computer.

Two other desk-top input/output optional devices, the IBM 5103 printer and the IBM 5106 auxiliary tape unit, were also announced today for attachment to the 5100.

Three Problem Solver Libraries, contained in magnetic tape cartridges, are available for use with the IBM 5100, providing more than 100 interactive routines applicable to mathematical problems, statistical techniques and financial analyses.

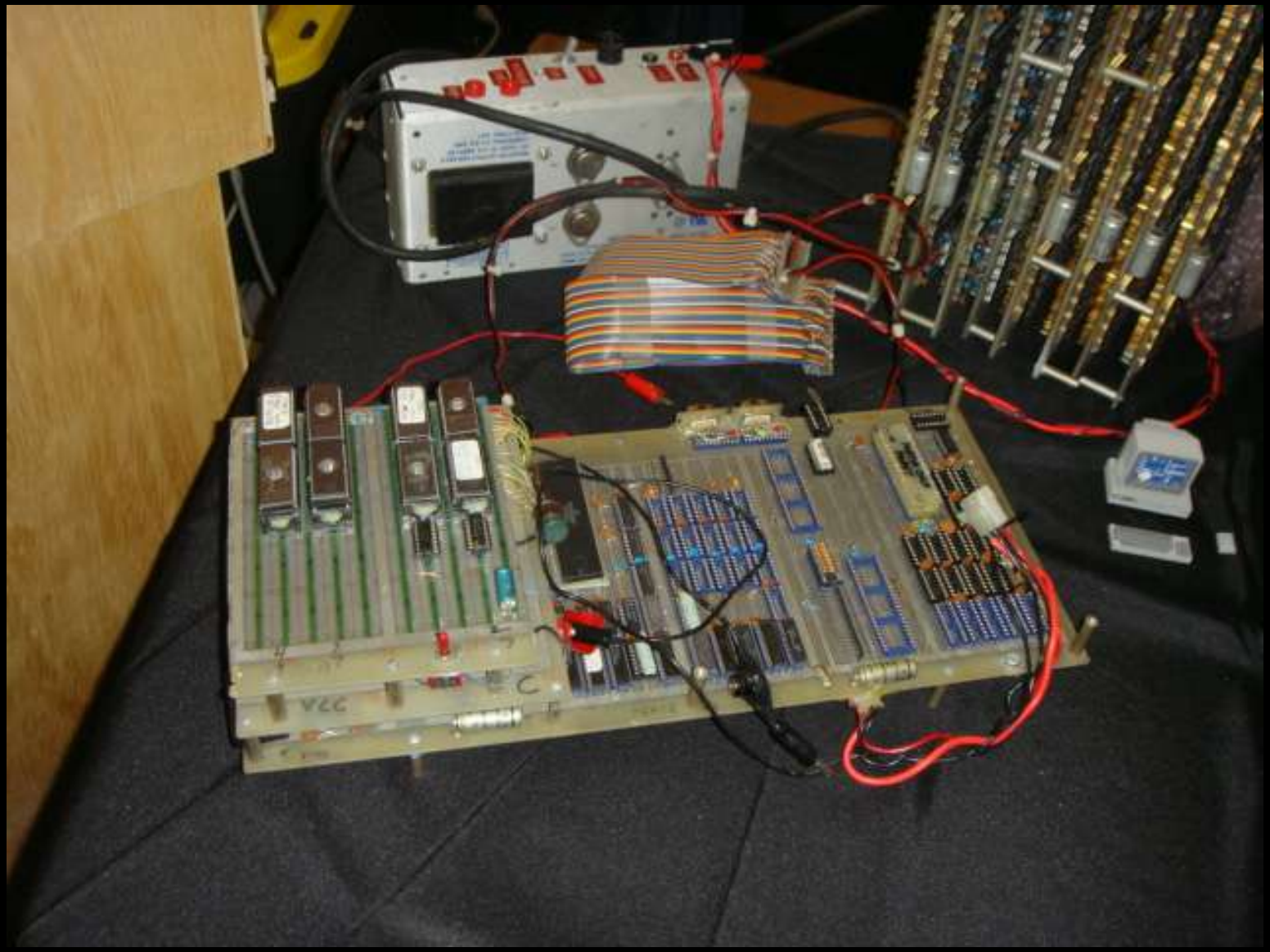
Models of the 5100 Portable Computer are available with either APL or BASIC or both programming languages. APL is a general purpose language capable of handling complex mathematical relations, tables or arrays. BASIC is an English-like, widely used language. Both are interactive programming languages that are easy to learn and can be used in any problem-solving environment such as business, mathematics and engineering.

Using New Portable Unit

Mathematical programs

Scotch DC 300A data cartridge

AmigaOS 4.1



2nd Annual
Amiga Developers Conference

GILE FRAGILE

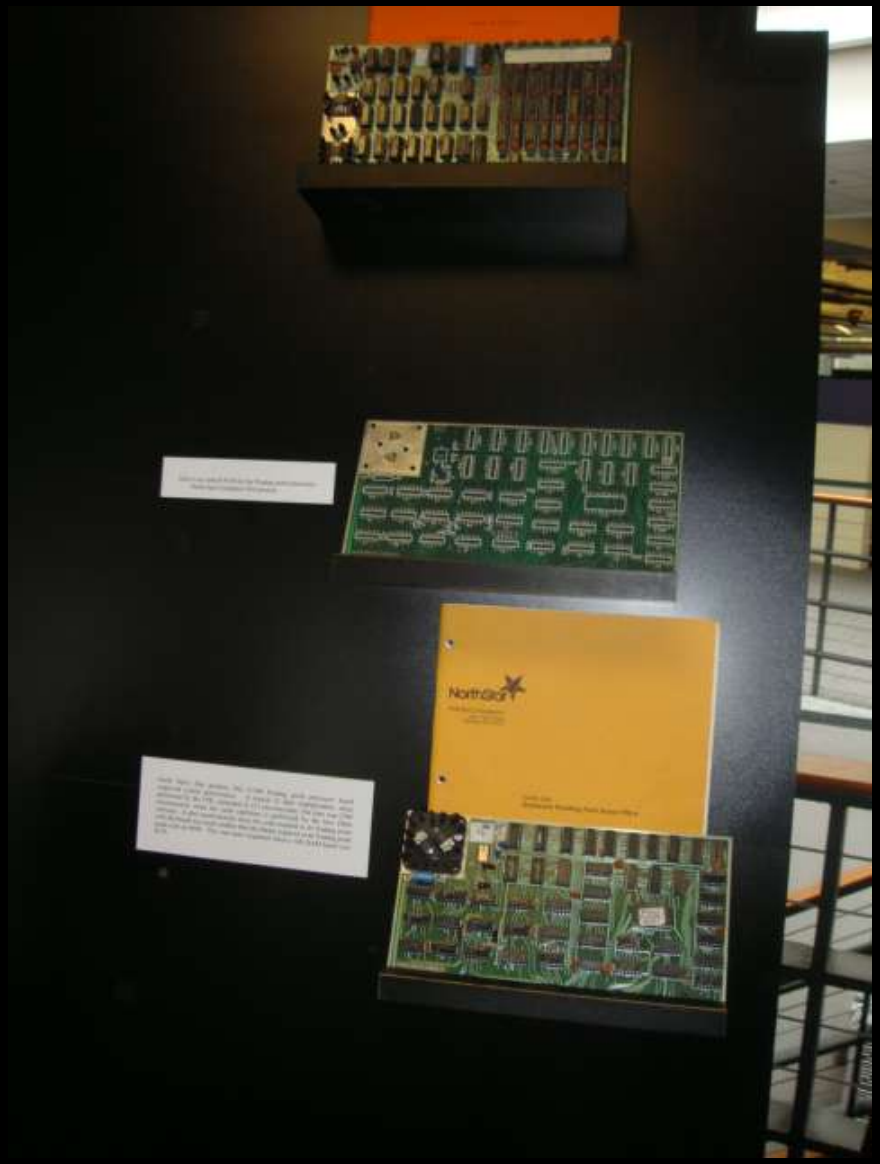
FRAGILE
pdp11/70
PiDP-11
1st Prototype "Medusa"
Open Source Hardware
Planned as a kit late 2016

PDP-8/I
PDP-8/I Replic
Open Source Hardware
Uses Raspberry Pi & Simh
Easy to build $145 kit
(or make your own!)

