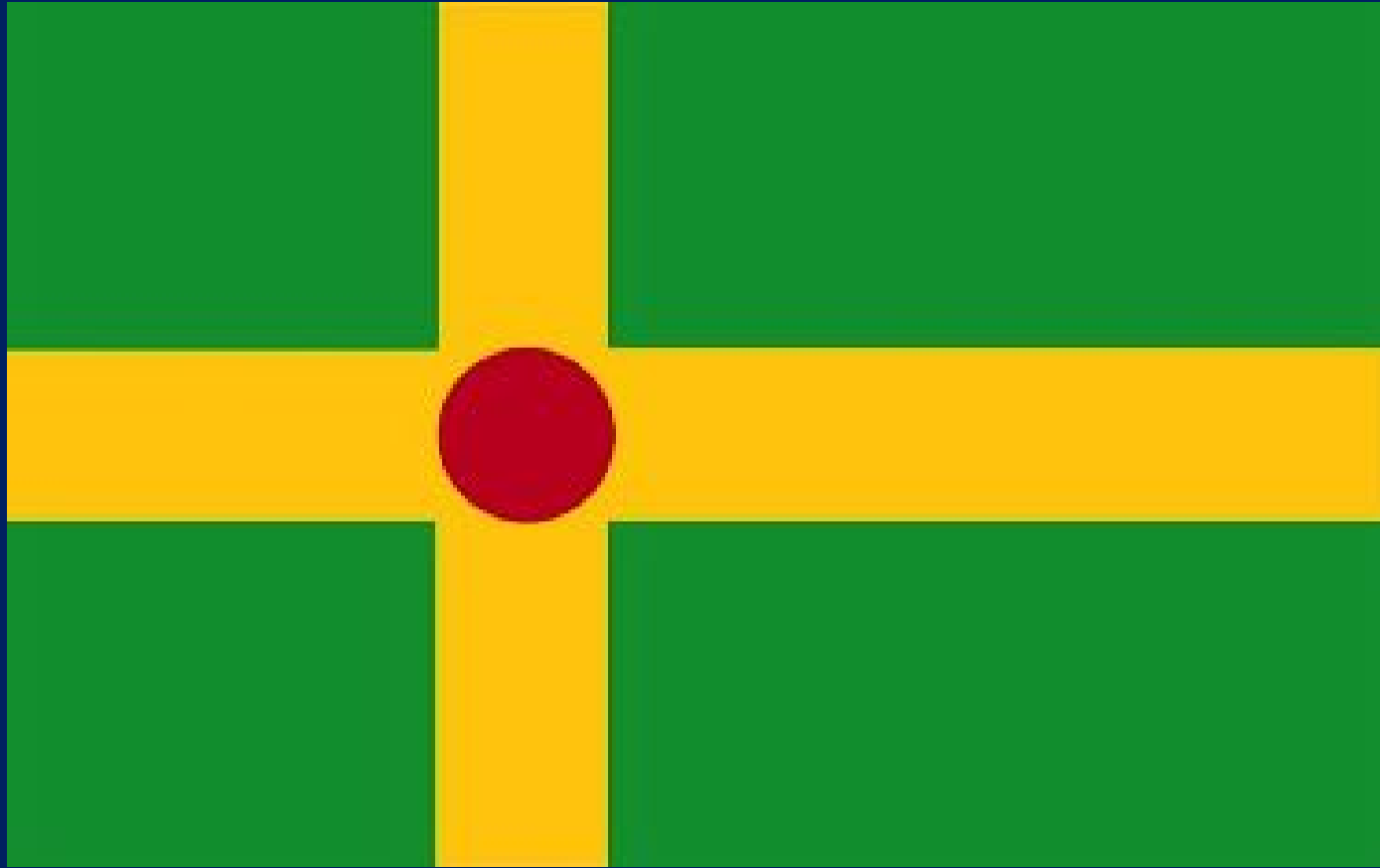




A WALK DOWN THE MEMORY LANE OF ELECTRONICS

By Stefan Johansson



**My family flag, composed of the rain
forests of Brazil, the yellow fields of
Sweden, and the rising sun of Japan**

One of the subjects at Chalmers



History of Electricity



Samuel Klingenstierna (1698–1765)

Swedish mathematician and scientist.

