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Dear History Committee,

Thank you for the invitation to review the proposal for the IEEE to erect a plaque in Manchester to celebrate the Small Scale Experimental Machine (SSEM / "Baby") as the world's first computer to execute a meaningful program stored in a memory. I am responding in a personal capacity, but also in the broader context of being Chairman of Trustees for the UK National Museum of Computing and manager of the project at our museum to build a working reconstruction of EDSAC, another pioneering computer contemporaneous with Baby.

The proposal is well researched and provides more than adequate documentary evidence to make incontrovertible the significant claim that Baby was the first computer to execute a program stored in memory. The proposal also goes on to list other seminal developments from Manchester University that flowed from the development of Baby and its successors the Manchester Mark 1 and 1\* developed commercially by Ferranti, also a world first.

I understand you have also asked my colleague and friend Mr Christopher Burton to review the proposal. He is an authority on Baby, having led the project to build the reconstruction now in the Manchester Science and Industry Museum, and he too confirms the claims are correct based on discussions with Williams, Kilburn and Toothill and supporting documentary evidence.

The matter of "first computer" is always a challenging one in which to make claims, as many groups in the USA, UK and elsewhere were on the threshold of building stored program digital computers at the same time, but the credit for arriving first at a working computer running programs from a read-write memory undoubtedly goes to Manchester. There were mechanical, electromechanical and indeed electronic predecessors to Baby but none can claim to have had a read-write memory in the way we use the term today. The machines developed contemporaneously with Baby only came into successful operation significantly after Baby executed its first program. These machines may have been bigger, faster, and/or more practical for users but they commenced operation later. Similarly, while other machines were also

subsequently developed commercially, the evidence is incontrovertible that Ferranti manufactured the first machines to be delivered, as a product, to customers and indeed customers in several countries. Other manufacturer's machines may have been delivered in greater volumes and more widely but this was to come later than Ferranti's initial sales.

Reliable, fast, random access storage technology was the biggest technical challenge to beset the early pioneers. The development of Baby contributed an important new storage technology in the form of the Williams Kilburn Cathode Ray Tube store which enabled random access to a persistent memory and spawned subsequent developments elsewhere and commercially. From the evidence presented it is unambiguously clear that the Williams Kilburn Cathode Ray Tube was a significant innovation at the time and entirely conceived of and developed by Williams and Kilburn.

As the proposal goes into at considerable length, the construction and success of Baby was the start of a series of further direct contributions to the development of key concepts in modern computers including index registers, virtual memory and early developments in programming languages and compilers.

For all these reasons I believe Baby is an achievement the IEEE should recognize and I look forward to seeing the plaque erected as proposed.

Dr Andrew Herbert OBE, FEng  
Chairman of Trustees, The National Museum of Computing  
Manager, The EDSAC Replica Project