SMB
SMB's Technical Design

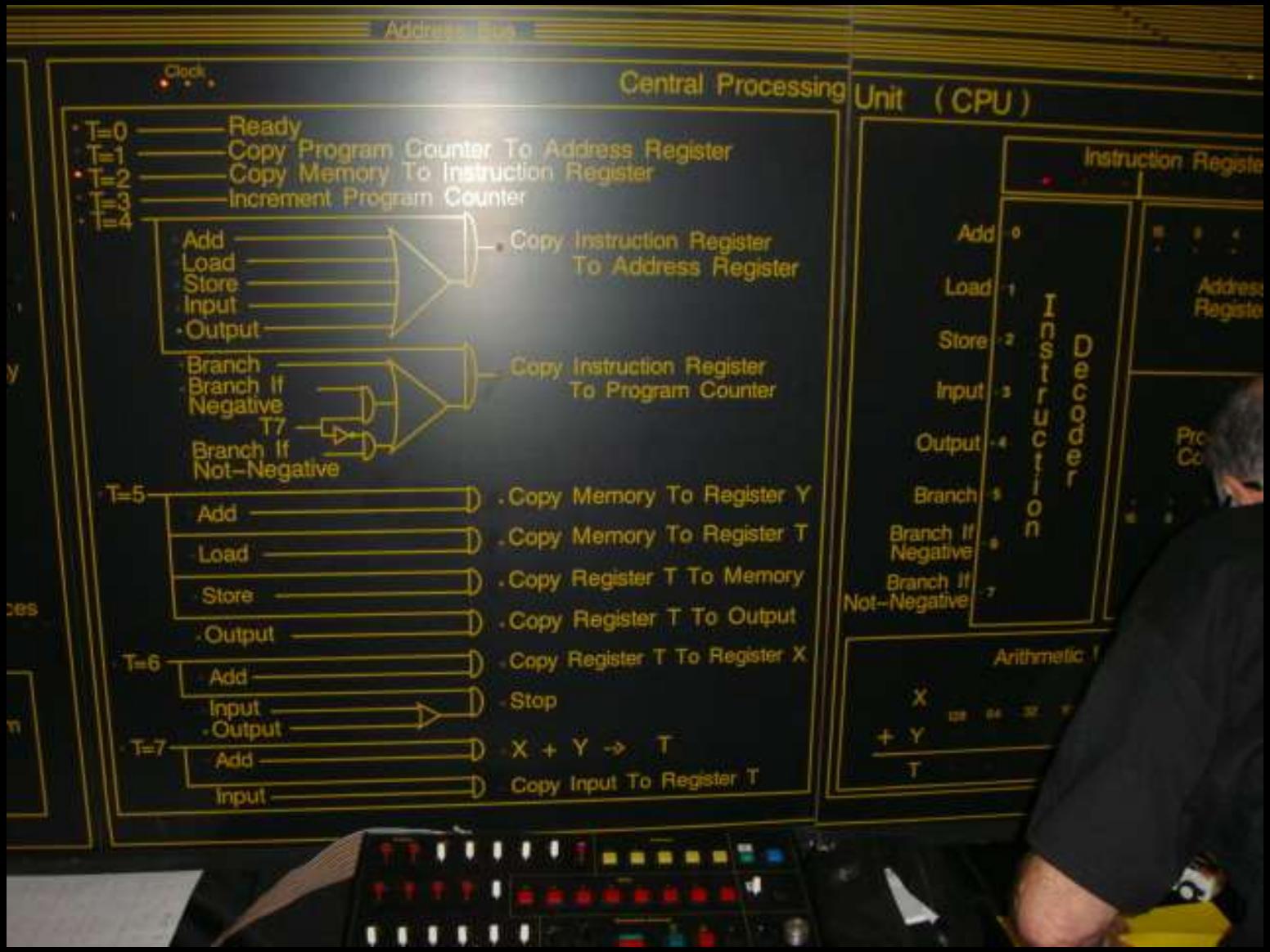
USING
CP/M
A SELF-TEACHING GUIDE
OSBORNE

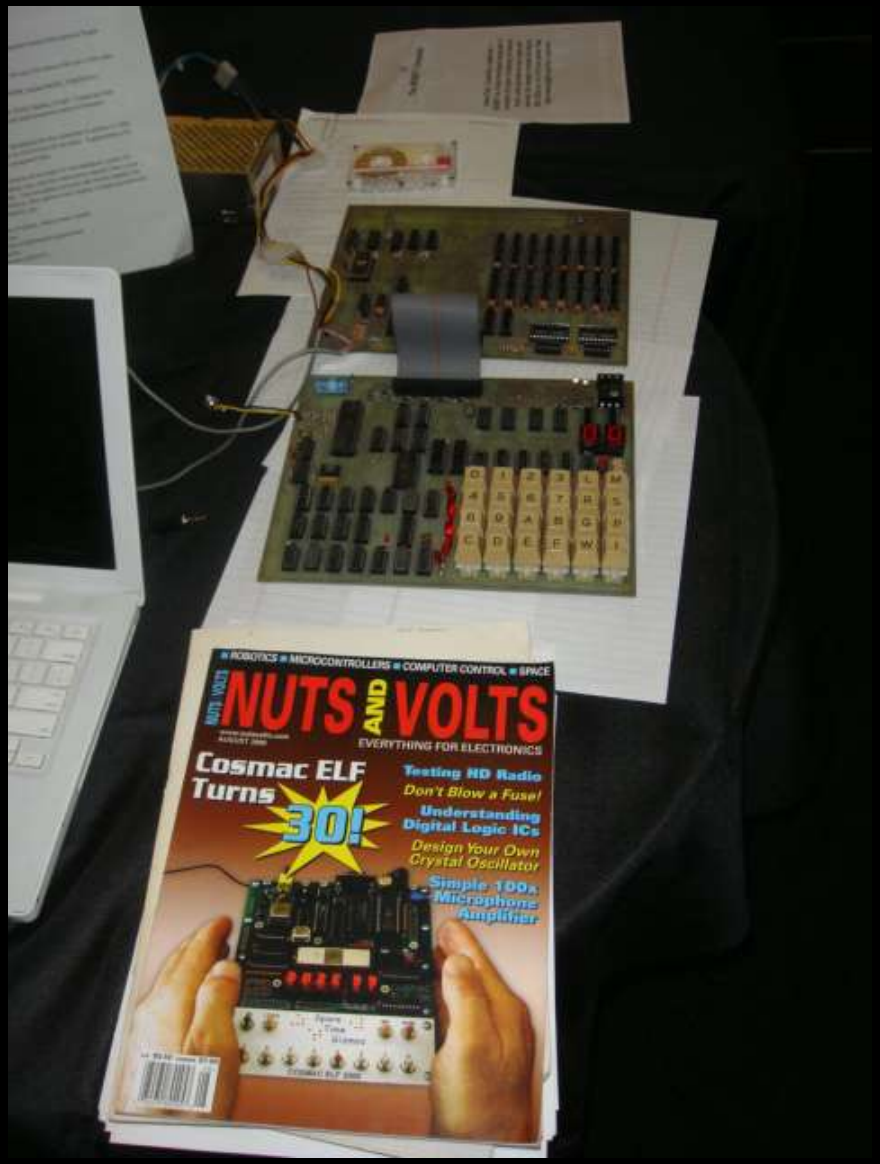
ADM-3A
Verbatim


Nortel

6502
IT'S OK TO TOUCH
Evil Mad Scientist

Peripheral Devices
Lights
0
Switches
1
2 Video Display
3 Keyboard
4 Printer
5 Misc. Devices
6
7
Disk
Modem
LAN
Tape
Data Bus
Address Bus
Clock
Central Processing Unit (CPU)
T=0 Ready
T=1 Copy Program Counter To Address Register
T=2 Copy Memory To Instruction Register
T=3 Increment Program Counter
Add
Load
Store
Input
Output
Copy Instruction Register To Address Register
Branch
Branch If Negative
T7
Branch If Not-Negative
Copy Instruction Register To Program Counter
T=5
Add
Load
Store
Output
Copy Memory To Register Y
Copy Memory To Register T
Copy Register T To Memory
Copy Register T To Output
Copy Register T To Register X
T=6
Add
Input
Output
T=7
Add
Input
Stop