First a lawyer, but soon moved to natural philosophy.

Professor of geometry in Uppsala University from 1728.

In 1750 moved to physics.

In 1756 tutor of the Crown Prince, future King Gustav III.

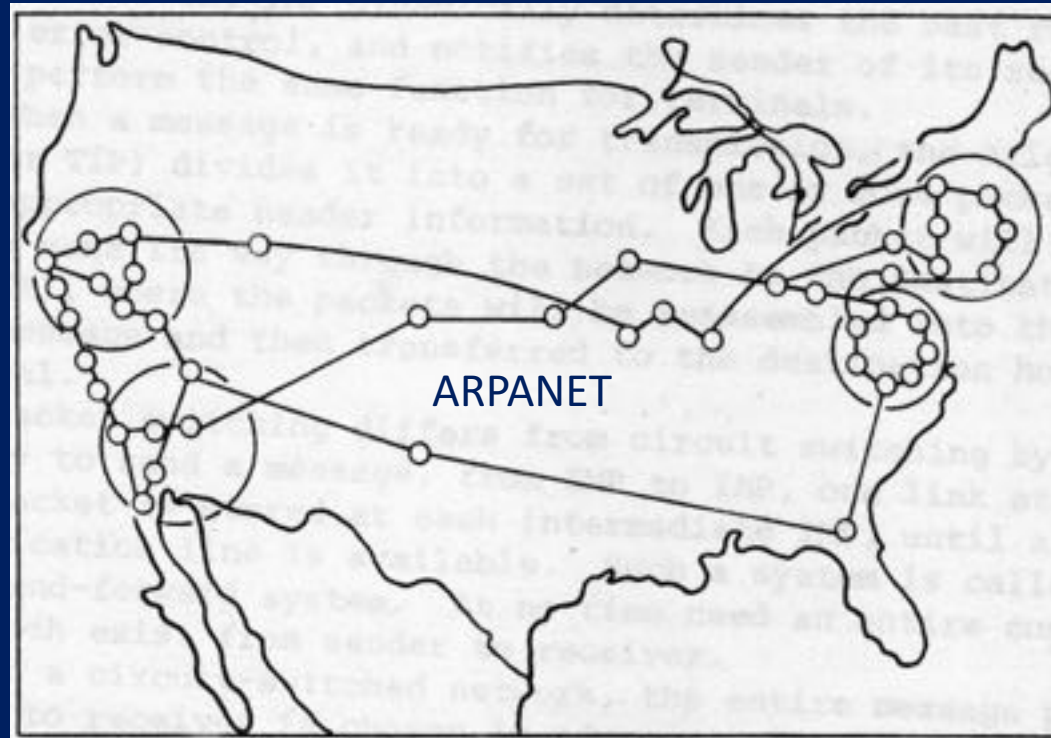
First to discover errors in Newton's theories of refraction.

Instrumental in invention of the achromatic telescope.

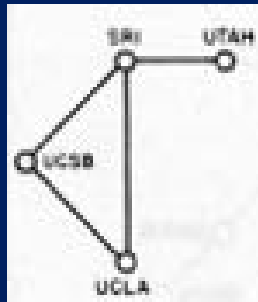
Klingenstierna published only in Sweden and in Swedish, thus not well recognized abroad.

