

computational thinking

2011-09-19

informatics literacy

Michael Fourman
Johanna Moore

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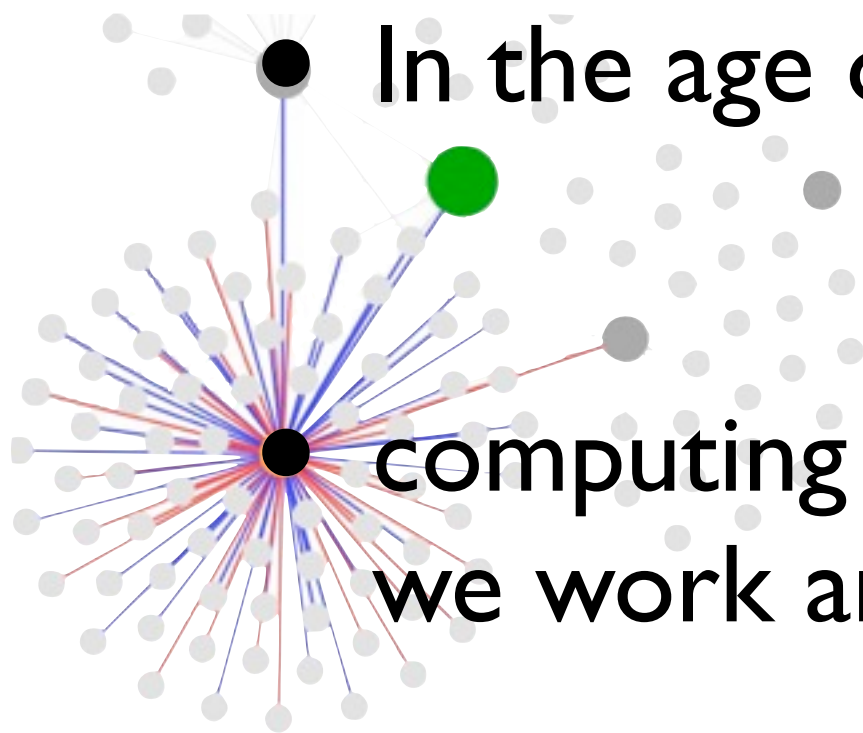


Tuesday, 6 December 11

Individualised letters – hand-crafted
 Mass production – printing
 Sensing and reproduction
 Sampling – 24 frames per second