Address Bus
Clock
Central Processing Unit (CPU)
T=0 Ready
T=1 Copy Program Counter To Address Register
T=2 Copy Memory To Instruction Register
T=3 Increment Program Counter
T=4
Add
Load
Store
Input
Output
Copy Instruction Register To Address Register
Branch
Branch If Negative
T7
Branch If Not-Negative
Copy Instruction Register To Program Counter
T=5
Add
Load
Store
Output
Copy Memory To Register Y
Copy Memory To Register T
Copy Register T To Memory
Copy Register T To Output
T=6
Add
Input
Output
Copy Register T To Register X
Stop
T=7
Add
Input
X + Y -> T
Copy Input To Register T
Instruction Register
Instruction Decoder
Add
Load
Store
Input
Output
Branch
Branch If Negative
Branch If Not-Negative
Arithmetic
X
+ Y
T


ROBOTICS ■ MICROCONTROLLERS ■ COMPUTER CONTROL ■ SPACE
NUTS AND VOLTS
EVERYTHING FOR ELECTRONICS
Cosmac ELF Turns 30!
Testing HD Radio
Don't Blow a Fuse!
Understanding Digital Logic ICs
Design Your Own Crystal Oscillator
Simple 100x Microphone Amplifier

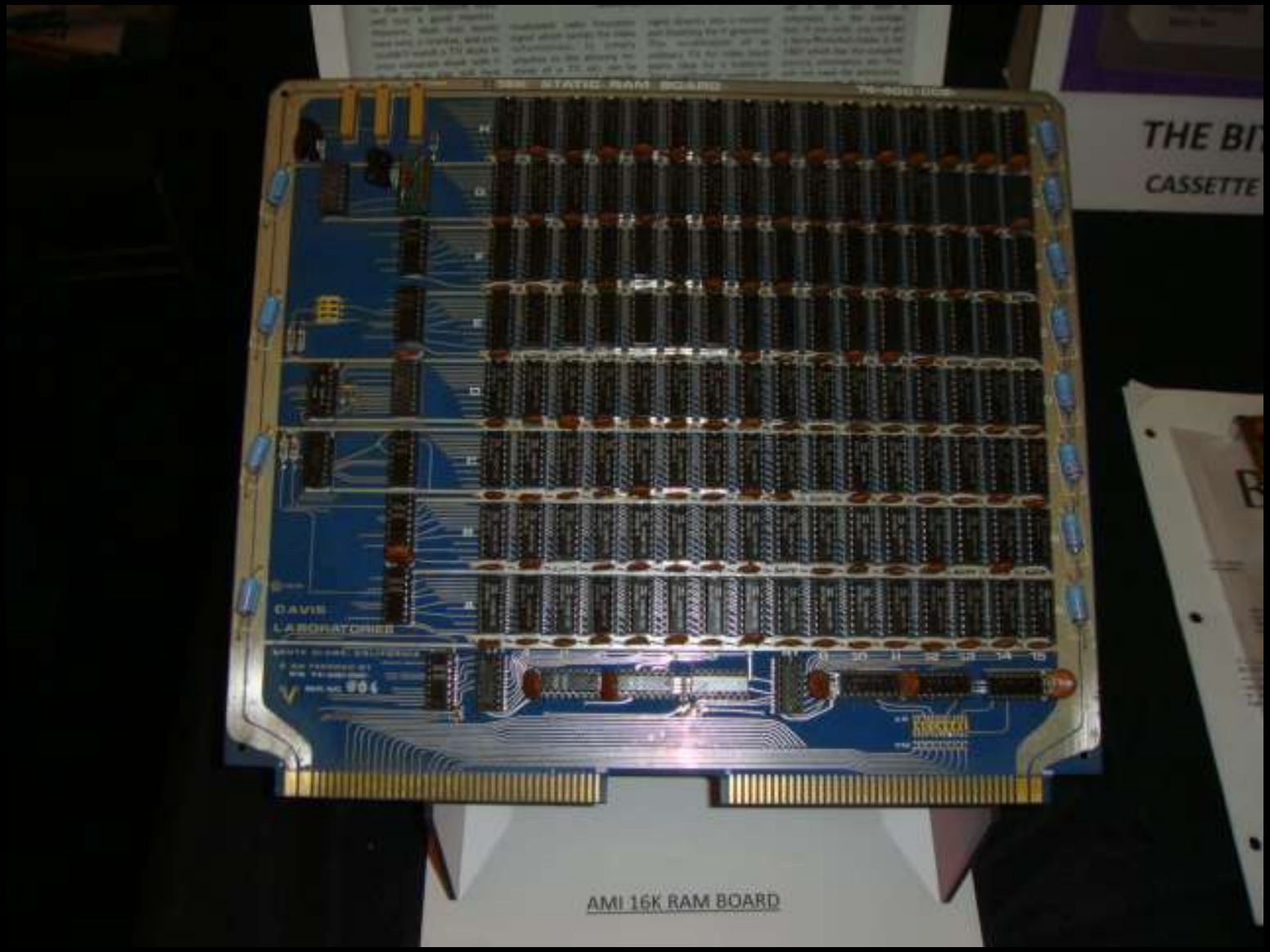
0 1 2 3 L M
4 5 6 7 R S
8 9 A B G P
C D E F W I