Another subject at Chalmers

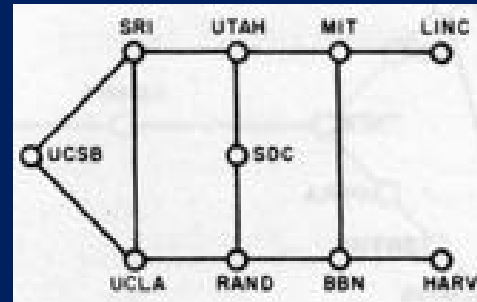
Computer Networks



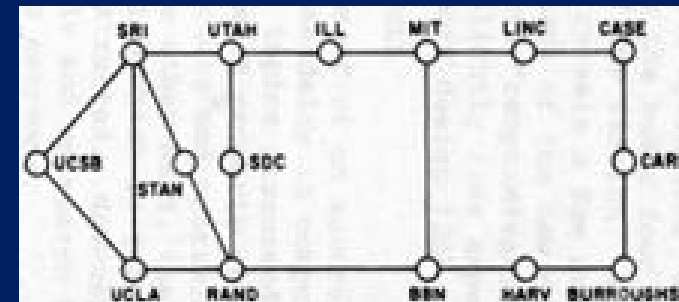
Evolution of ARPANET



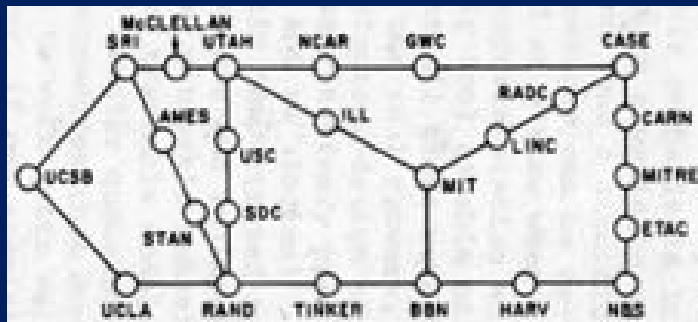
December 1969



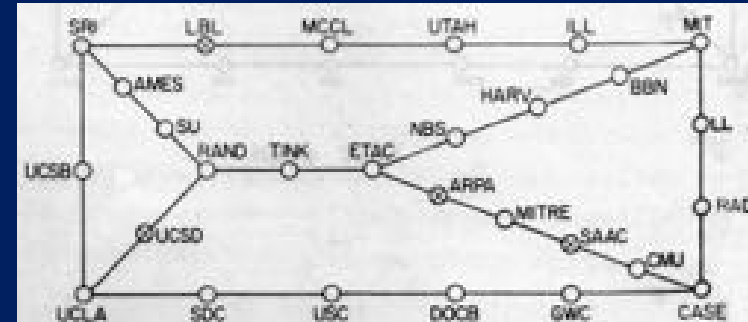
July 1970



March 1971

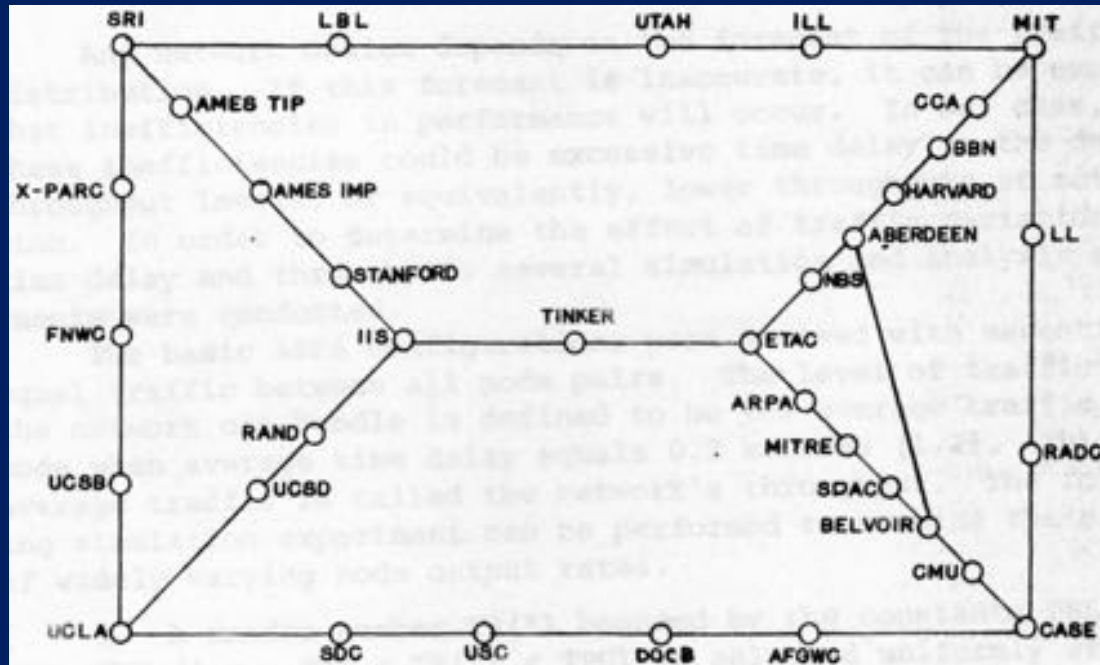


April 1972

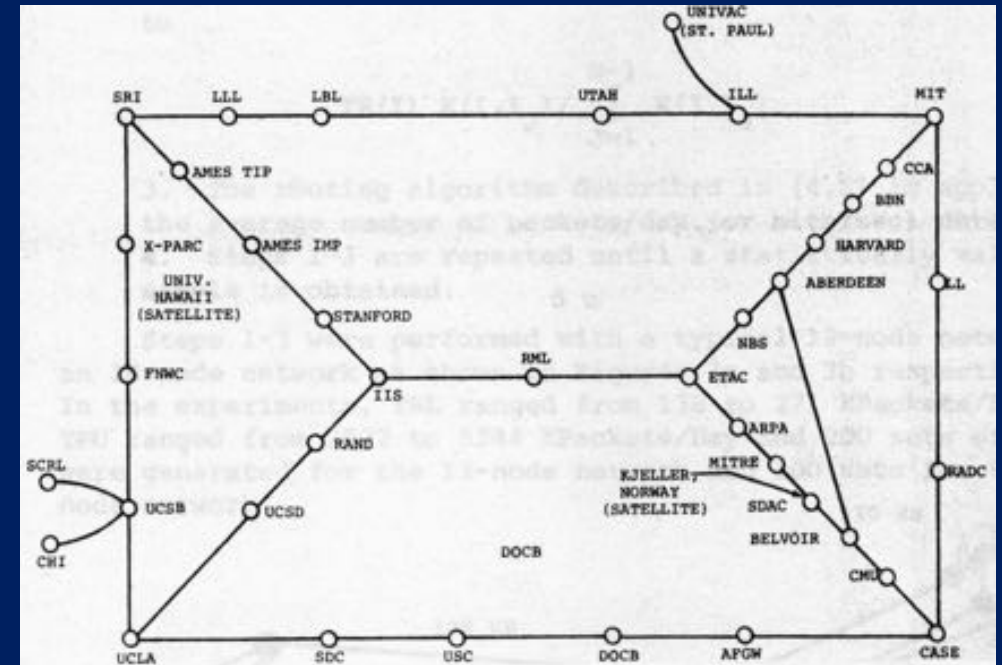


August 1972

Evolution of ARPANET (Cont.)



November 1972



March 1973

Evolution of electronics

Gordon Moore, co-founder of Fairchild and Intel semiconductor companies, published an article in Electronics Magazine in April, 1965:

- The integration of electronic devices is doubling every 12-24 months.
- This leads to smaller and yet more powerful and effective devices.