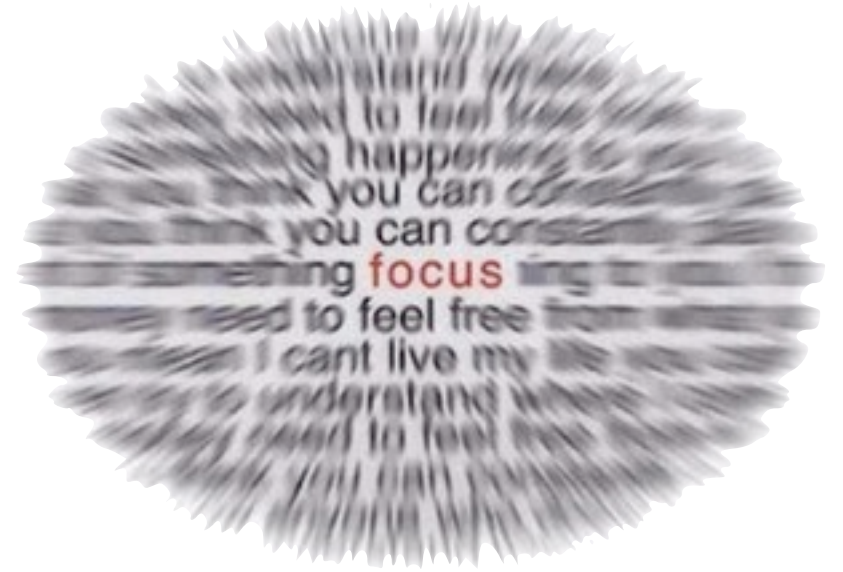


the changing world



In the age of information,

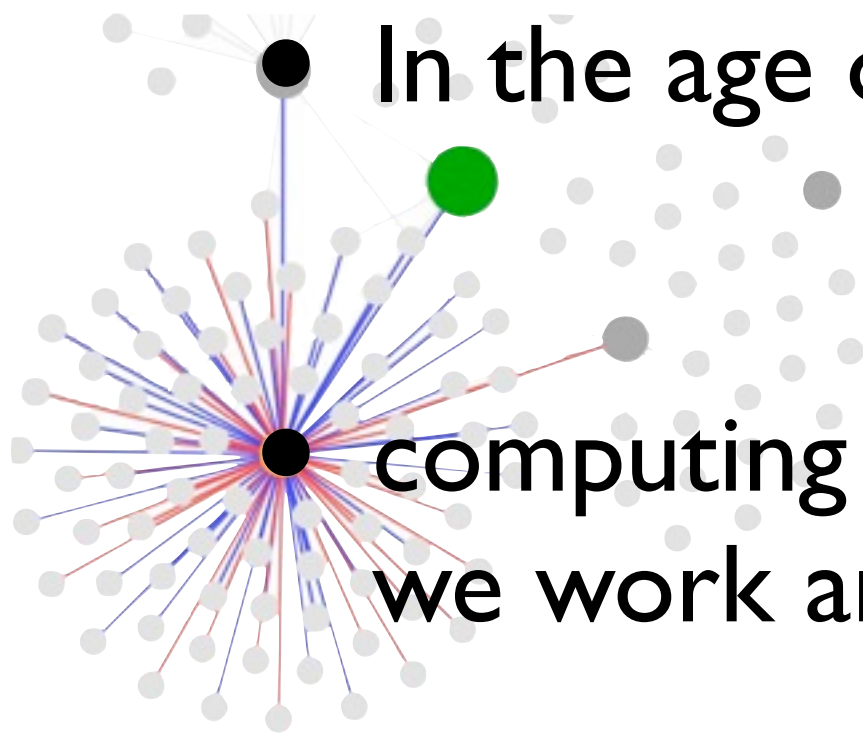
computing technology is changing the ways
we work and play;



Informatics is changing the ways we think.

