Analog Tutor/Computer

Equipment for teaching and research with Operational Amplifiers

These low-cost Precision Analogue computers from Limrose are ideal for advanced teaching and research.

You can use them for teaching principles of operational amplifiers, real-time control systems, solving differential equations with initial-value and boundary-value problems, active filters and analogue/hybrid computing. Precision computing elements ensure accurate computing to 1% or better, with integrator drift less than 2mV per second.

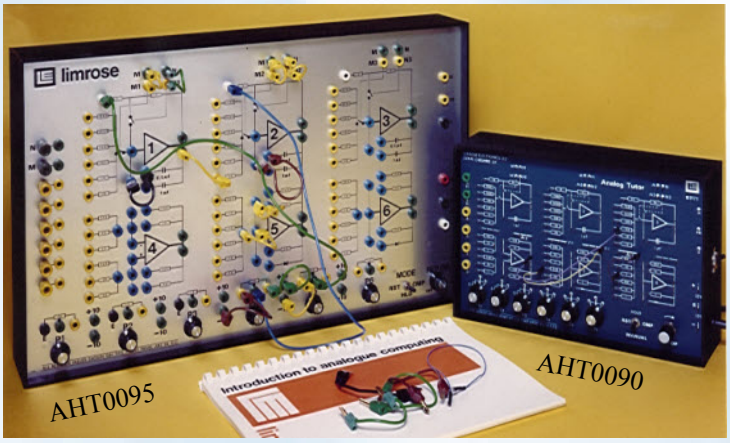
Advanced design

These units feature electronic mode control and are robust, safe and portable. They have many built-in **advanced facilities** not usually found in inexpensive equipment for teaching. These include **independent mode control of integrators,** single-shot and repetitive operation and **"slaving" of multiple units** from a single set of controls for accurate, synchronized switching between **Reset, Hold** and **Compute** modes for multiple units connected together. Integrator modes can be controlled using the manual switch, the built-in electronic clock for repetitive operation, or **external TTL-logic**.

Initial & Track/Hold

Each integrator has provision for initial condition input. In addition to normal operation, the integrators can also be used in **"track/hold"** and **"compute/hold"** modes for automatically solving both **initial-value and boundary-value** problems.

Low-cost Analog Computer uses electronic switching



Operational Amplifiers

These units use **precision operational amplifiers** for accurate, low drift, computing and incorporate:

3 Integrators, each with 6 inputs and initial conditions.
3 Summers, each with 6 inputs and selection of resistor or diode feedback.

One of the Operational amplifer module has both inverting and non-inverting inputs on the front panel.
Integrator drift is less than 2mV.per second.

Control System

* **Independent mode control by patching.**
* **Manual, Repetitive Operations, built-in clock**
* **Slaving of multiple units from one Master**
* **Digital Electronic Mode Control**
* **External control using TTL-compatible logic**

Component Values

AHT0090/5A : 1% resistors and capacitors
AHT0095D : 0.5% resistors and capacitors

Reference Supplies

AHT0090/95A : Zener stabilized +/- 10V
AHT0095D : Precision +/-10V within 5%

Choice of Systems and Accessories

AHT0090 uses 1mm solderless patch leads, which are supplied with the unit. The AHT 0095 has an anodised aluminium front panel and uses 4mm patch leads, *which must be ordered separately if required.* Both units are supplied with a copy of the 50-page A4 Manual, AHT0093.

PL0080 - Pack of 25 1mm leads, included with AHT0090.

PL0081 - 4mm patch leads, must be ordered separately.
AHT 0091 - A4 OHP Transparency, optional.
AHT 0092 - A4 Task Sheets for circuit planning, optional.

Comprehensive Instructions

The A4, flat bound, 50 page, illustrated manual is full of practical circuits for programming the analogue tutor. Experiments include linear position controller, ballistic missile problem, linear and non-linear feedback, track/hold operation and amplitude and time scaling. It also includes a section on simulating Transfer Functions (as used in control systems) by direct and parallel programming, and how to use operational amplifers for function generation.

Although these unit are **intended for teaching at the university level**, they can also be used to teach the basic principles of Op Amps. However for use in schools, or at a lower introductory level, you may find the simpler single-amplifier **Tutorkit TK-OT1A** as more suitable.

Size and Weights

AHT0090: 185mm x 290mm x 85 mm, 15 Kg
AHT0095A/D: 310mm x 520mm x 85mm, 5 Kg

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