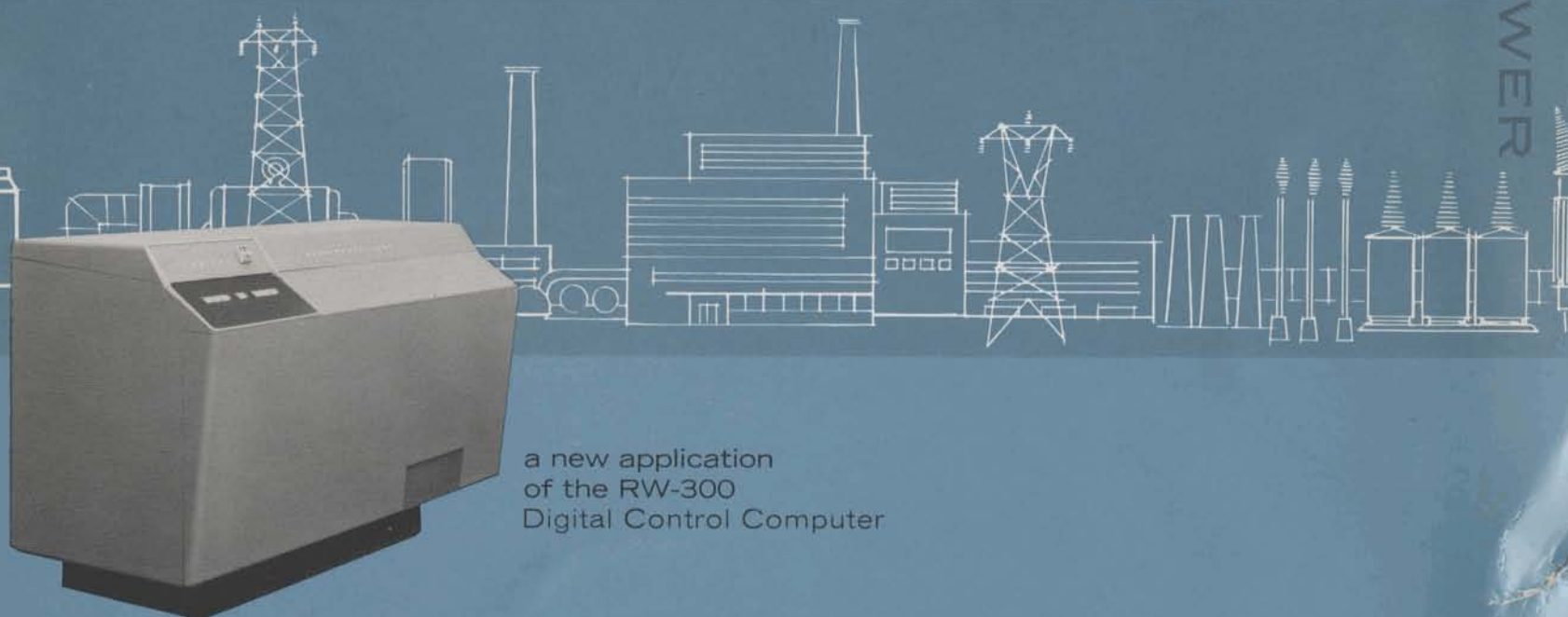


COMPUTER
CONTROL
AND
MONITORING

FOR

ELECTRIC
POWER
SYSTEMS

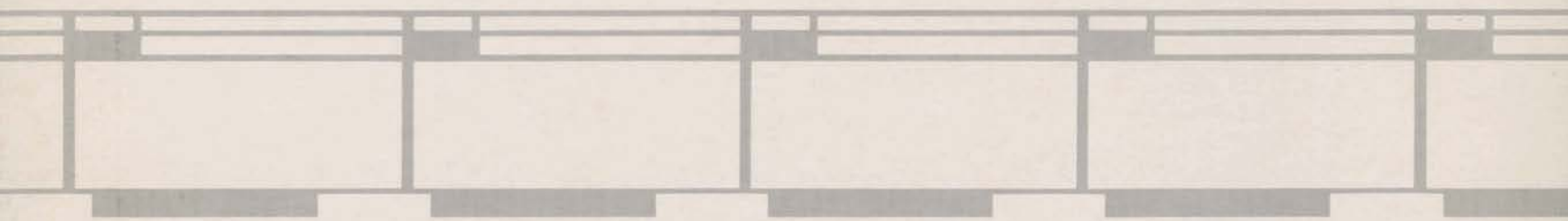
ELECTRIC POWER



a new application
of the RW-300
Digital Control Computer

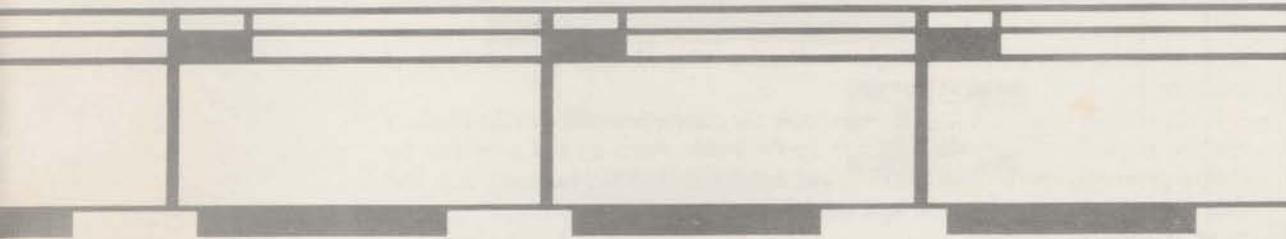
THE THOMPSON-RAMO-WOOLDRIDGE PRODUCTS COMPANY

a division of *Thompson Ramo Wooldridge Inc.*



Today's electric power generation plants are so large and complex that manual operation combined with analog sub-loop control has become costly, undependable, even hazardous. To assure reliable electric service and to protect the huge investments in modern boilers and turbine-generators, an advanced full-time automatic control tool is needed: an RW-300 computer control and monitoring system.

The RW-300 Digital Control Computer is a competitively priced machine that can assimilate the many pieces of data in steam generating plants, perform accurate calculations on this data, make logical decisions based on its calculations, and issue control commands that will assure continuous operation at minimum cost. The thoroughly proven RW-300 is the most field-reliable computer control system available today.



THE RW-300 CONTROL AND MONITORING SYSTEM

TYPICAL INSTALLATION . . . A typical RW-300 control and monitoring system for a steam generating plant includes an RW-300 Digital Control Computer as the central unit; analog and digital input-output equipment; standard measuring and sending instruments for pressures, temperatures, flows, etc.; indicating devices; and control devices actuated by the computer.

In operation, the RW-300 continuously scans the input instruments, stores raw and calculated data, calculates output signals suitable for closed-loop plant control, makes logical decisions based on input data, actuates alarm and warning devices when inputs exceed predetermined limits, and prints out measured and calculated data.

LOGGING OF DATA . . . Under the control of the logging program, a large number of input quantities are scanned for alarms, and those of historical interest are logged. Any input can be printed out or visually displayed on demand, whether it is a logged quantity or not. The quantities logged include both raw data and values calculated within the computer (such as heat rates, efficiencies, etc.). When a complete historical record is necessary, an RW-300 Magnetic Tape Unit can be added to the installation; all data, raw and computed, is then stored on tape.