Jupiter
Jupiter ACE
4000
DELETE LINE
CAPS LOCK
INVERSE VIDEO
GRAPHICS
DELETE
ENTER
SHIFT
SYMBOL SHIFT
BREAK SPACE

СТР
ПЧ
П/Д
F0
СБР
ТАБ
ПС
ВК
СУ
ЗБ
НР
ВР
РУС
ЛАТ

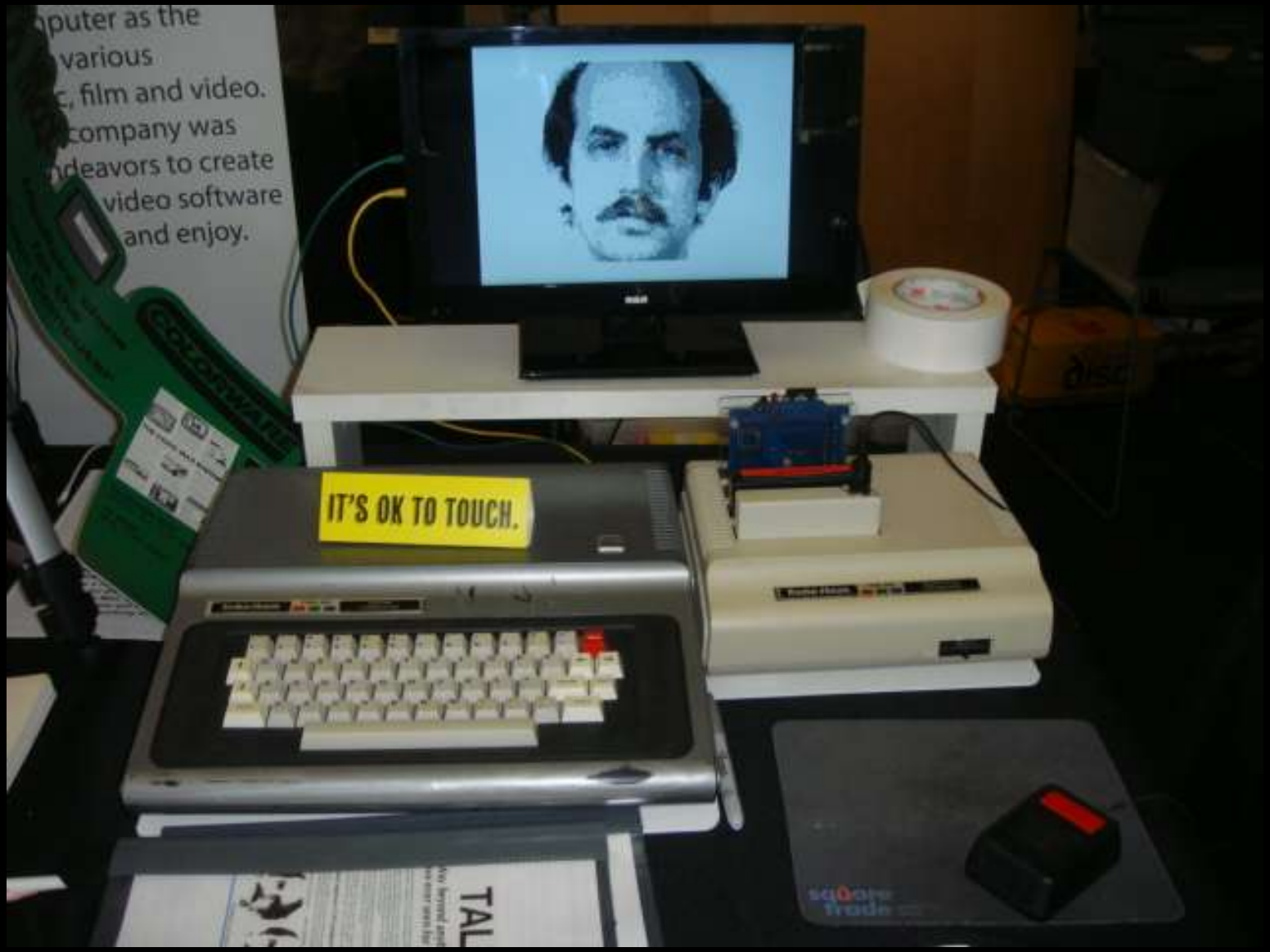
Russian-English
English-Russian
УСТРОЙСТВО
ИНФОРМАЦИОННО-
ВЫЧИСЛИТЕЛЬНОЕ
ПОВТ
БЛОК
РЕД
ВК
TAB
СУ
ЗАП
СТР
РУС
АР2
ПАР

AMI
PROTOBOARD
(EVK-99)
MANUALS



AMI 16K RAM BOARD

BIT


puter as the
various
, film and video.
company was
deavors to create
video software
and enjoy.
IT'S OK TO TOUCH.

For the Color Computer
the early
computers. By the
computer as the
his various
usic, film and video.
g a company was
endeavors to create
dable video software
uld use and enjoy.
IT'S OK TO TOUCH.

Magic-1 Schematics
Magic-1 Homebrew CPU

Magic-1 HomebrewCPU

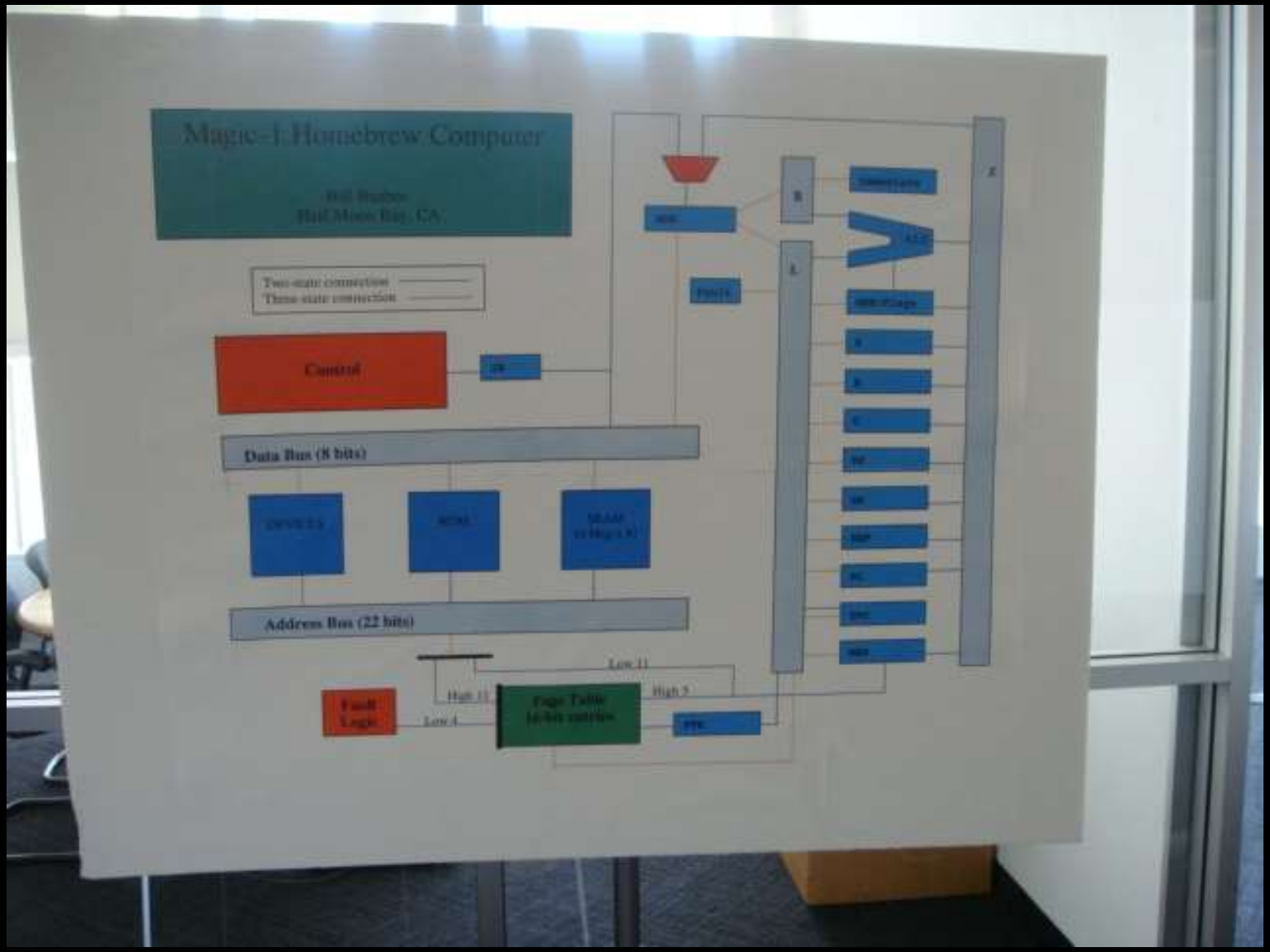
Magic-1 is a completely custom-designed and home-built computer. It was constructed largely using 1970's technology: 74 series TTL chips and wire-wrap. More than 200 TTL chips and roughly 5,000 individually wrapped wires were used. The design began in 2001, and the first test program succeeded in 2004. For the last 12 years, it's been running nearly continuously, connected to the internet serving web pages and hosting guest telnet sessions.

