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Four years in preparation, this book shows the model railroader how to design an automatic signaling and block control system that avoids the usual compromises. It properly responds to single or multiple trains of any length, including stops and reversals, while remembering proper status during system power-down. All types of signals are covered, from simple red/green to 3-color units with approach mode; and with or without self-latching or built-in aspect (red/amber/green) hierarchies. Road-crossing signal operation is properly asymmetrical in response to train direction, and adapts to stopping/reversing. The text encompasses AC and DC powered signals and trains of all gauges, including toy (high-rail) layouts, and includes both common cathode and common anode configurations for DC powered setups. To ensure realism, any substantive dependence on timers is avoided. A wide variety of homebrew and commercial train-sensors is covered, with instructions on DIY alternatives ranging from very simple to ultimate performance. Based on the use of the excellent scale signals that are on the market, the text applies to any combination of DIY and commercial sensor and control hardware. Multiple-block signaling with turnouts, tumble-down, and cross-tracks are discussed in detail. The use of the same sensors for automatic track (train or cab) control is described for turnaround loops and wyes, for the prevention of following- and opposing-train collisions, and for non-derailing at improperly positioned turnouts. Also covered is the application of these concepts in a Digital Command Control context. DIY Advanced Model Railroad Signaling Electronics assumes a very modest knowledge of electronics, or alternatively, the ability to interpret a schematic diagram and solder simple, highly economical components on a hobbyists circuit board. Specific electronic board layouts have been designed for the most important circuits, and commercial sources for the boards as well as all other components are provided. The book includes 97 figures and diagrams, and a comprehensive outline of contents.

About the AuthorJ. Richard (Dick) Kerr holds a Ph.D. in Electrical Engineering from Stanford University, and is a retired infrared, laser, and avionics systems engineer. He has authored over 60 scientific and engineering papers, and has been granted 10 patents. During his career he has been a professor, Graduate School president, engineering manager, and entrepreneur. Starting with an early childhood interest in model railroading, Dick has been fascinated with the idea of providing truly realistic, automatic signal operation that far exceeds the capabilities of commercially available toy train and scale model commercial units. Having (partially) retired, he has spent much of his time fleshing out these ideas in great detail, including testing on his own model train layouts. Many years have passed since the first motivation for these concepts, and he hopes that their final exposition will bring pleasure to- and stimulate the creativity of others in this challenging and timeless hobby.