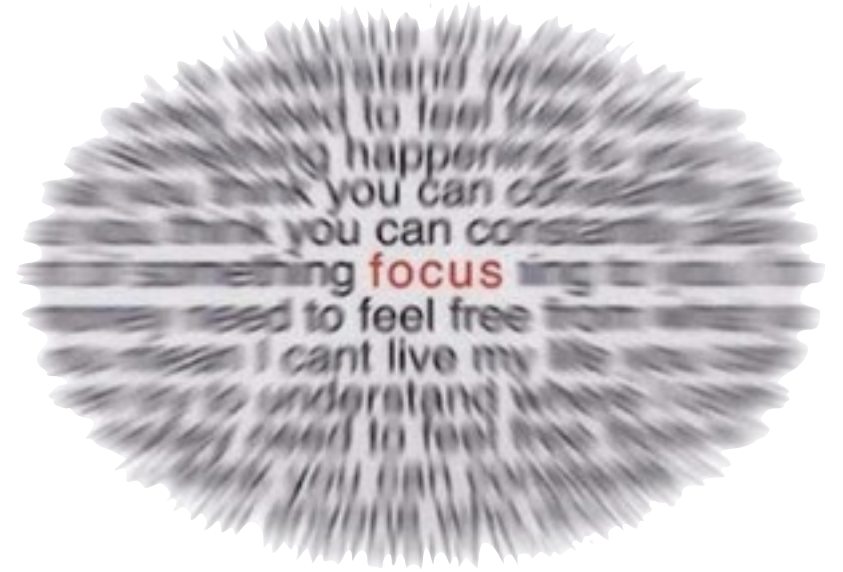


changing the world

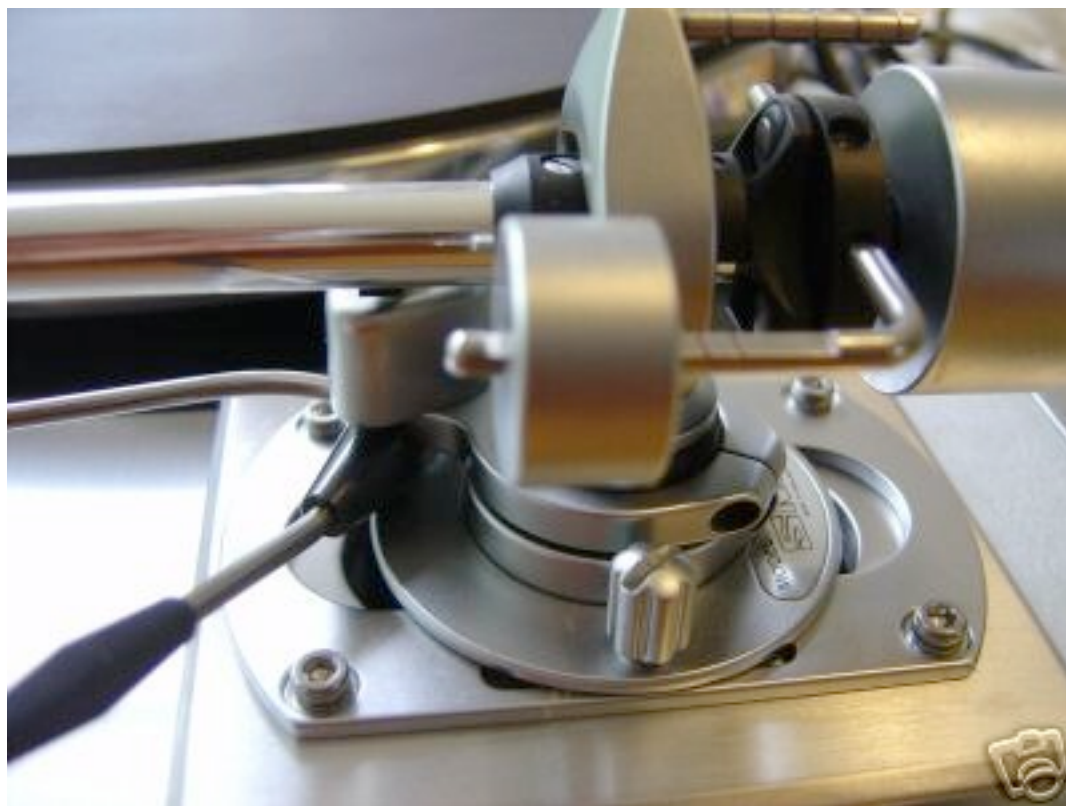


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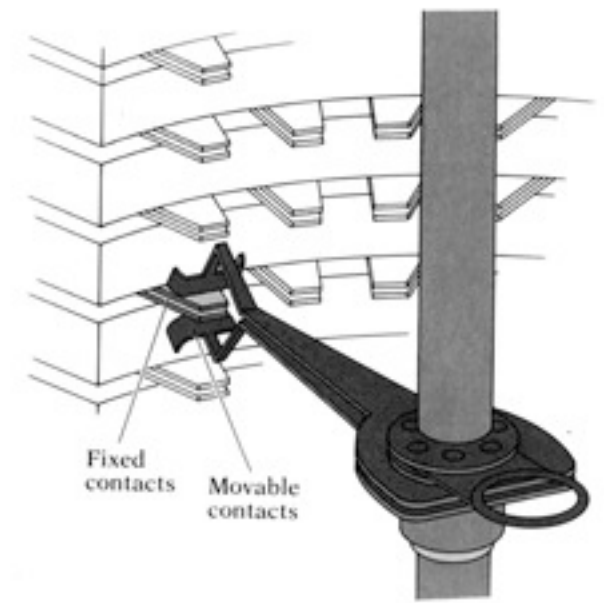
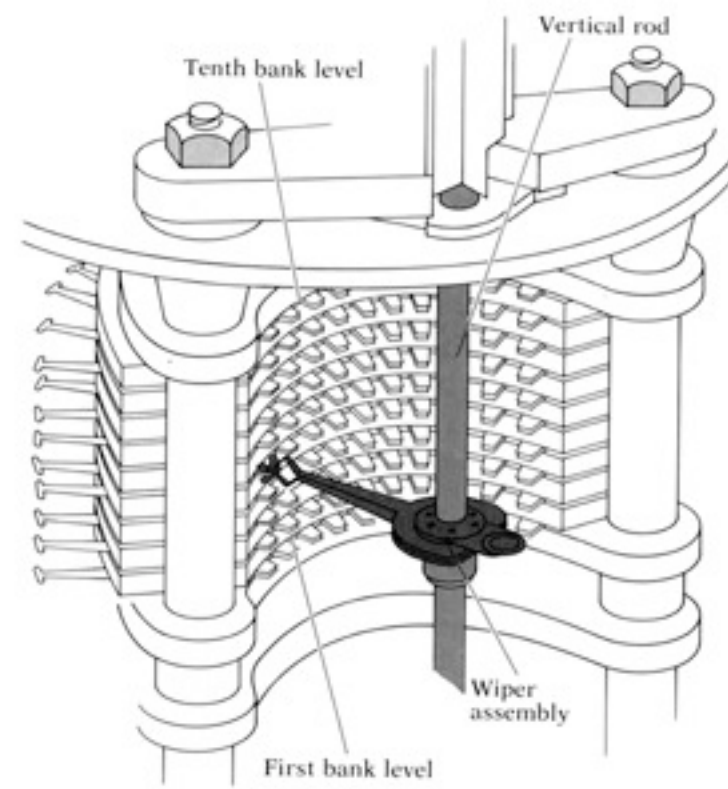