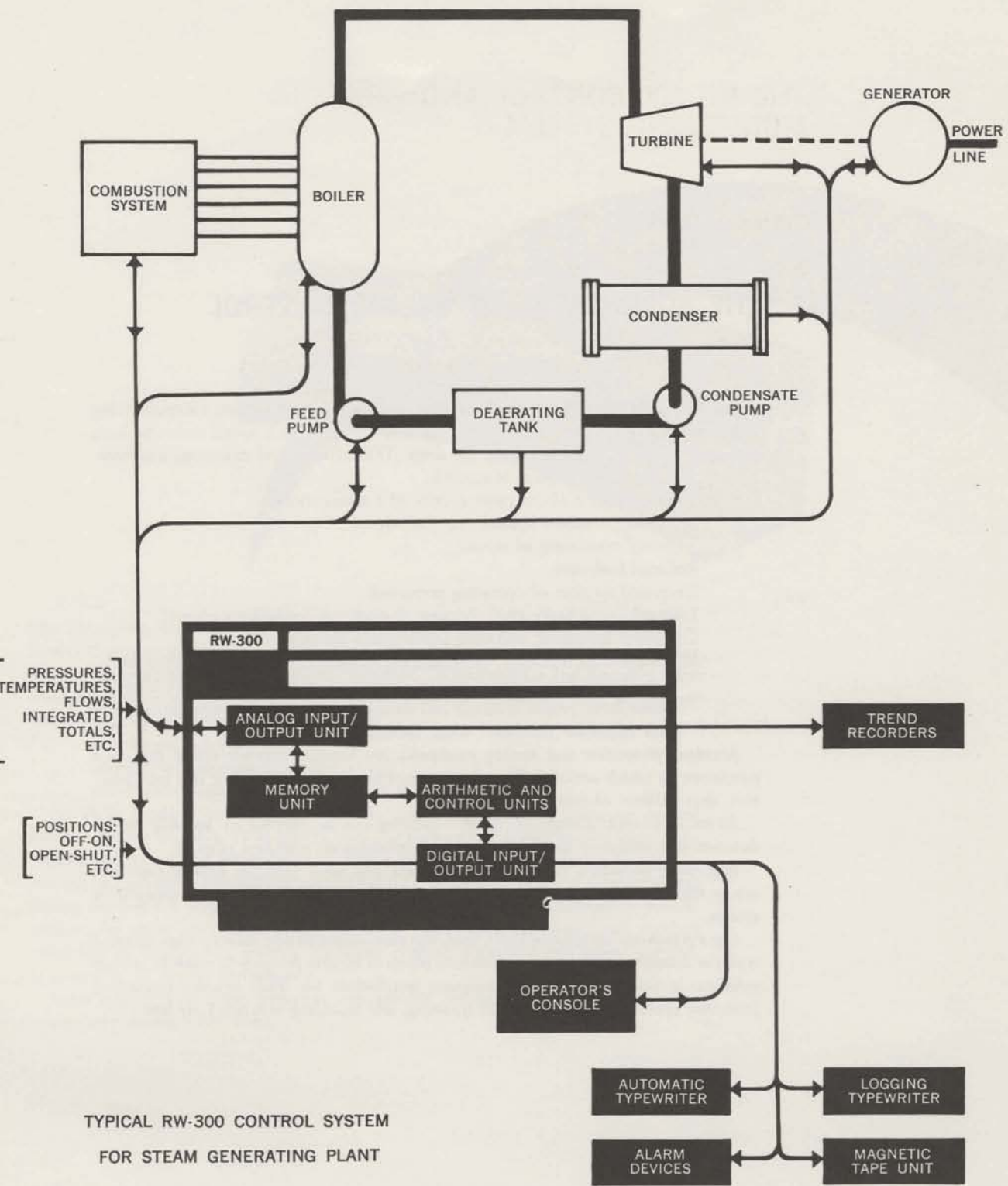
SCANNING FOR ALARMS . . . By consolidating all alarm functions in one piece of equipment, a comprehensive alarm system is provided. A major advantage of computer alarm scanning is that the alarm limits may be varied as operating conditions change, thus making the alarm function more meaningful. Further, complex checking sequences can be included.

PERFORMANCE CALCULATIONS . . . Since the computer can reduce data on-line, in real time, a continuous and up-to-date record of performance is immediately available. Typical performance calculations that may be performed by the RW-300 computer are: net unit heat rate; best possible heat rate for instantaneous environmental conditions; boiler efficiency; condenser, heat exchanger, and turbine-generator performance; average pressures, temperatures and flows for hour or day.

CONTROL . . . The computer produces analog and digital output signals suitable for plant control: positioning, opening, and closing valves; adjusting set-points; starting and stopping motors; etc. For the automatic startup or shutdown control function, the computer system provides a single, pushbutton-initiated, fully automatic control sequence.

