Electrical relays

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by Nailen, Richard L

Electrical relays Electric Relays: Principles and Applications. By Dr. V. Gurevich. CRC Press, 6000 Broken Sound Pkwy., NW, Suite 300, Boca Raton, Fia. 33487; (800) 272-7737. $149.95 (hardbound). 671 pages.

More than a century and a half ago, the first practical electrical device was developed based on the work of such pioneers as Joseph Henry, Hans Oersted, and Michael Faraday. It revolutionized long-distance communication as dramatically as did radio several generations later. That device, the relay, made the telegraph possible.

Today, relays are involved in all electrical systems. The simple electromechanical types have been joined by a bewildering variety of others, some based on sophisticated microprocessors. But the principle of controlling a local circuit of different voltage or power level via a lower-level signal remains the same.

"Relay" is from the French relais meaning "replacement." That makes sense. In telegraphy, the relay allows a fresh, locally-powered circuit to replace the weakened signal coming over the distant wire, just as the fresh runner takes the baton from a tiring colleague to continue the race with renewed vigor.

Dr. Gurevich (with the Israel Electric Corp. in Haifa) identifies two sets of relay literature. One deals with low-power control devices, the other with protective relays, to the exclusion of many other widely used types. He has included them all in this book-thermal, opto-electronic, time delay, manometric, light flasher, stepping, sealed reed, polarized-even the gas detector relay used in liquid-filled transformers. Vacuum tubes are described; although not often thought of as "relays," early triode tubes served that purpose-the low-power grid circuit controlled the higher voltage plate circuit.

Written in entertaining, non-mathematical style, and profusely illustrated (more than 900 numbered figures), the text describes not only how relays

work and are used, but gives much of their history as well, including numerous anecdotes of both well-known and more obscure developers of electrical technology. A 26-page glossary defines terms from many sources (including IEEE, British, and IEC standards), ranging from "annunciator" to "zero-voltage turn on."

In addition to using some terms that may be unfamiliar (such as "Foucault currents" or "quincunx" coil winding), Dr. Gurevich raises many intriguing questions, such as "is a sealed relay always better than an open one?", "what is the purpose of 'contact pressure'?", and "does more current require bigger contacts?" (answer: not necessarily).

He considers microprocessor-based relays a mixed blessing, asserting that they do not enhance reliability, decrease the need for maintenance, or provide that many functions not available from electromechanical devices. When malfunctions do occur, they can be more difficult to find. He argues that complete elimination of the older types would be a forward step only if all instrument transformers and relay wiring were replaced by optical devices and connections.

Even "simple" relays have their limitations, of course, such as sensitivity to mounting position. Comments the author, "Unfortunately we often hear people talking about bad relays, but not about bad engineers constructing automation systems without taking into account those peculiarities of the relay."-RLN