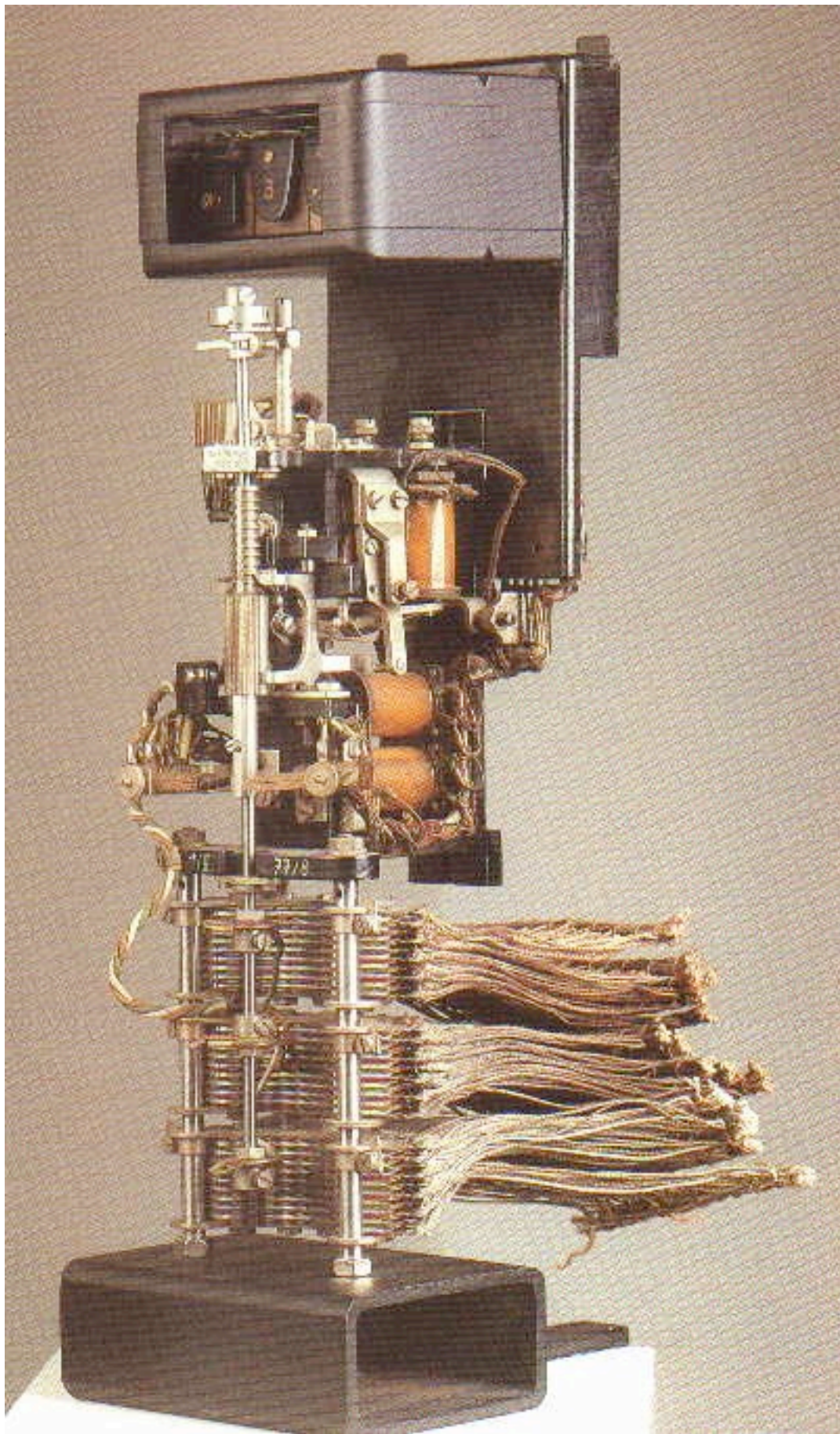


Informatics is changing the ways we think.



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Analogue representations
Diverse technologies
Specialised manufacturers
Beginning of personal portable information