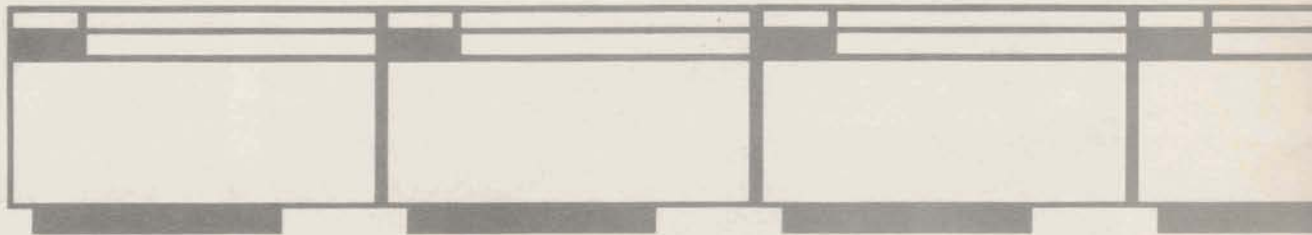
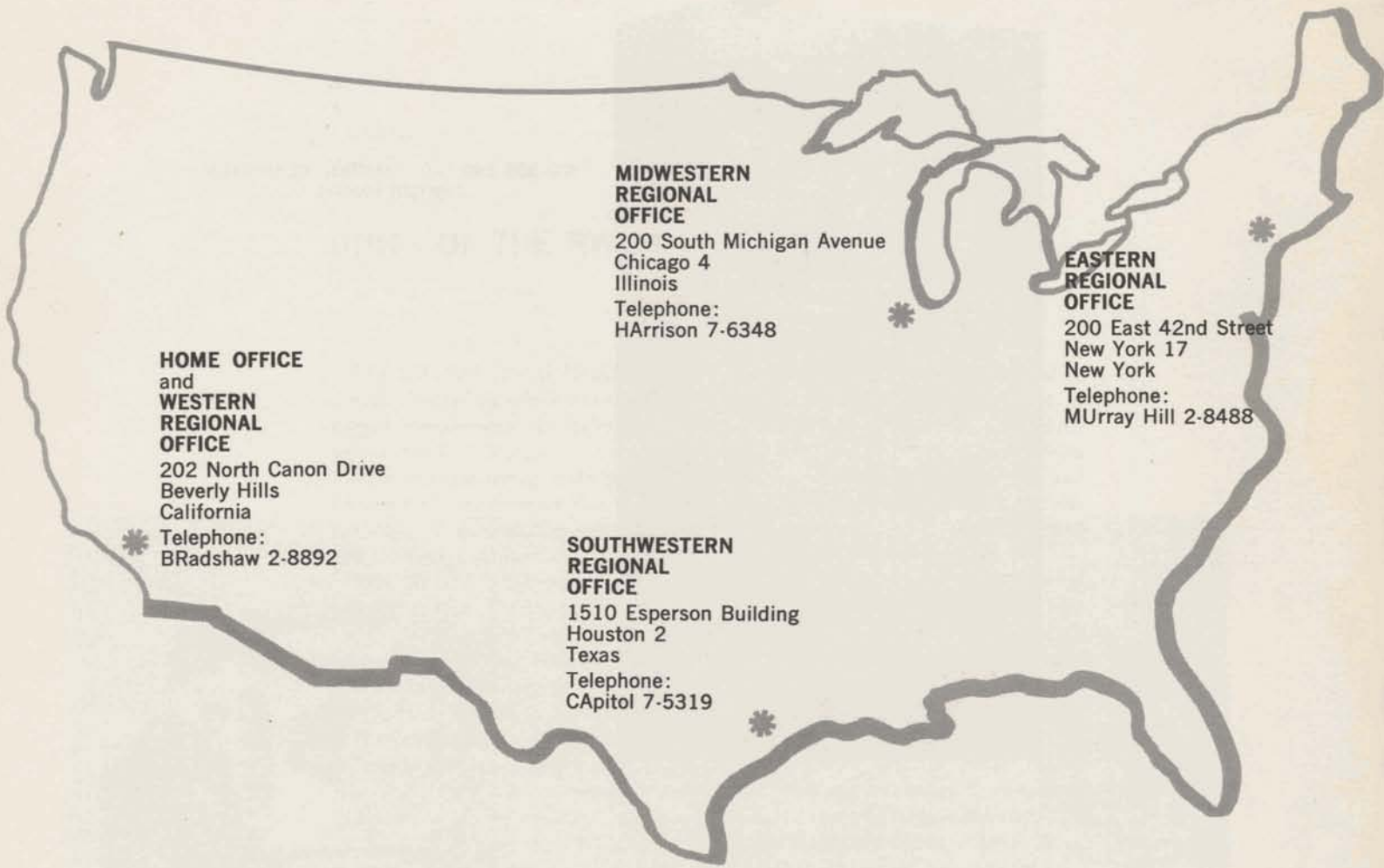
In the extended startup sequence, for example, the computer would start the auxiliary systems, prepare and light off and warm up the boiler, warm up and accelerate the turbine-generator, synchronize, parallel, and transfer load to the incoming unit, and then proceed into normal system load control.