Watch this video commemorating
50 years of Moore's Law

<https://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html>

Moore's Law in practice



8 MB (2000)
82 x 23 x 15 mm

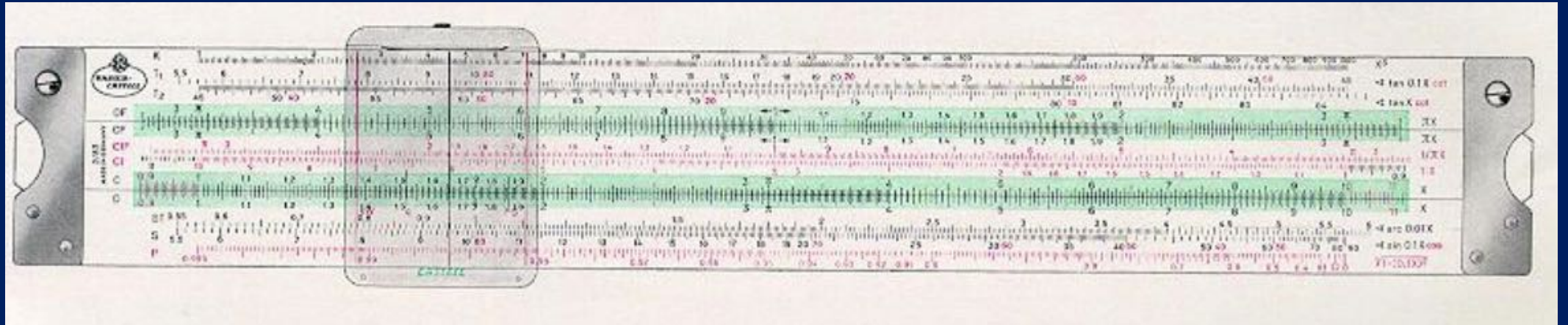


1 GB (2007)
34 x 16 x 3 mm