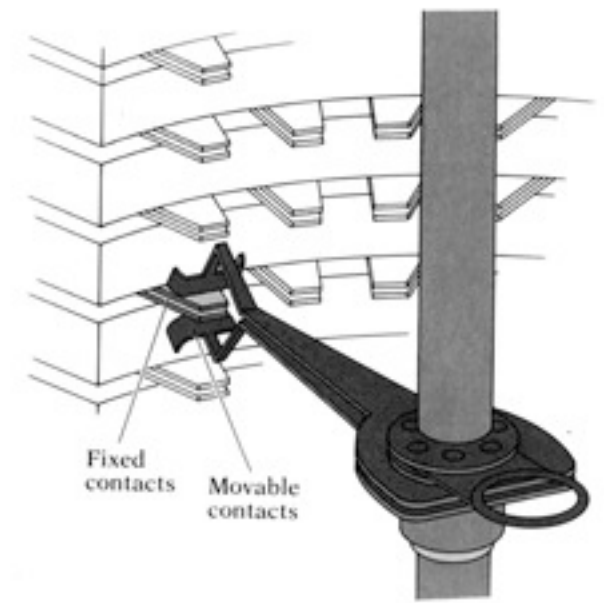
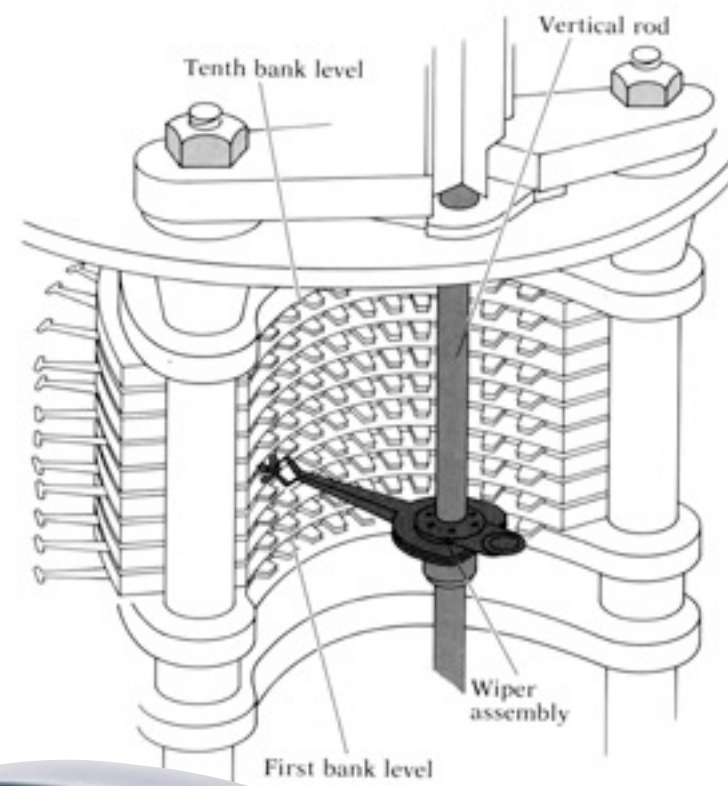
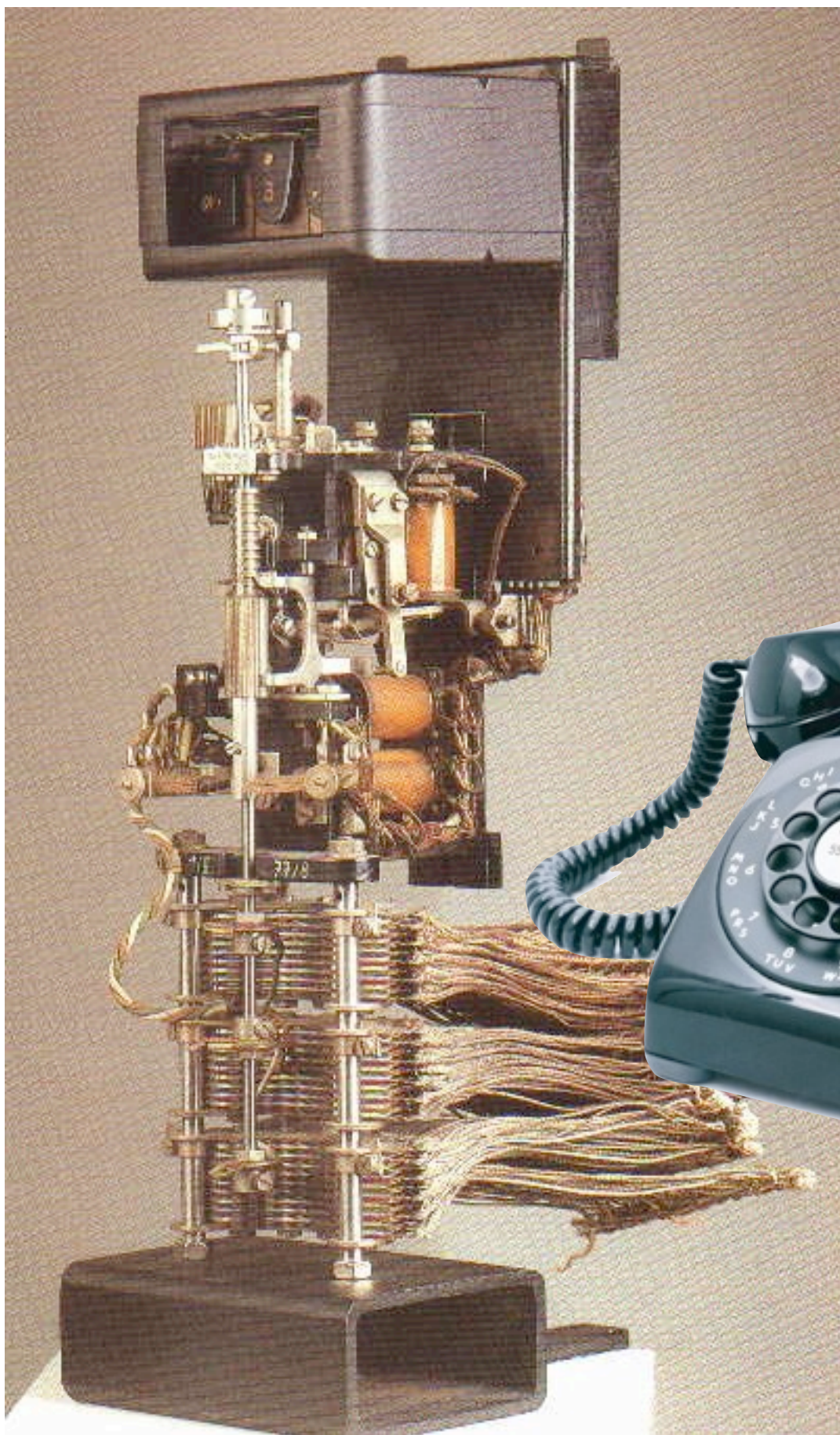


