

Actual size of the MC² chip is  with 10,000 transistors in its 34 mm² area. One thing the enlargement at left cannot reveal is the chip's translucence which, as the connoisseur of LSI knows, is a property peculiar to the sapphire substrate.

Hewlett-Packard announces the first microprocessor chip from its silicon-on-sapphire LSI technology.

Ordinarily, we prefer to reveal our technological advances through the end products that embody them. An exception is our new MC² chip. HP has developed a silicon-on-sapphire technology with complementary metal-oxide-semiconductor processing (CMOS/SOS) that makes possible a range of dependable, high-speed, large-scale integrated circuits. These circuits, of which the MC² (for Micro CPU Chip) is our first, are destined to play significant roles in products that will appear from time to time in these pages.

Two long-standing criteria in HP product development are invention and producibility: providing our customers with advanced products that offer dependable, high performance at a fair price. In these days and times, performance rests heavily on large-scale integrated circuits.

A case in point is the MC², the first chip produced by our new CMOS/SOS process.

The major distinction between SOS and other integrated circuit technologies is that instead of being formed in a wafer of bulk silicon, the circuitry begins with a thin layer of silicon on a sapphire substrate. Because CMOS/SOS provides superior dielectric isolation, circuit elements can be very closely spaced. MC², for example, is a complete 16-bit parallel microprocessor that contains 10,000 transistors in a 34 mm² area.

Low parasitic capacitance is a further advantage provided by the sapphire substrate, greatly improving the speed of LSI circuits. Thus our little jewel, which executes 34 classes of 16-bit instructions, can perform a full register-to-register addition in 875 nanoseconds, yet power consumption is typically only 350 milliwatts. Instructions tailored for maximum flexibility in handling a range of peripherals make the chip easy to incorporate in electronic or mechanical devices as a direct, high-speed controller.

An article on this new, high-density chip appears in the April issue of the *Hewlett-Packard Journal*. If you'd like to delve further into the properties of MC², mail the coupon. We'll gladly send you a copy.

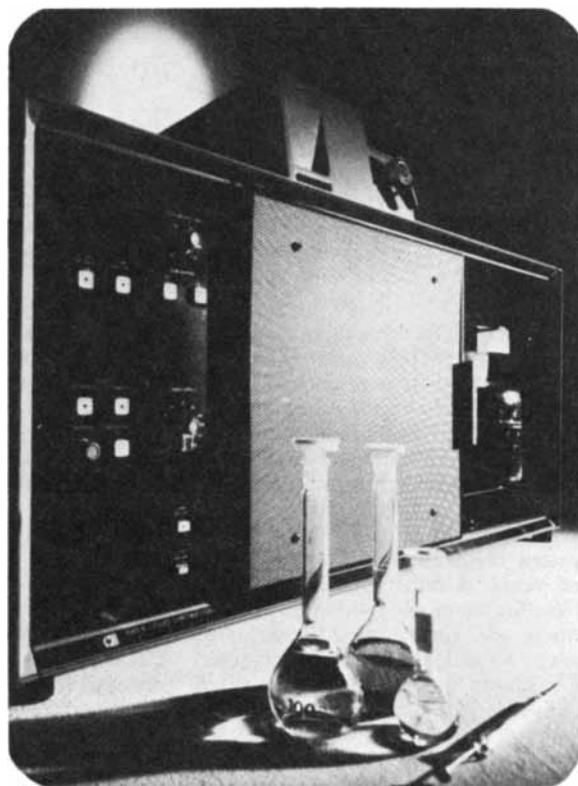
High-performance liquid chromatograph improves speed and accuracy of hydrocarbon group analysis in gasoline.

The HP 1084 integrates a high-performance liquid chromatograph (HPLC), digital processor, and printer/plotter in a single instrument. It automates the analysis from injection to final report of volume percent in a tenth of the time required by the traditional, standard method—and with greater accuracy.

One standard method used by petroleum refiners to characterize gasoline distillates by hydrocarbon groups is fluorescent indication adsorption (FIA). This method requires the analyst's constant attention throughout the analysis, which can run up to four hours for a single sample. And quantitative results can be biased by the presence of large amounts of olefins, diolefins, and light hydrocarbons.

A few years ago, Mr. J.C. Suatoni and some of his associates at Gulf Research in Pittsburgh, Pa., first applied high-performance liquid chromatography as an alternative approach to hydrocarbon group analysis. Now, with the microprocessor-based HP 1084, the method developed by Gulf Research scientists can be completely automated, making the analysis simpler, faster, and more precise than the FIA method.

The HP 1084 accepts all operating instructions on its control keyboard before the analysis begins. After the analyst pushes the start button, the instrument's microprocessor takes over full control: it automatically injects the gasoline sample; controls the operation of all aspects of the liquid chromatograph; plots the



chromatogram; computes the retention time and area of every peak; computes the normalized volume percent for each hydrocarbon group; and prints a detailed analytical report. When an automatic sampler is used, the HP 1084 can analyze a whole series of samples completely unattended.

At a price of \$23,500*, the HP 1084 brings to high-performance liquid chromatography the same kind of automatic operation, speed, and precision that the microprocessor-controlled HP 5840 brought to gas chromatography two years ago. Between them, the two instruments offer a choice of advanced analytical instrumentation for virtually any kind of organic material regardless of its separation characteristics, molecular weight, boiling range, and heat sensitivity.

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Please send me further information on

- MC² micro CPU chip
 HP 1084 high-performance liquid chromatograph

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*Domestic U.S. prices only.

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