SELF-CHECKS . . . As a part of its control and monitoring routine, the RW-300 computer regularly checks the accuracy of its own operation and that of the input and output instruments connected to it. Failure or maloperation is immediately signaled to the operator.



TYPICAL RW-300 CONTROL SYSTEM
FOR STEAM GENERATING PLANT

THE THOMPSON-RAMO-WOOLDRIDGE PRODUCTS COMPANY

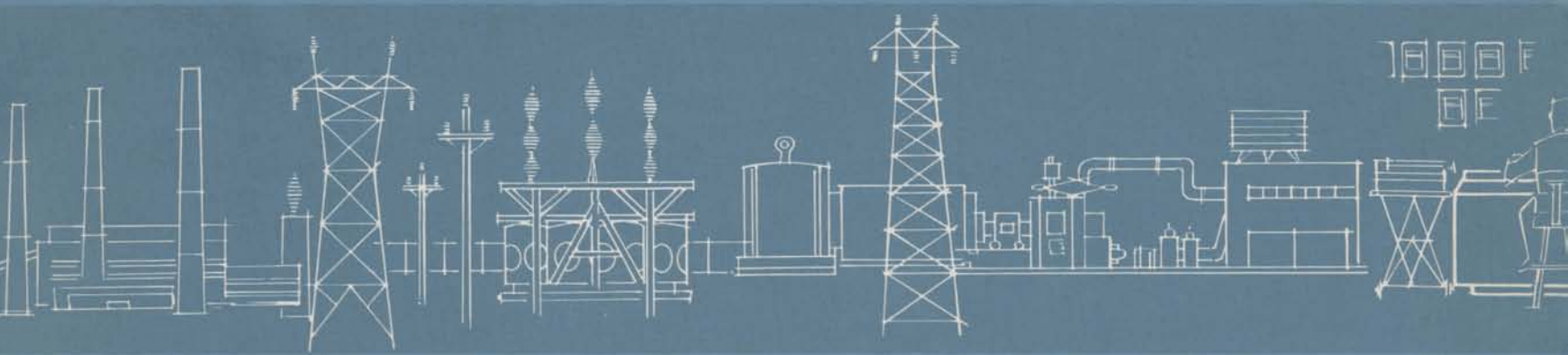


Although the choice of proper equipment is important for any data handling and control system, equipment alone is insufficient to ensure completely satisfactory operation. Application of the equipment to the external phenomena requires experienced engineers who can thoroughly analyze the problems involved, define the functions necessary, and prepare computer programs which will perform these functions efficiently and reliably. The installation engineering of the equipment is equally important — again requiring expert abilities gained only through active field experience.

To perform these important engineering tasks, Thompson-Ramo-Wooldridge Products has assembled an outstanding group of systems analysts, applications engineers, project engineers, and programmers. Many members of this group are well-known in their fields; all have extensive practical knowledge of the methods of on-line computer operation. This staff, skilled in the application of digital computers to a wide variety of industrial control and data reduction problems, is now participating in the development of RW-300 systems for many utility, nuclear, chemical, petroleum, primary metals, missile, and electronic companies.

Our service extends from a complete analysis of the problem to the development of the computer program and installation of the complete system. A nation-wide maintenance organization, as well as a comprehensive training program, is also available to users of the RW-300 Digital Control Computer. For further information concerning computer control and monitoring systems for the electric power industry, call or write any of our offices or:

Mr. Raymond E. Jacobson, Director of Marketing
The Thompson-Ramo-Wooldridge Products Company
202 North Canon Drive
Beverly Hills
California



COMPUTER CONTROL SYSTEMS
DATA-LOGGING AND SCANNING SYSTEMS
SYSTEMS ENGINEERING

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