The movable contacts in a step-by-step switch can connect to any of a 100 different pairs of fixed contacts, each leading to a different line.



Tuesday, 6 December 11

Electro-mechanical switching



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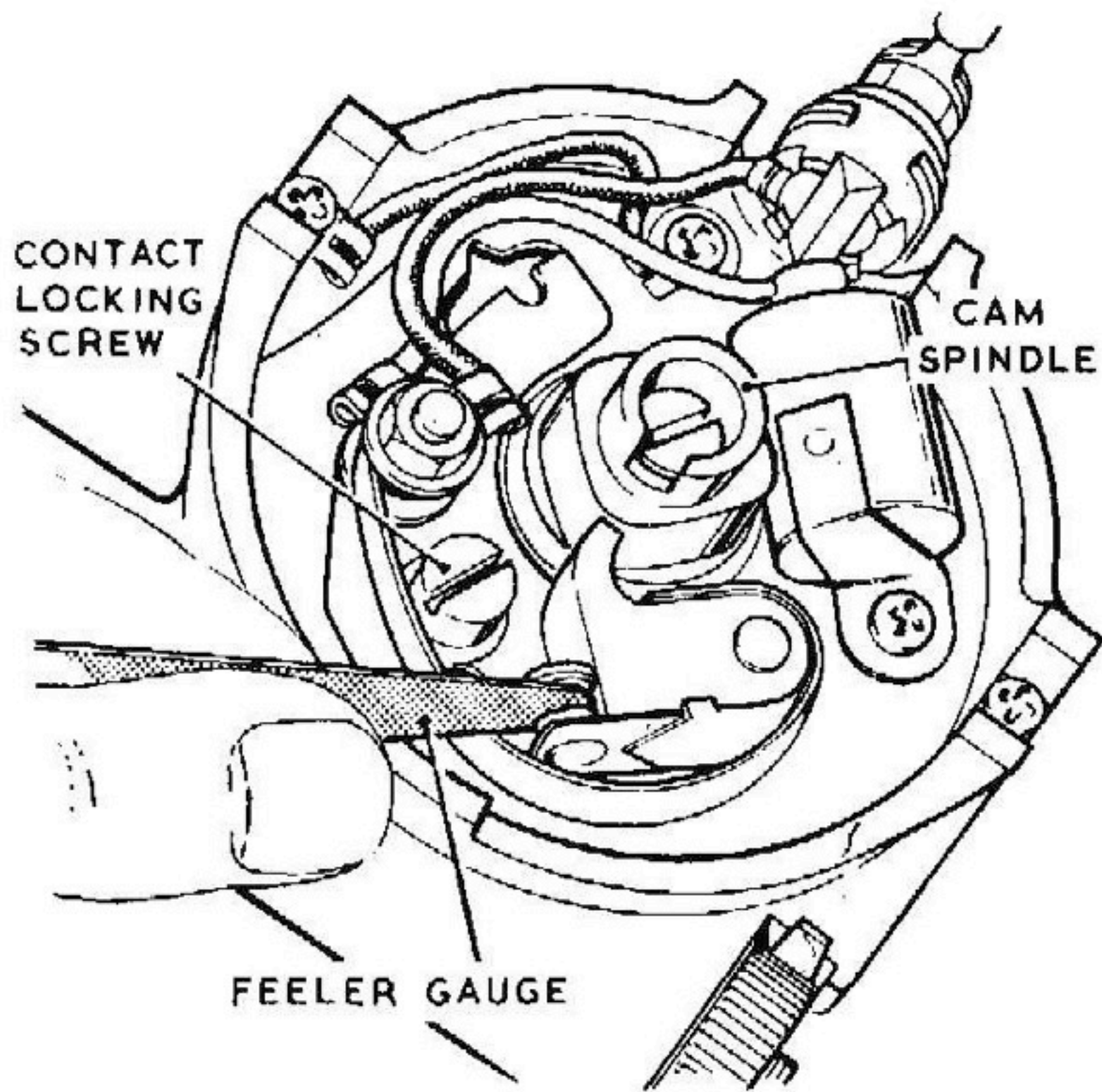
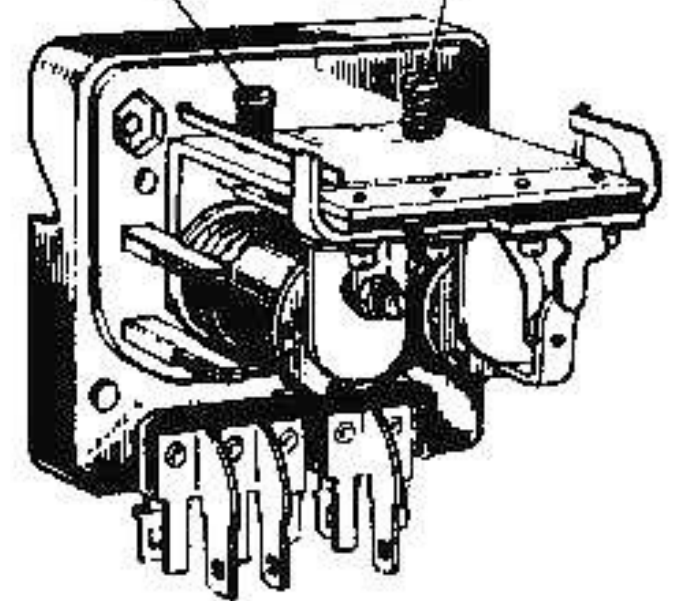