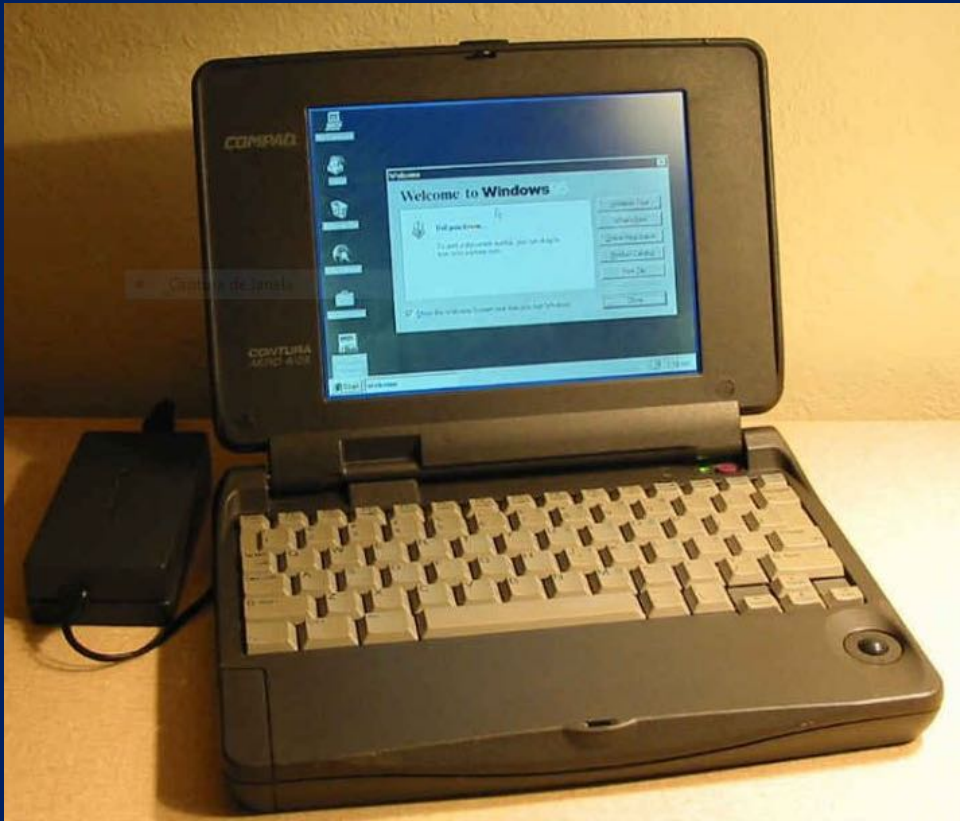
256 GB (2015)
37 x 20 x 11 mm

Pre-electronic calculations



Faber-Castell slide rule model 2/83 N, November 1972

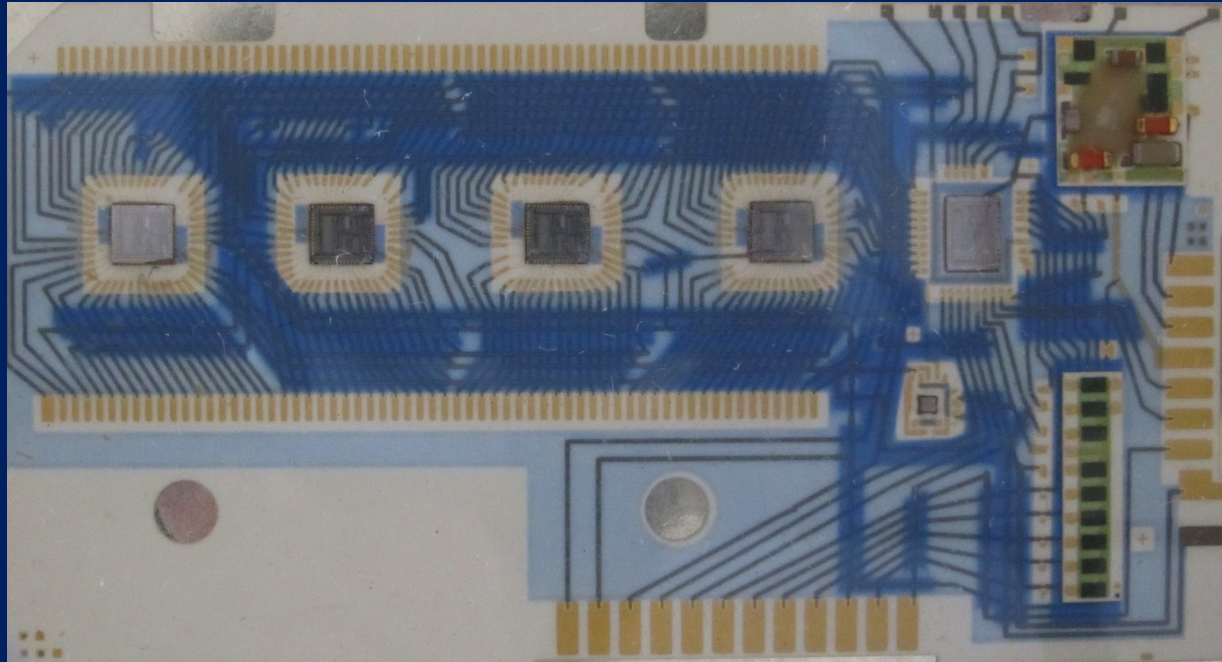
Laptop computer in 1994



Compaq Contura Aero 4/25
Typical configuration:

