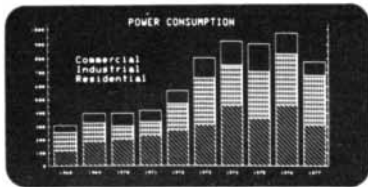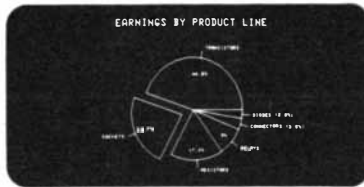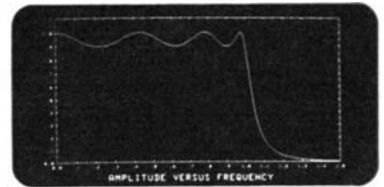# HP measurement and computer advances

With its multiple automatic plotting capability, the HP 2647 can display tabular data in formats of your choice, even if you

have no programming knowledge. A simple menu helps you key in data parameters, after which a single key-

stroke plots the data automatically. Charts and graphs like these can be created without CPU software help.
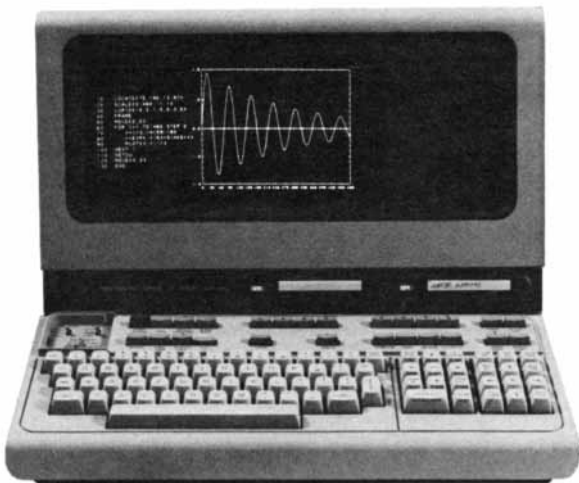
Meet HP's new intelligent graphics terminal. It's programmable, and it speaks BASIC.

The HP 2647 brings a new level of intelligence to our growing family of terminals. It combines user programmability in BASIC with sophisticated graphics capabilities to help you process and visualize complex data or detail an idea from concept to execution—with or without the assistance of a CPU depending on the complexity of the task.

By virtue of its microprocessor intelligence, plus 220K bytes of local storage on dual tape cartridges, the HP 2647 terminal is able to come up with some bright ideas:

■ Tabular data can be entered, the desired type of graph selected (bar, pie, X-Y Cartesian, or logarithmic), and the terminal will automatically label, scale, and plot the data for you.

■ A simple BASIC program in the terminal can reformat or post-process data from a CPU into an appro-priate graphic form, or check the accuracy of data prior to transmission to the CPU data base.

■ Processing loads can be effectively shared or distributed between terminal and CPU; for example, repetitive tasks can be performed by the terminal leaving the CPU free to perform complex tasks using its full power.

Other graphics capabilities of the HP 2647 include:
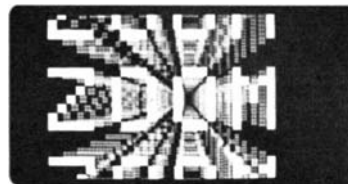
Zoom and pan

Magnify any area of the display up to 16 times (16×) to investigate or modify dense or complex areas. Pan in any direction for close-up viewing of the magnified display, without affecting display memory.
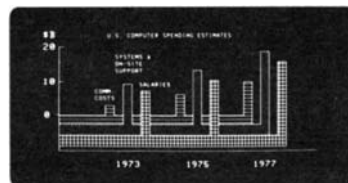
User-definable area shading

You can specify any pattern that an 8-by 8-bit cell can generate to make clear visual definitions of separate areas with similar shapes, as in bar charts and mechanical or architectural drawings.
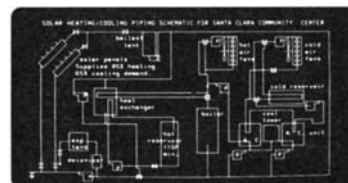
Independent display memories

Alphanumeric and graphic data can be shown independently or at the same time, as in this process control schematic. And because alphanumeric and graphic displays each have separate memories and cursor controls, you can change one without disturbing the other.