Hardware

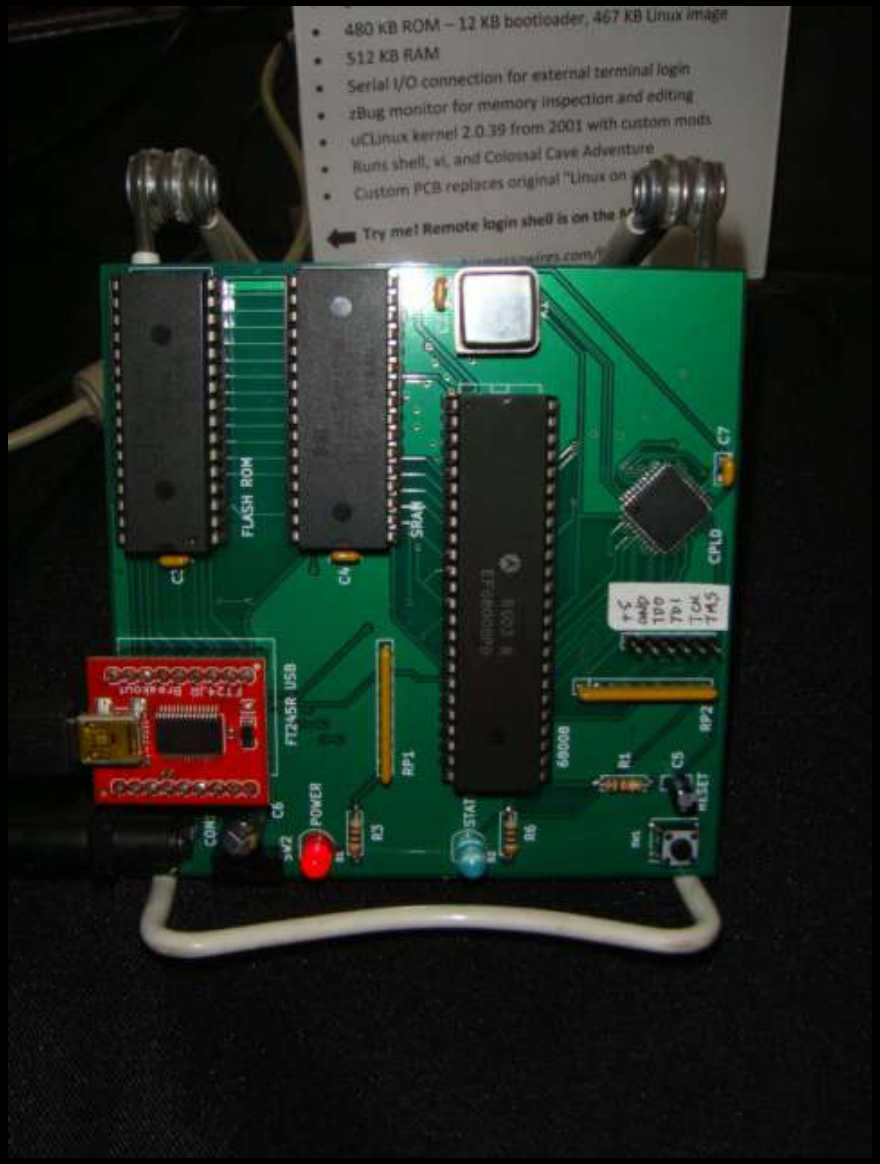
- Microcoded instruction set
- 4.09 Mhz clock
- 4 megabytes of SRAM
- ATA hard drive interface
- 2 serial ports
- User and kernel modes
- Memory Management Unit
- 23-bit address bus
- 8-bit data bus
- Full demand paging support
- 1 address architecture
- Addressing modes
  - Reg-Reg
  - Base + offset
  - Push, Pop
- Registers
  - General: A, B
  - Bases: SP, DP
  - Control: MSW, PTB
  - Special: PC, C

Software

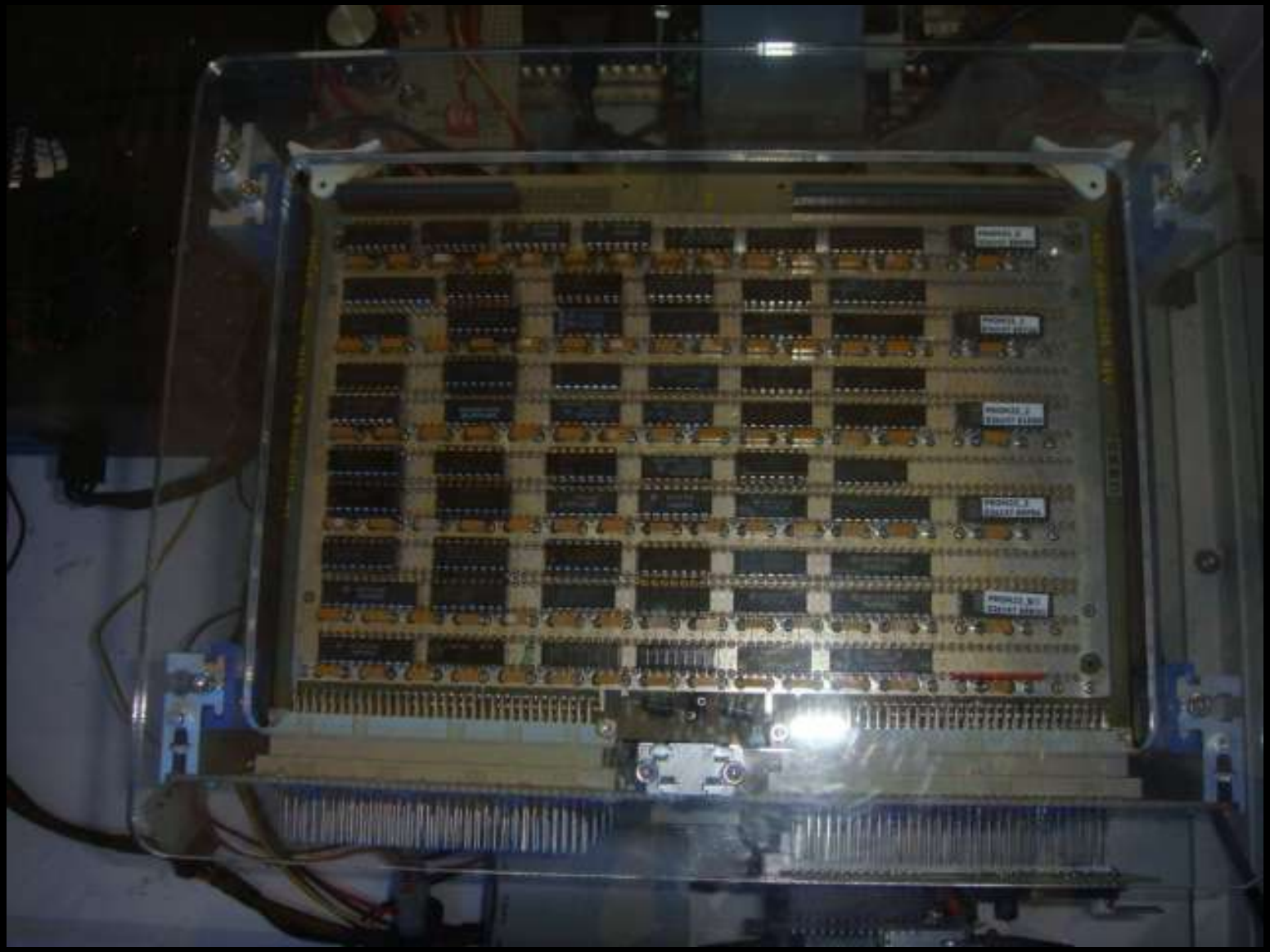
- Retargeted LCC ANSI C Compiler
- Custom assembler and linker
- Running a port of Minix 2.0 OS
  - Minix is a Unix-like OS
  - Fully multi-user and multi-tasking
  - Microkernel model
- Full TCP/IP stack
- SLIP Internet connection
- Hundreds of games and other programs
- Web and telnet servers


