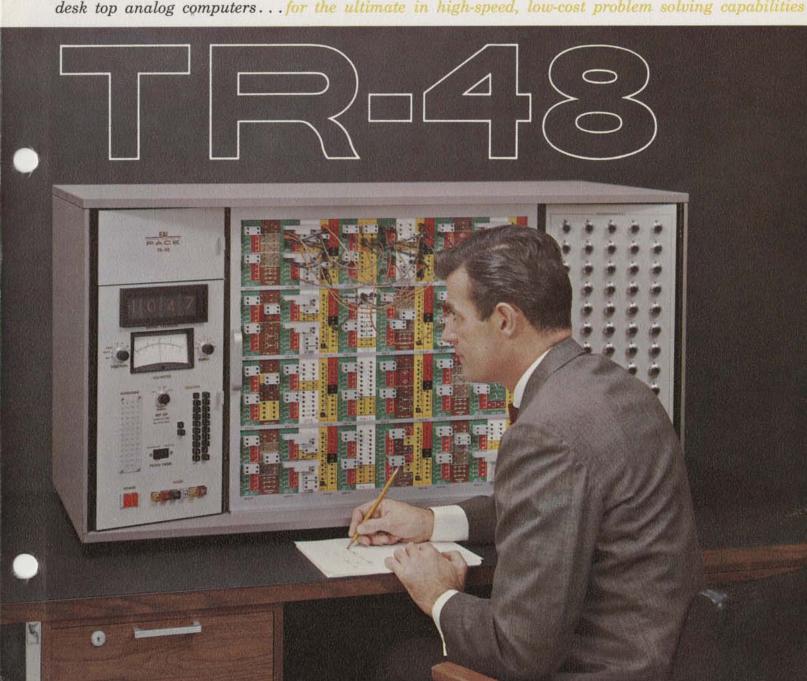
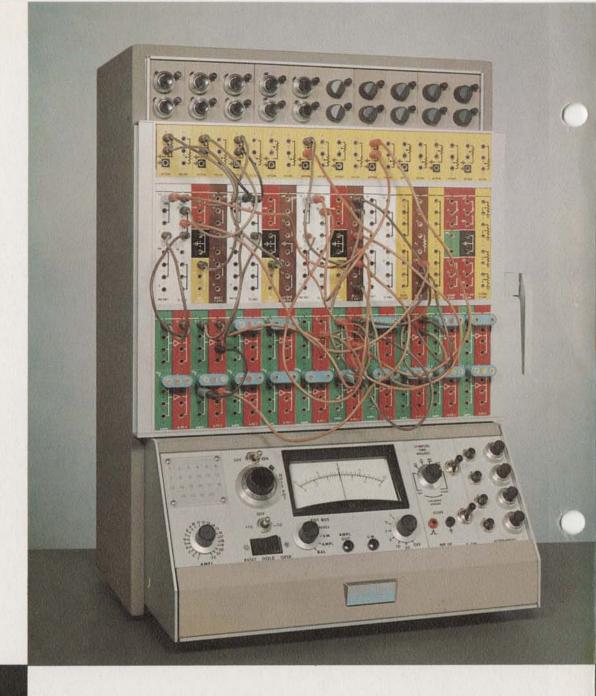
desk top analog computers...for the ultimate in high-speed, low-cost problem solving capabilities





TR-10

### TYPICAL APPLICATION

### Analog Simulation . . .

Analog Simulation is a dynamic method of solving the problems that confront the engineer and scientist daily — and EAI TR-10 and TR-48 Analog Computers provide an unsurpassed capability for simulating systems of all types. Analog computers help slash project costs by saving time and cost of materials in trial and error testing of prototypes or pilot plants. One engineer with a desk-top PACE® computer can be the equal of several men limited to conventional design tools; moreover, he can gain a unique insight of the dynamic performance of systems to produce a superior product.

Experimentation time and costs are similarly slashed. Ideas that were once too costly or time consuming to be tried can be "debugged" right on the computer. Analog computation actually stimulates creativity.

Pace TR-10 and TR-48 Computers provide.....

