

The Purchase of a KDF9 in 1964

by Bill Findlay

In 1964 Glasgow University acquired a 16K word (96 K byte) English Electric KDF9 equipped with 4 model 1081 magnetic tape decks, a 100 characters/second paper tape punch, a 1000 characters/second paper tape reader and a 600 lines/minute printer. The machine was controlled by its operators using of a Friden Flexowriter online typewriter console.

A document has recently come to hand that sheds light on the costs of such a purchase. Bearing in mind that a 2021 smartphone is at least 20,000 times faster than KDF9, these numbers are quite eye-opening. They go far to explaining why the computers of the day were attended by a priesthood who discouraged mere users from any contact with the ‘giant brains’.

There seems to have been some negotiation over the prices of many components, so these numbers are indicative of computer economics in the early 1960s, not definitive of the final contracted costs.

Component	1964 price	approx. 2021 price
KDF9 CPU	£100,000	£2,000,000
RAM: 6 μ s core store, per 4KW (24 KB)	£18,000	£360,000
Paper tape reader	£3,000	£60,000
Paper tape punch	£2,000	£40,000
Friden Flexowriter	£2000	£40,000
Model 1081 magnetic tape deck	£10,000	£200,000
Line printer (600 lines/minute)	£31,400	£628,000

This configuration cost over £250,000, or about £5 million in 2021 money.

Regrettably, it was not adequate to let the KDF9 show its full capabilities, lacking as it did both the RAM and mass storage that would make for efficient use of the CPU. Those responsible for this penny-pinching can perhaps be excused on the grounds that, even in this handicapped form, KDF9 was very much faster than the English Electric DEUCE that preceded it. However the press and politicians got wind of these shortcomings and used them to stir controversy. Eventually the government was induced to fund enhancements that liberated KDF9's true power. Addressing parliament, Lord Bowden [Hansard] said:

The most urgent part of the Flowers programme is the upgrading of the KDF9 machines already installed in seven universities; and here I should like to correct a point of misunderstanding. I do not quite know how it has arisen, but it shows the degree of ignorance there is in this field—certainly not among your Lordships, but in the Press outside. It has been said that this in some way implies that the machines were unsatisfactory. Of course this is an absurdity. The essence of the proposition is that they are enlarging the capacity, and they are doing so by suitable additions in a compatible form. The additional equipment is being ordered and it will greatly enhance the computing power. Something like £1 million is likely to be spent on this part of the programme in the year 1966–67, with further expenditure in the following year. The orders for the hardware have already been placed with English Electric.

The hardware in question brought the University KDF9s up to the ‘EGDON configuration’, which permitted the implementation of the Eldon 2 and COTAN 3 multi-access systems [FindlaySW]. In this form the machines provided reliable, efficient and accessible service for many years, the last two being decommissioned at the National Physical Laboratory in 1980.

The following are prices for some of the devices that were installed. Unfortunately, I do not have a price for the Data Products disc drive, on which EGDON and the multi-access systems were based.

Component	1964 price	approx. 2021 price
Timesharing option (3 additional registers sets & associated logic)	£25,000	£500,000
Card reader (600 cards/minute)	£10,000	£200,000
Card punch (150 cards/minute)	£27,360	£547,200
IBM-compatible 7-track tape deck and controller (Ampex TM4)	£30,000	£600,000

To complete the picture, here are prices for devices that were never installed at Glasgow University.

Component	1964 price	approx. 2021 price
Model 1085 (double speed) magnetic tape deck and controller	£35,000	£700,000
Sperry type 2C drum store, 36KW	£20,000	£400,000

The computing power of one smartphone, which exceeds the total power of all computers in existence in 1964, would have cost about £100 billion at these rates. That makes my iPhone seem like a real bargain!

REFERENCES

[Hansard] Hansard HL Deb 02 March 1966 vol 273 cc715-57.

See: api.parliament.uk/historic-hansard/lords/1966/mar/02/computers-for-research-1

[FindlaySW] *The Software of the KDF9*; W. Findlay; 2021.

Available at: www.findlayw.plus.com/KDF9