Magic-1 Homebrew Computer
Two-state connection
Three-state connection
Control
Data Bus (8 bits)
Address Bus (22 bits)
Fault Logic
Low 11
High 11
High 7
Low 4

Han9man
Press →_


480 KB ROM – 12 KB bootloader, 467 KB Linux image
512 KB RAM
Serial I/O connection for external terminal login
zBug monitor for memory inspection and editing
uCLinux kernel 2.0.39 from 2001 with custom mods
Runs shell, vi, and Colossal Cave Adventure
Custom PCB replaces original "Linux on
Try me! Remote login shell is on the
FLASH ROM
SRAM
CPLD
FT245R USB
RP1
RP2
POWER
STAT
6800B
C2
C4
C7
C5
C6
R1
R3
R6

uROM 2
uROM 1
BOOT ROM



Multics
Inside
MAINTENANCE
TEST

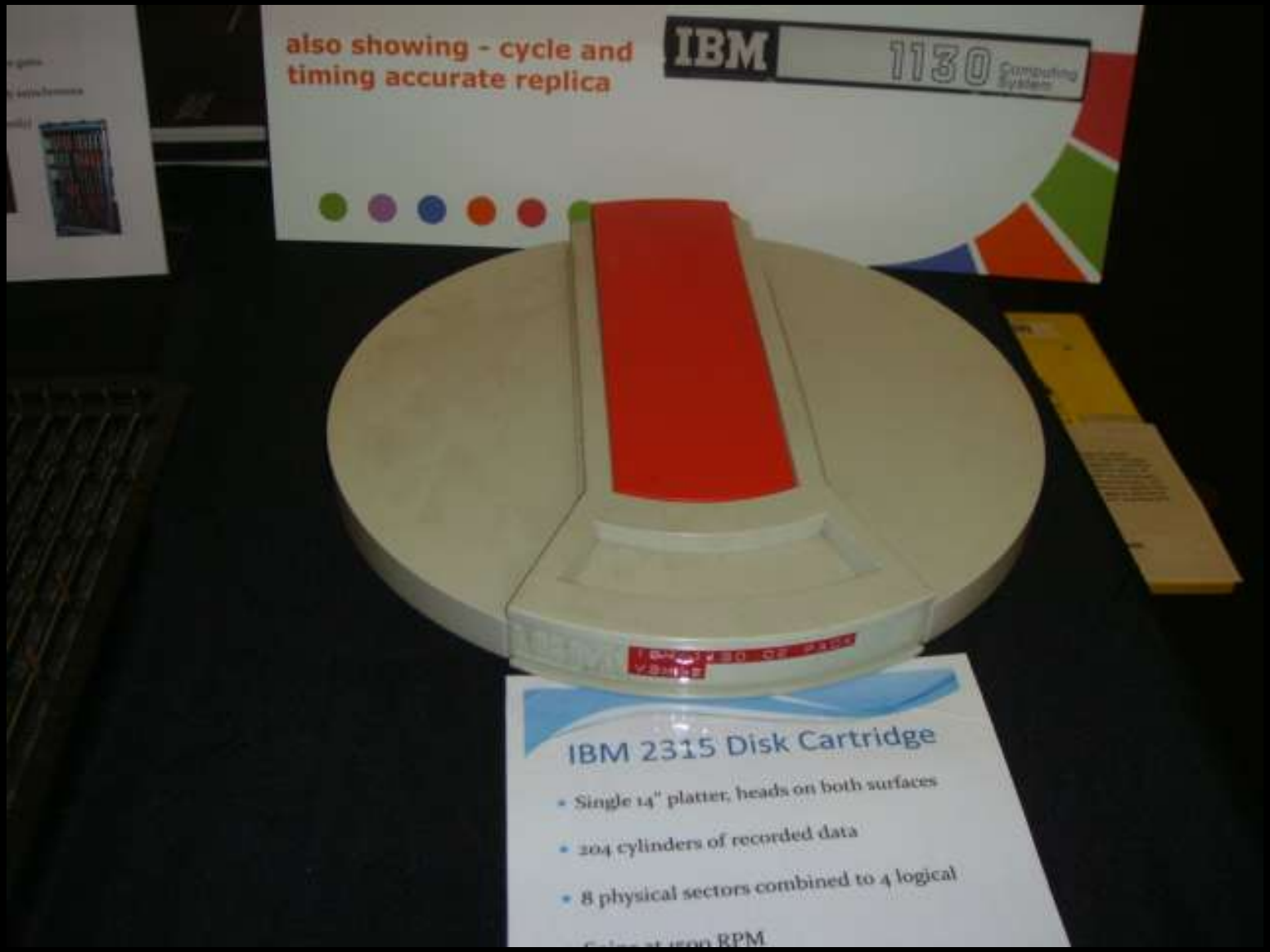
EXPERIMENTER
HANDBOO
It's Easy
To Build
POCKET
CALCUL
HEWLETT-PACKARD
HP-

SHARP X68000

GAME OVER
CREDIT 5
01000000
00856640
116

GAME OVER

CAVEMAN
GAMES


also showing - cycle and
timing accurate replica
IBM
1130
IBM 2315 Disk Cartridge
• Single 14" platter, heads on both surfaces
• 204 cylinders of recorded data
• 8 physical sectors combined to 4 logical

PROGRAM THE HP-85

rd's Personal Computer for Professionals.

HEATHKIT microcomputer learning system
MODEL 3400 SERIES
CPU
Data I/O
Control Buffers
Address Buffers
Binary Data
D E F
A B C
7 8 9
4 5 6
1 2 3
0