- High dynamic accuracy over the widest range of frequencies available in a desk-top computer.
- Excellent combination of real-time solutions and high-speed repetitive operation. Change from real-time to HSRO (500:1 time-scale change) is accomplished without program patching changes. Units offer fastest repetitive cycling rate available in desk-top computers.
- Fully transistorized design is field-proven (over 600 units in the field) for: Extremely high reliability Ruggedness Compactness Low draft non-heating components Cool operation no need for air-conditioning Insensitive to ambient temperature (35 to 120° F) Low power plugs into any wall socket.
- Complete line of computing components compatible with high-speed amplifier and best dynamic accuracy of any desk-top computer.
- Ultimate in programming ease and problem control developed over years of engineering experience on larger analog computers. Large, color-coded, easy-to-use pre-patch programming panels.
- Versatility with interchangeable plug-in transistorized computing components.
- Parameter changes dialed in simply change potentiometer settings, output changes are instantaneous.
- Central visual overload alarm.

## PACE® TR-48 Highlights



- 48 AMPLIFIER CAPACITY.
- WIDEST USABLE BANDWIDTH OF ANY DESK TOP COMPUTER.
- ITERATIVE SOLUTION AND MULTI-TIME SCALE CAPABILITY
   by individual control of integrators available on Patch Panel.
- 4 INDEPENDENT TIME SCALE CHANGES 1:1, 10:1, 500:1, 5000:1 available by automatic switching of capacitors within integrators and bottle plugs.
- SOLID STATE READOUT push button controlled; digital voltmeter permits readout of potentiometers for rapid setting and check, plus readout of amplifiers and trunks.
- REMOVABLE PATCH PANEL OFFERS ULTIMATE FLEXIBILITY and ease of programming. Color-coded by function; Modular; Bottle plugs for 70% of patching; ALL necessary terminations brought to front panel for complete storage of problems (including mode control relays, additional X10 time scale changes, inputs, outputs, etc.).
- COMPACT AND MOBILE, LOW POWER DRAIN sets on any desk and plugs into any 115V, 60 cps outlet. Power drain less than a 150 watt bulb.

The most complete desk-top analog computer available — solving sophisticated problems such as those requiring high-speed repetitive operation and iterative techniques with a capability equal to that of many console computing systems. The TR-48 is solid-state designed for long-life reliability — an expansion of the successful companion TR-10 computer, the first completely transistorized analog computer.

The TR-48 is available in any complexity, from a basic unit to simulate linear systems to a unit to provide the most complicated non-linear simulations.

All computing components plug in from the front for simplified system set-up, regardless of complexity. TR-48 computers are readily "ganged" and "slaved" for even greater extension of system capabilities.

Typical applications of the TR-48 are: system optimization, boundary value problems, model building — including portions of the anatomy for bio-medical investigations, rapid determination of stability of control systems, approximate computation and display of integral transforms, statistical studies requiring many solutions, and a wide variety of routine computational problems requiring multiple solutions.

Every operational feature of the TR-48 is human-engineered to the maximum to simplify operational training and the actual programming. Your present engineering personnel can learn to operate and program it without elaborate training, and discover the multiple benefits in shortcutting time to solution of their most intriguing problems while cutting cost in the engineering of optimum products.

### TYPICAL APPLICATION





### AERO SPACE

design of satellite stabilization system ■ system design on a canard aerodynamic control program ■ stability of V T O L aircraft ■ analysis of pointing servo stability ■ simulation of aperture of optical sensors ■ in-line computations on flight test data ■ study of effects of non-linearities in servo systems ■ calibration of operational aircraft systems

### BIO-MEDICAL

radiation dose distribution  $\blacksquare$  study of adrenal cortical steroid project  $\blacksquare$  chemotherapy study  $\blacksquare$  CO $_2$  Rebreathing study  $\blacksquare$  Carotid sinus study  $\blacksquare$  Simulation of human fetal system

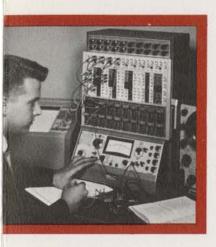
### CHEMICAL ENGINEERING

study of non-linearities in chemical reactors simulation of dynamic response of heated vessels limit of cycle studies study of pulsation dampening in process hydraulic lines simulation of temperature distribution in two dimensional systems calculation, on continuous basis, of conversion of catalysts

