

CAVEATS:
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Unless otherwise stated, all computer programs are in assembly language.

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Hacker culture

The hacker culture values direct engagement with the computer and focuses on the nitty-gritty details of program execution. Hackers like to explore the limits of what a machine can do and pride themselves in individual skill, inventing clever tricks to push those limits.

Compiled with the hope that a record of the random things people do around here can save some duplication of effort -- except for fun.

page 1

Here is some little known data which may be of interest to computer hackers. The items and examples are so sketchy that to decipher them may require more sincerity and curiosity than a non-hacker can muster. Doubtless, little of this is new, but nowadays it's hard to tell. So we must be content to give you an insight, or save you some cycles, and to welcome further contributions of items, new or used.

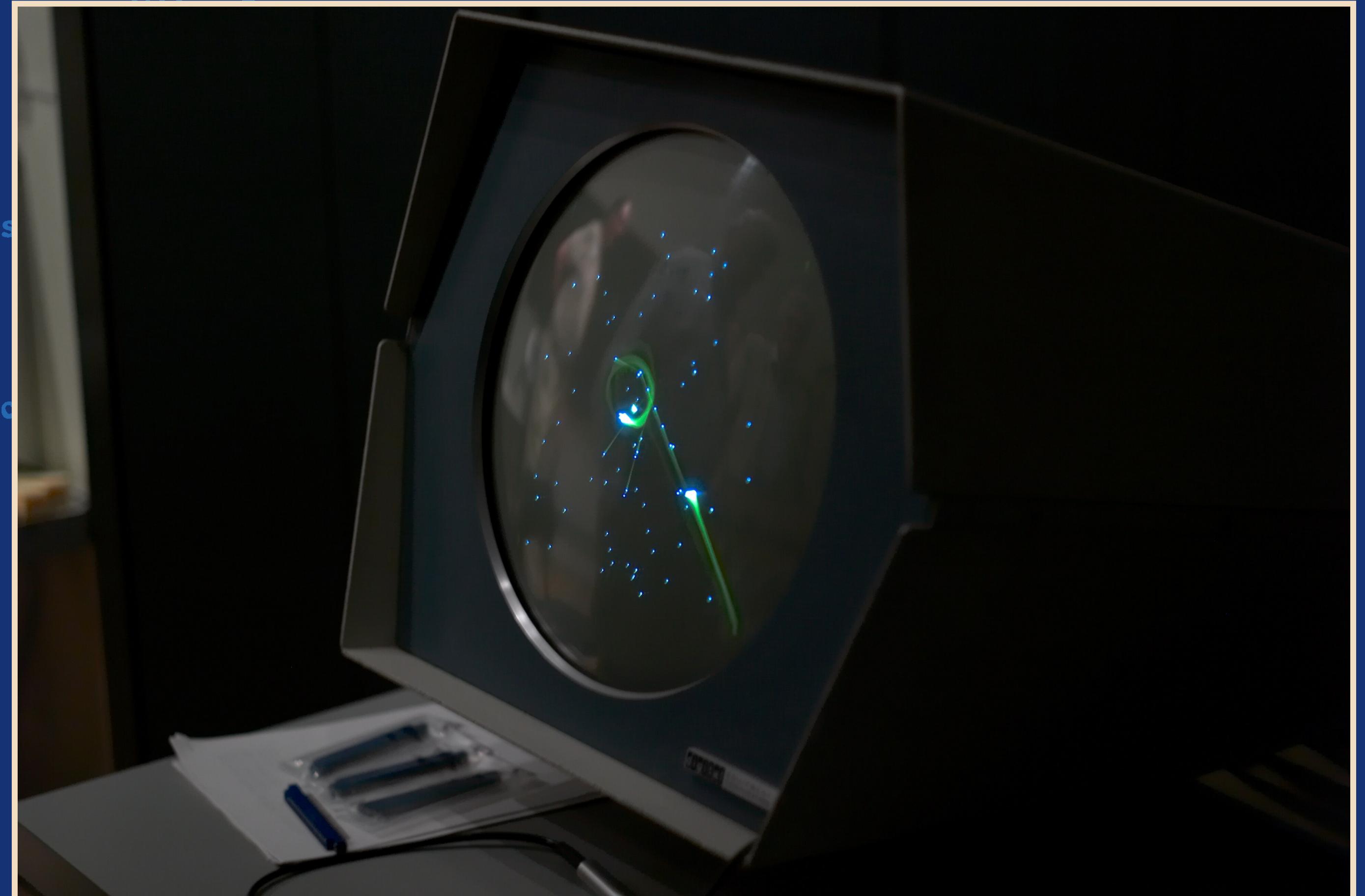
The classification of items into sections is even more illogical than necessary. This is because later elaborations tend to shift perspective on many items, and this elaboration will (hopefully) continue after publication, since this text is retained in "machinable" form. We forgive in advance anyone deterred by this wretched typography.

People referred to are

John Roe	Richard Stallman	Jerry Siegel
Michael Sperber	Gerald Sussman	David Waltz
Bill Groppe	Joe Cohen	David Silver
Peter Schroeppel	Stuart Nelson	Rollo Silver

once at the A. I. Lab but now elsewhere:

Jan Kok	William Henneman
Rici Liknaitzky	George Mitchell
Peter Samson	Stuart Nelson
Roger Banks	Rollo Silver



HAKMEM

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PUSHJ P..+1 is a nice way to have something happen twice. Other useful angle multiplying formulas are
 $\tanh X = (2 \tanh X/2) / (1 + (\tanh X/2)^2)$
 $\tan X = (2 \tan X/2) / (1 - (\tan X/2)^2)$, if infinity is handled correctly. For cos and cosh, one can use
 $\cos X = (\cosh X/2)^2 - (\sinh X/2)^2$.

Inventing interactive programming

The TX-0 computer was built in 1956. The control panel included Toggle Switch Storage for setting sixteen 18-bit registers, a 12 1/2" CRT screen and a teletype terminal.

TX-0 was available for interactive use, attracting MIT hackers who built the first on-line debugging tool, letting them view and change the state of a running program.

NUMBER THEORY, PRIMES, PROBABILITY

Just having fun

ITEM 28 (Schroepell):

After a few seconds of computation, the TX-0 was able to factor any non-prime number less than 256 into its prime factors in 31 seconds run time as follows:

John Brillhart at the University of Arizona had already done this. M137 was factored on Friday, July 9, 1971 in about 30 seconds.

32032 2159 6496 35589 54 39042 19360 0 42 51559.

Squeezing a realistic star map and gravity into 4k 18-bit words required ingenuity—spaceship rendering even used a kind of just-in-time compilation.

ITEM 29 (PDP-1):
For a random number, the probability of its largest prime factor being 2 is about 4.86%. This suggests that similar probabilities are independent of X; for instance, the probability that the largest prime factor of X is less than $2\sqrt{X}$ may be a fraction independent of the size of X.
RELEVANT DATA:
([]) denote the expected value of adjacent entries.)