AC - 8
intel
C
D
E
F
8
9
A
B
4
5
6
7
0
1
2
3

AC-7
intel
C
D
E
F
8
9
A
B
4
5
6
7
0
1
2
3

DATA I/O
System 19
2732A
Gang Programming Module 24 Pin
DATA I/O
Master
Socket

commodore
PET
2001 Series
personal
computer

ZX81
PZ23

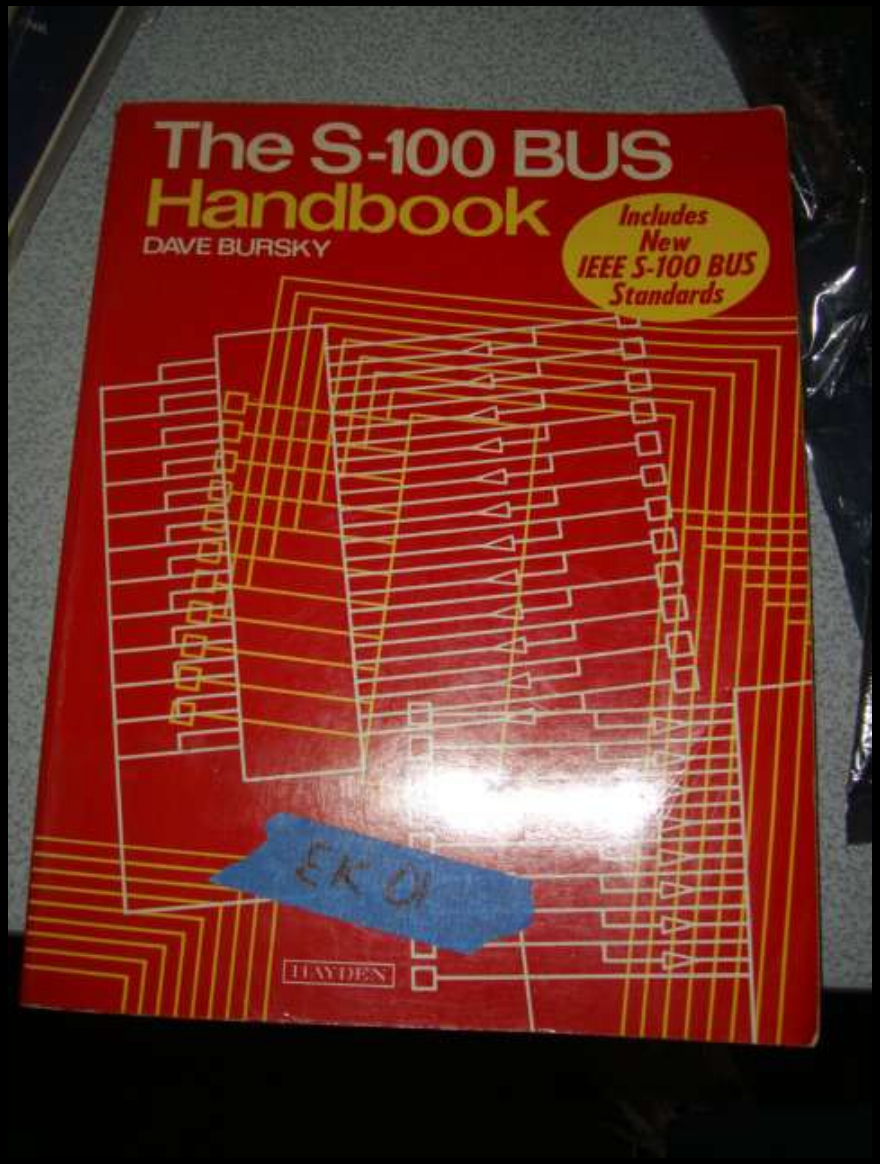
SONY
ROYAL
PZ4

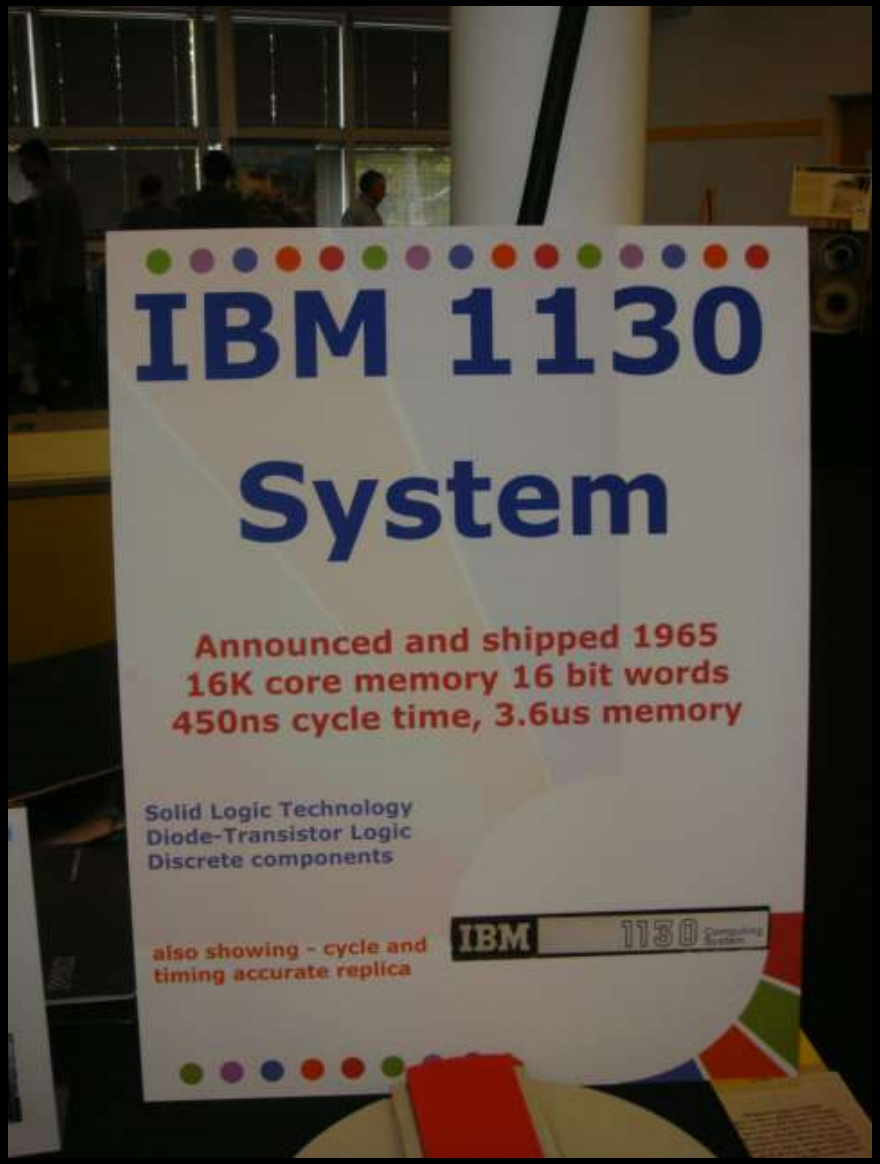
ATARISOFT PRESENTS
JUNGLE
HUNT
(C) 1982 TAITO
ALL RIGHTS RESERVED
(C) 1984 ATARI
PRESS SPACE BAR FOR OPTION SCREEN
IIc
PZ3

Zilog
OLYMPIA INTERNATIONAL
42000
commodore

POWER
KAYPRO II

Commodore
AMIGA 2000
AMIGA 2000HD


The S-100 BUS
Handbook
DAVE BURSKY
Includes
New
IEEE S-100 BUS
Standards
EKO
HAYDEN


IBM 1130
System
Announced and shipped 1965
16K core memory 16 bit words
450ns cycle time, 3.6us memory
Solid Logic Technology
Diode-Transistor Logic
Discrete components
also showing - cycle and
timing accurate replica
IBM 1130

IBM
1130

www.S100Computers.Com

This web site is setup for people who are interested in vintage S-100 bus based computers. These computers were the first home computers people used before IBM-PC, Apple etc. computers existed. These largely forgotten computers have now experienced a revival of in interest by hobbyists. There were about 20 major (and many minor) manufactures of these computers (see here) which made thousands of these computers. Many were supplied as "kits" which each user assembled. The common denominator of all these systems was that they were all designed around a board with an edge connector consisting of 100 connections. Multiple boards could be plugged into such a "S-100 bus". Different manufactures offered unique boards, but by-and-large they all worked together in an S-100 bus system. The S-100 bus was designed initially for 8 bit CPU's. It became very popular. It later evolved into a bus for 16 bit CPU's and finally was approved by the IEEE as the IEEE-696 bus.

This site describes many of the computer boards made for those systems. It also describes new S-100 boards being made today for people that would like to learn, experiment, and use the bus for various uses. There is a core group of users that purchase these boards as bare boards and build functional circuits with them themselves. These new boards are listed here.