### FOOD TECHNOLOGY

study of fermentation kinetics

## PACE TR-10 Highlights



- PORTABLE ANALOG COMPUTER 15" x 16" x 24".
- UP TO 20 AMPLIFIERS, each programmable as a summer, integrator or high-gain amplifier for use with non-linear equipment.
- PATCH PANEL PERMITS PRE-OPERATION PROGRAMMING AND PROGRAM STORAGE.
- IDEAL FOR ON-LINE DATA PROCESSING.
- EXCELLENT TRAINING TOOL a full-fledged computer, easily carried from laboratory to lecture room.
- EXTREMELY LOW POWER DRAIN draws less than 60 watt bulb. Operates from 115V, 60 cps outlet.
- INCLINED CONTROL PANEL for easy, finger-tip control.
- BUILT-IN NULL VOLTMETER provides direct reading or precision null reading.

The PACE TR-10, the first all-transistorized desk-top analog computer, puts proven high-speed computation at the engineer's finger-tips. Though compact in size it is a full fledged computer, capable of solving many complex problems previously requiring scheduling on large computing systems. It offers up to 20 amplifiers plus components for addition, subtraction, multiplication, division, integration and generation of powers, roots, logs, antilogs and arbitrary functions — in one cabinet with no external racks.

The TR-10 is useful in solving problems in such diverse areas as servo-system design, heat flow, chemical reaction analyses, suspension systems studies and many other problems involving dynamic conditions.

With a TR-10 analog computer an engineer can explore problems as they occur — determining the feasibility of projects immediately — without leaving the desk. Simply turn a dial to feed in parameters, and the computer provides an instant, dynamic picture of the effect of each change. The endless drudgery of step-by-step calculation is eliminated — engineering data becomes alive.

### MILITARY

solution of 5 degrees of freedom equations in submarine control problem simulation of interior ballistics of a cartridge-actuated device

### NUCLEAR

start-up simulation of a stirred tank reactor simulation of the primary loop of a nuclear power plant poisonimetry studies

### PETROLEIIA

analysis of flow path of an oil globule cross correlation of seismic traces

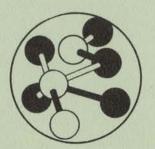
### RESEARCH

determination of electro-osmosis in soil

### TEXTILE

analysis of treating plant waste-disposal system

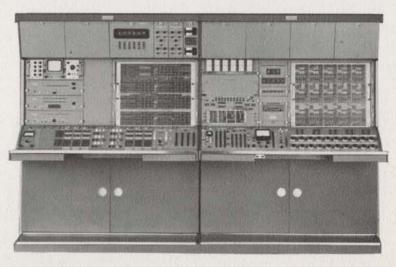






analog computers are backed by the unmatched experience of

EAI.



EAI HYDAC 2000—the first scientific computer system to provide a true integration of general purpose analog and digital computers—offering problem-solving capabilities superior to those provided by either type of computer alone or with normal linkage systems.



EAI maintains fully equipped and expertly staffed computation centers in key areas throughout the world for customer training in the latest computation techniques. Shown above is the computation center in Princeton, New Jersey. Others are in San Francisco, California; Los Angeles, California; Burgess Hill, Sussex, England; Brussels, Belgium.

# EAL

ELECTRONIC ASSOCIATES, INC. Long Branch, New Jersey

ADVANCED SYSTEMS ANALYSIS AND COMPUTATION SERVICES/ANALOG COMPUTERS/HYBRID ANALOG-DIGITAL COMPUTATION EQUIPMENT/SIMULATION SYSTEMS/
SCIENTIFIC AND LABORATORY INSTRUMENTS/INDUSTRIAL PROCESS CONTROL SYSTEMS/PHOTOGRAMMETRIC EQUIPMENT/RANGE INSTRUMENTATION SYSTEMS/TEST
AND CHECK-OUT SYSTEMS/MILITARY AND INDUSTRIAL RESEARCH AND DEVELOPMENT SERVICES/FIELD ENGINEERING AND EQUIPMENT MAINTENANCE SERVICES.

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