Fig. N.14—Checking the distributor points.

CONTROL BOX MODEL RB 106/2

REGULATOR
ADJUSTING
SCREW

CUT-OUT ADJUSTING
SCREW



A I A F D E

Fig. N.8





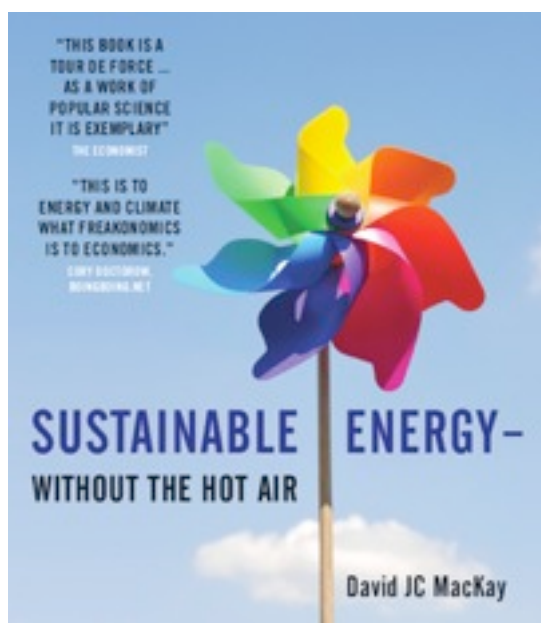
DVD
~ 4.5GB

Tubular Bells
100 copies ~ 4GB



How much data can we store?
– an example ...

full colour pdf
384pp ~ 10MB



2^{40} bits



2^{40} seconds
~ 32,000 years

world population
~ $2^{33} = 8G_p$



0110011011110110
0100111011001101
1011101011011001
0010101100110111
0110011011110110
0100111011001101
1011101011011001
0010101100110111

$2^7 = 128$

bits per person

Tuesday, 6 December 11

roughly 32 million seconds per year – say 2^{25}
so 2^{40} seconds is roughly 2^{15} years (actually 34842.1652 years)
– or we could store 32,000 bits (1000 numbers?) every second for one year
12,800 copies of the book – 5 books per week for a lifetime
3,200 copies of the LP – 8 hours per day for more than a year
30 copies of the DVD
128 bits per person – enough to encode both parents and best friend
position 360 degrees 9 bits + 180 degrees 8 bits

The endless cycle of idea and action,
Endless invention, endless experiment,
Brings knowledge of motion, but not of stillness;
Knowledge of speech, but not of silence;
Knowledge of words, and ignorance of the Word.
All our knowledge brings us nearer to our ignorance,
All our ignorance brings us nearer to death,
But nearness to death no nearer to GOD.
Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?

