



# The ZX Spectrum Ula: How to Design a Microcomputer (ZX Design Retro Computer)

*Christopher David Smith*

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**The ZX Spectrum Ula: How to Design a Microcomputer (ZX Design Retro Computer)** Christopher David Smith

This book takes the reader through the design and implementation of the Sinclair ZX Spectrum's custom chip, revealing for the first time the decisions behind its design and its hidden secrets. By using it as case study, the techniques required to design an 8-bit microcomputer are explained, along with comprehensive details of the Ferranti ULA manufacturing process. If you have ever wanted to design your own computer or wondered what was behind the most successful microcomputer of the 1980s, then this is the book for you. For the first time, the inner working of the Sinclair ZX Spectrum's custom chip and heart of the computer, the Ferranti ULA, is exposed in minute detail. Packed with over 140 illustrations and circuit diagrams, this book takes the reader through the cutting edge technology that was the Ferranti ULA and the design of the ZX Spectrum home computer, illustrating the principles and techniques involved in creating a cost effective computer that required nothing more than a television set and a cassette recorder. The ZX Spectrum ULA is an essential read for the electronics hobbyist, student or electronic engineer wishing to design their own retro-style microcomputer or anyone with an interest in historical micro-electronic and digital design. All topics are explained in simple yet precise terms, building on their careful introduction towards the full functionality presented by the Sinclair computer. Some of the topics covered are: The architecture of the standard microcomputer, Ferranti and their ULA, manufacturing process and structure, The functional layout of the ZX Spectrum ULA, Video display generation, Memory contention and timing, ZX Spectrum design bugs such as "The Snow Effect", Hidden features, ULA version differences.

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