Price of the HP 2647 starts at $8300*.

extend your possibilities.

This new HP spectrum analyzer makes difficult measurements easy in the 20 Hz to 40 MHz range.

The addition of two technologies to that of spectrum analysis — frequency synthesis and microprocessor control — enhances the performance and simplifies the operation of the HP 3585 spectrum analyzer.

By portraying a signal's properties in the frequency domain, the standard spectrum analyzer can help measure linear and nonlinear circuit performance, distortion, modulation, frequency response, and many other properties. And while its spectral displays offer good qualitative information, the amplitude measurements derived from these displays are generally inaccurate. The HP 3585 combines synthesizer and microprocessor technologies to overcome this limitation, and to achieve some other significant benefits.

Measurement performance.

With a synthesized local oscillator based on a new type of phase-locked loop, the HP 3585 can enter center frequency and span settings with an 0.1 Hz resolution and $\pm 1 \times 10^{\pm 7}$ per month stability over the analyzer's entire range of 20 Hz to 40.1 MHz. This frequency precision and stability make it possible to use the narrowest resolution bandwidth, 3 Hz, for close-in analysis even at 40 MHz. Microprocessor control (an example of HP's on-going NMOS II microcircuit technology) provides ± 0.5 decibel accuracy over most of the -135 to $+30$ dBm amplitude range.

Ease of operation.

Microprocessor control also gives the HP 3585 user keyboard control of those functions with variable parameters such as center frequency, span, and reference level. All the information that defines the displayed spectrum is displayed alphanumerically at top and bottom of the CRT for quick interpretation or permanent record. Advanced microprocessor software gives the user the choice of either variable analog or precise digital control where appropriate.
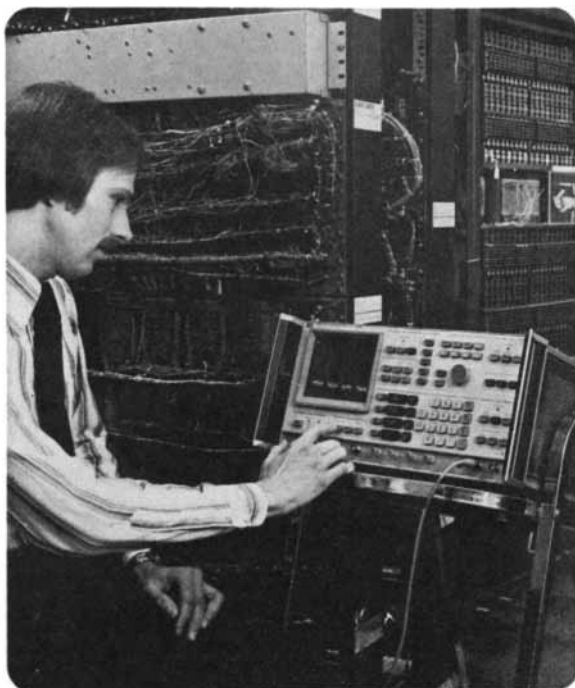
Programmability.

By connecting the HP 3585 to a computing controller such as the HP 9825 via the HP Interface Bus (HP-IB), measurement problems can be solved that would be impenetrable to analyzers alone. Three modes of operation in particular make this possible:

- Keyboard programming. Every front panel key on the 3585 can be programmed through the HP-IB.
- Analyzer as terminal. The controller can be used to place text on the analyzer's CRT, and the analyzer's keys can be used for input to a remote controller.
- Displayed manipulation. By transferring traces to, and loading traces from, the controller, analyzer results can be further processed, then redisplayed on the analyzer screen.

Those involved with audio, TV, telecommunications, and radio development will find the HP 3585 spectrum analyzer well worth its price of $17,500*.

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1502 Page Mill Road, Palo Alto, California 94304

For assistance call: Washington (301) 948-6370, Chicago (312) 255-9800, Atlanta (404) 955-1500, Los Angeles (213) 970-7500