Site Sections:-

Old S100 Boards & Manuals **History** **Software** **New S100 Boards** **Forum** **News**

Forum:- **Google Groups (S100Computers)**

https://groups.google.com/forum/?fromgroups#!forum/s100computers

S100 Bus 1976

8080 CPU

4K RAM

1K ROM

RS232 Serial I/O

S100 Bus 2016

8080, Z80, 6502, 68000, 8088, 8086

80286, 80386, 80486, (64bit, PDP11)

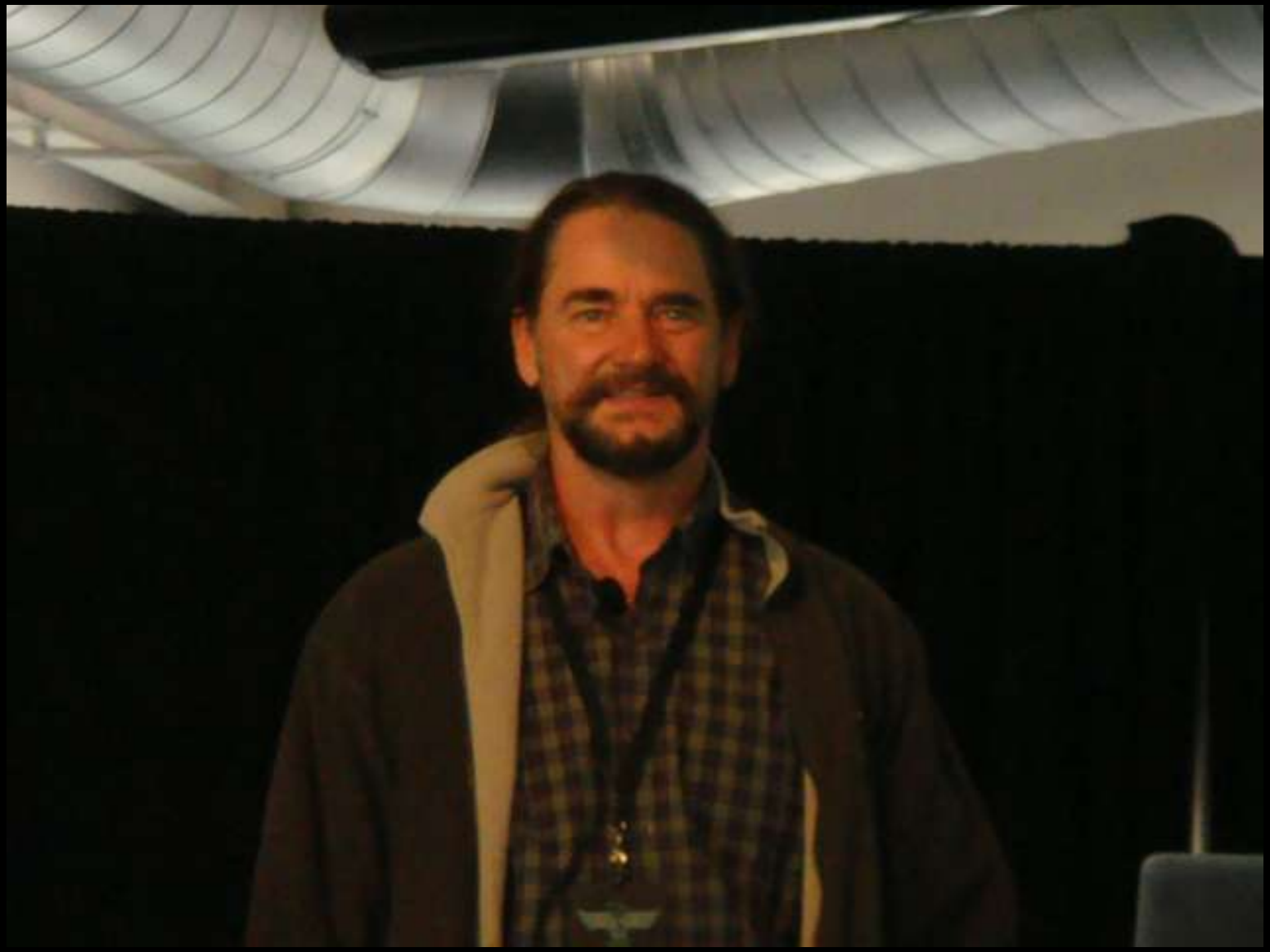
16 MB RAM (or up to 4GB)

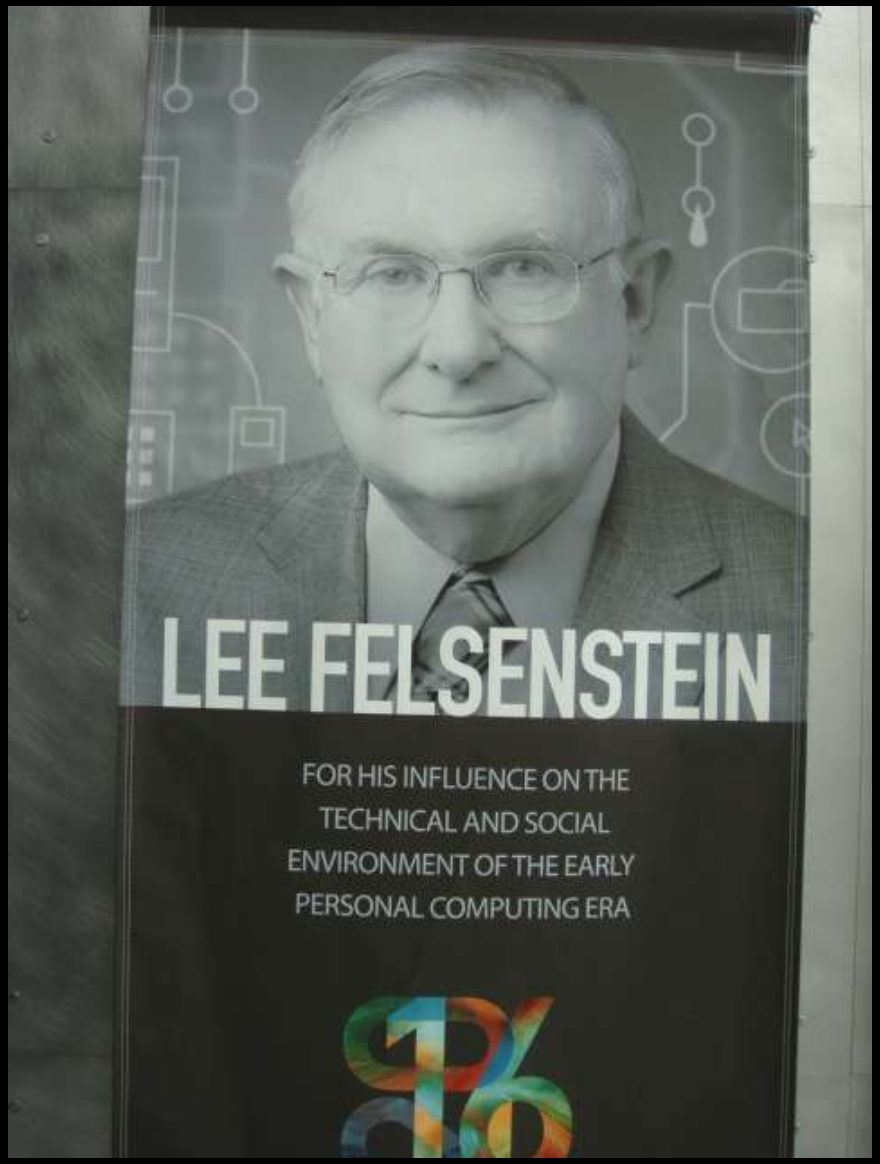
1MB ROM

Serial, Video (VGA), IBM PC keyboard

Speech Synthesis, Music synthesis

USB and (WiFi communications)




LEE FELSENSTEIN
FOR HIS INFLUENCE ON THE
TECHNICAL AND SOCIAL
ENVIRONMENT OF THE EARLY
PERSONAL COMPUTING ERA

DIGITAL EQUIPMENT CORPORATION
PDP-8

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1. Photos from TechRepublic
2. Video from CuriousMarc (9:56)
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