T h e R o c k – T . S . E l i o t

Information is not knowledge
Knowledge is not wisdom
Wisdom is not truth
Truth is not beauty
Beauty is not love
Love is not music
Music is THE BEST...



F r a n k Z a p p a - P a c k a r d G o o s e

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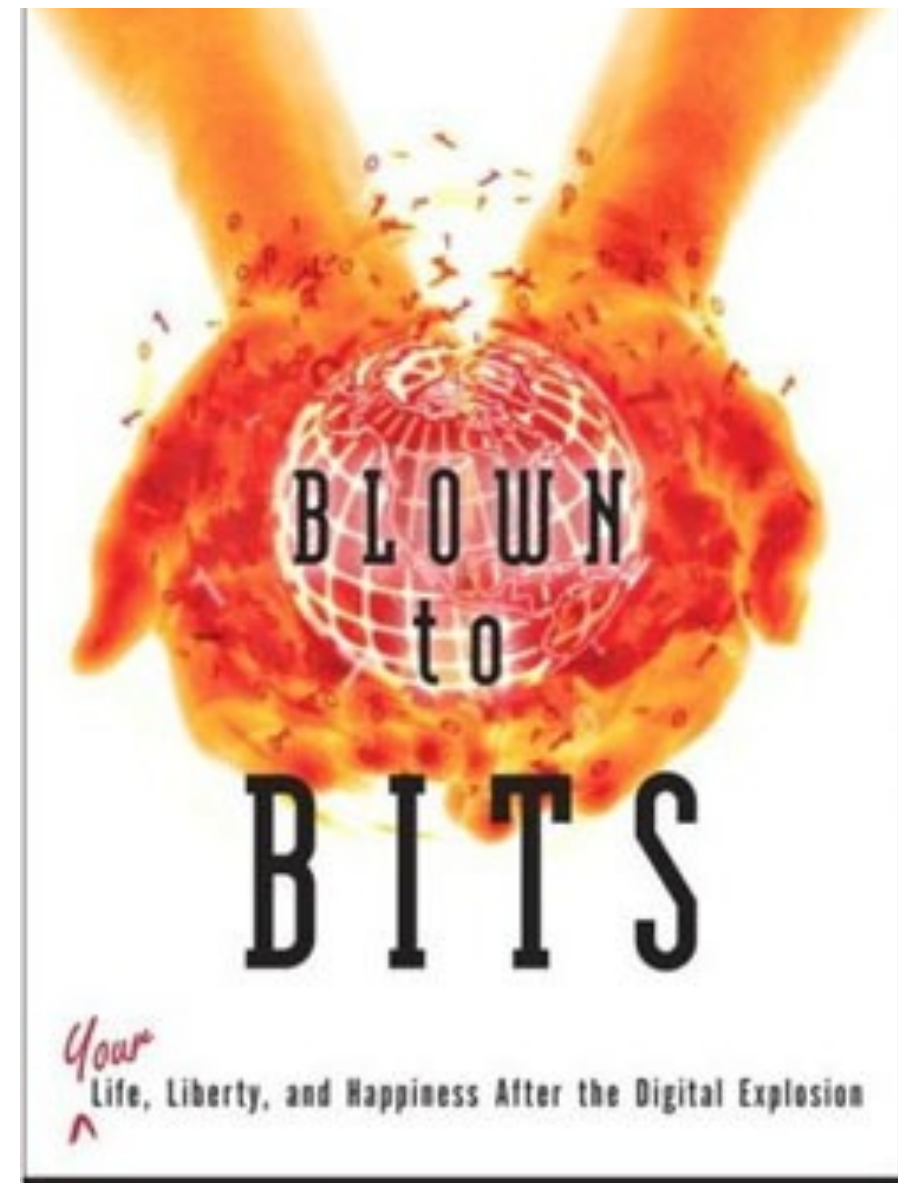
Bits are bits, whether they
represent movies,
payrolls, expletives, or
poems.

We can do everything with Information

- Copy, Compress, Communicate
- Encrypt, Sign
- Analyse, Collate, Compare
- Forge, ...

Blown to Bits

Available free online:
<http://www.bitsbook.com/>



starting off

- 19 Monday Computational Thinking
- 20 Tuesday Social and Legal issues
- 21/22 Lab Introduction
- 26 Monday Guest lecture 17:00-18:00 G.07
- Wednesday 5 October 16:00-17:00
 - Special Lecture (no extra charge :-)