= Sinclair Executive =

The Sinclair Executive was the world 's first " slimline " pocket calculator , and the first to be produced by Clive Sinclair 's company Sinclair Radionics . Introduced in 1972 , there were at least two different versions of the Sinclair Executive , with different keyboard markings , and another called the Sinclair Executive Memory , introduced in 1973 .

Its small size was made possible by pulsing the current to the Texas Instruments integrated circuit , reducing the power consumption by a factor of more than 10 . The Executive was highly successful , making GB £ 1 @.@ 8 million of profit for Sinclair and winning a Design Council Award for Electronics .

= = History = =

The Executive was launched in September 1972 at the price of GB £ 79 @.@ 95 plus VAT , equivalent to £ 950 in 2015 when adjusted for inflation . This was around half the price of comparable calculators , but still twice the average weekly wage . It was the first pocket calculator , and the first to be mass @-@ produced , and its introduction to the market coincided with a number of other companies entering the calculator market .

Clive Sinclair , reckoning that the market for " executive toys " was not especially sensitive to price , ordered components for 100 @,@ 000 calculators . The Executive was highly successful , and made 1 @.@ 8 million pounds profit for Sinclair Radionics . It was well received by both domestic and foreign markets , and US $ 1 @.@ 5 million worth of Executives were sold in Japan in early 1974 at six times the price of Japanese models . The parts , consisting of the TI 1802 chip , 22 transistors , 50 resistors and 17 capacitors , cost close to GB £ 10 , compared with a sale price of close to GB £ 80 . The Executive impressed the engineers at Texas Instruments , who had used the same chip to produce a longer and wider calculator that was over three times as thick and a great deal more expensive . In 1974 , sales of the Executive were greater than GB £ 2 @.@ 5 million , and Sinclair was producing 100 @,@ 000 calculators each month , of which 55 % were exported .

A Sinclair Executive purchased by a Russian diplomat exploded in his breast pocket , allegedly leading to an official Soviet investigation . It was found that it had been left on by accident , leading to a current drain on the batteries that overheated them until they burst .

= = Design = =

It was significantly smaller than any of its competitors , and the first calculator that could easily be carried in a pocket . According to a Sinclair executive quoted in the Financial Times , " one must always bear a packet of cigarettes in mind as the ideal size , " possibly a quip on Clive Sinclair 's smoking habit . The Executive weighed 2 @.@ 5 ounces (71 g) and measured 56 by 138 by 9 millimetres (2 @.@ 20 in × 5 @.@ 43 in × 0 @.@ 35 in) . The case , designed by Richard Torrens and made of black injection @-@ moulded polycarbonate , required flexible glue to hold the two halves together .

Design Magazine described it as " at once a conversation piece , a rich man 's plaything and a functional business machine " . An example of the calculator is displayed at the Museum of Modern Art in New York , and the futuristic design earned it the Design Council Award for Electronics in 1973 . It was the first calculator designed to appeal to people because of its looks , and New Scientist described it as " not so much a professional calculator - more a piece of personal jewellery " .

= = = Functions = = =

As well as four @-@ function arithmetic , the Executive had the ability to compute squares , reciprocals , and multiply or divide by a fixed constant . The Executive could carry out sums to two , four or six decimal places , or use a floating decimal point .

= = = Chip = = =

The calculator was powered by a Texas Instruments GLS 1802 , a metal oxide semiconductor integrated circuit with 7000 transistors . A chip of this kind normally consumes 350 milliwatts , but by pulsing the power this requirement was reduced to 20 milliwatts . It was discovered that an early prototype continued to work if the batteries were disconnected and then reapplied quickly enough , as the capacitors in the circuit could hold a charge for up to five seconds .

Power is supplied to the chip in 1 @.@ 7 microsecond pulses as determined by the storage time of a control transistor . An oscillator clock operating at 200 kilohertz during calculations and dropping to 15 kilohertz between each operation means shut off time ranges from 3 @.@ 3 microseconds during calculations to over 65 microseconds between . The device relies on the capacitance of the chips to store information when there is no power , and 1 @.@ 7 microseconds proved sufficient for the chip to carry out a single change of state of the electronics . Any calculation can be done in 1000 such changes . This had the effect of extending battery life to about 20 hours of continuous use with three small hearing aid batteries , equivalent to about four months of normal usage .

= = = Screen = = =

The screen on the Executive was a monolithic seven @-@ segment gallium arsenide light emitting diode display , bought from a Canadian firm . Its small size reduced the power consumption and material cost , but it was still changed several times in pursuit of lower power consumption , creating issues with the reliability .

= = Executive Memory = =

The Executive Memory was launched in November 1973 , with the same physical dimensions as the original , but with the ability to memorise subtotals from any number of chain calculations . There were at least 3 versions , including the black and white Type 1 , and the Type 2 with a gold keyboard . The Executive Memory sold at the lower price of GB £ 24 @.@ 95 .