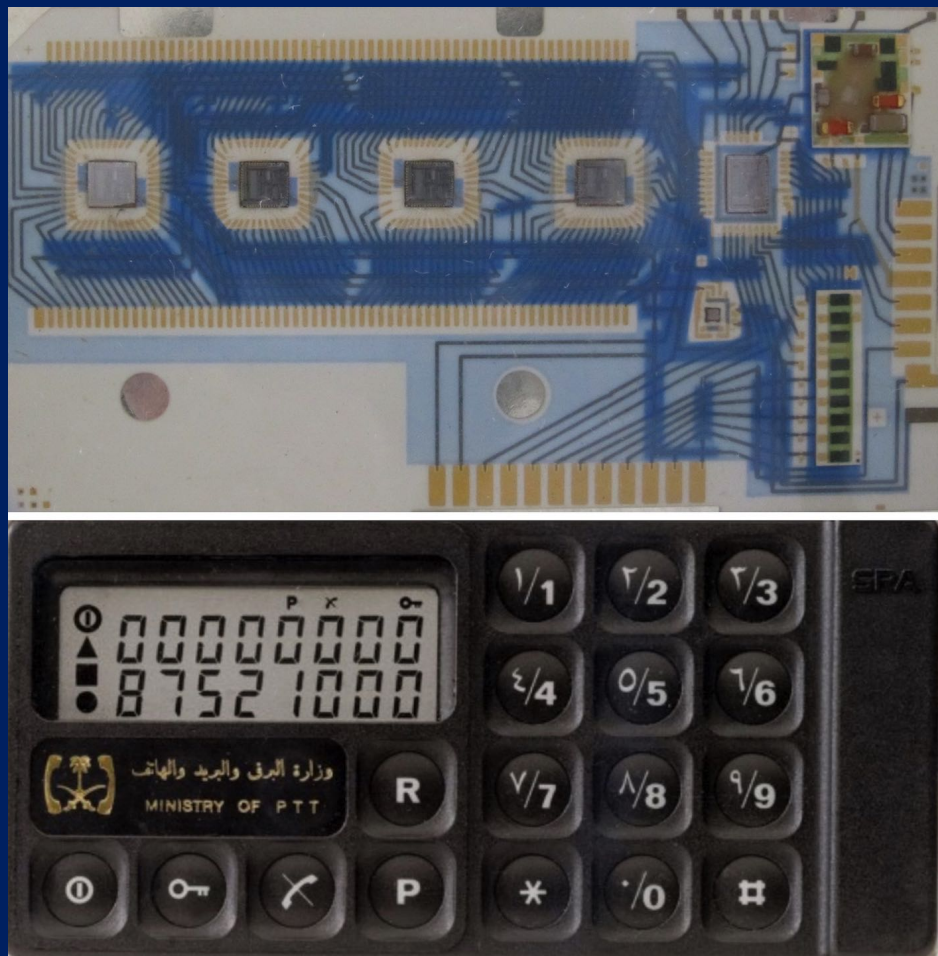
- Processor 486SX 25 MHz
- Windows 3.1, updated to Windows 95 in 1995
- Monochrome VGA screen with 16 shades of gray
- 84 MB, 170 MB or 250 MB hard disk drive
- RS-232, Centronics, and 1 slot of PCMCIA

Mobile communications in 1982



Display driver circuit for a mobile telephone

NMT mobile telephone 1982



Oh, and there was one more thing ...

... the bulk of the mobile phone system



Weight 8 kg,
Dimensions 37 x 20 x 11 cm

Thanks to Bertil Thorngren and Svenolof Karlsson for research

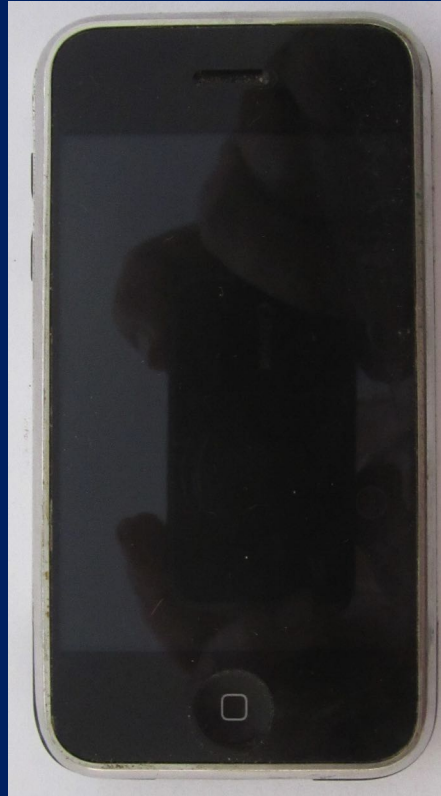
Examples of mobile phones from the last two decades



Nokia 6120
(1997)



Sony Ericsson
W710i (2006)



Apple iPhone
(2007)



Motorola Razr2
(2007)



Sony Xperia Z2
(2014)

But the electronic evolution continues, in the words of Master Gordon Moore:

“Just remember, what has been done, can be outdone!”



Apple iPhone X

The newest mobile phone in the world, at least until tomorrow



**THANK YOU FOR YOUR
ATTENTION!**