HP 2700 Family

High Performance Color Graphics Terminals

HEWLETT PACKARD

field training manual

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Preface

Intense R&D has resulted in Data Terminals Division's most ambitious and powerful products ever. Your sales opportunities will expand into some of the most dynamic and highest growth markets in the computer industry.

DTD is proud to introduce the first members of an exciting new family of terminal products, the HP 2700.

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I. Product Summary

The HP 2700 is a family of high performance color graphics terminals offering models for both business and technical users.

Our technical customers will be impressed with its powerful local capabilities which make it possible to quickly implement demanding graphics applications which do not burden the CPU.

Our commercial customers will be delighted with the speed with which the untrained user can create customized, professional looking presentation graphics with the AUTOPLOT/2700 and PAINTBRUSH/2700 application software.

Feature Summary

Graphics Features:

- Local Vector Storage
- Local Graphic Object Storage
- Local Graphic Object Manipulation (i.e., scaling, moving, rotating,etc.)
- True Zoom & Pan
- 32K × 32K Addressable Resolution
- Up to 255 Simultaneous Views Into The Addressable Space

Local Application Software:

- AUTOPLOT/2700
  - — Friendly User Interface
  - — Pie, Line, Bar, Log, and Scattergram Charts
  - — Text Slide Design
  - — Combined Charts w/Text
  - — Interactive Real-time Changes
  - — Chart Spooler
- PAINTBRUSH/2700
  - — Friendly User Interface
  - — Freehand Drawing w/Tablet
  - — Aided Drawing
  - — Local Picture Editing (i.e., scaling, moving & rotating)

Color Features:

- 4096 True Colors Available
- 16 Colors Displayable At Once
- Simple Color Selection From Keyboard
- Up To 255 Definable Color Palettes

Alphanumeric Features:

- VPLUS/3000 Compatible
- Color Alphanumerics
- Alternate Character Sets Standard

Hardcopy Interfaces:

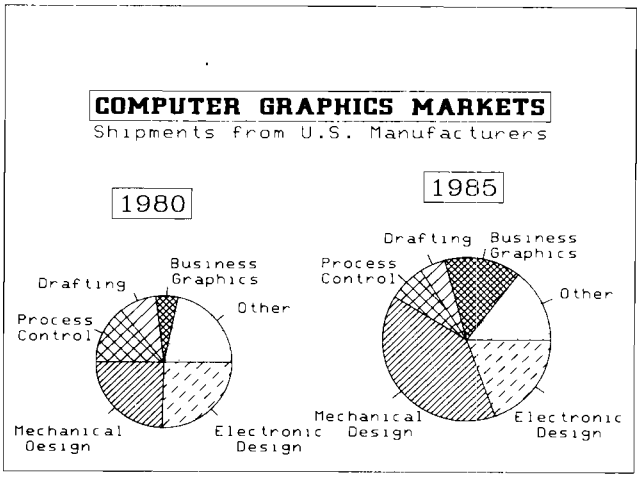
- RGB Video Interface to Cameras and Monitors (Optional)
- Shared Peripheral Interface to Plotters, Printers, and Discs. (Optional)
- RS232-C to Printer or Plotter (Standard)

II. Booming Markets for the HP 2700 Terminal Family

The HP 2700 is the right product at the right time.

Less than ten years ago the market place hardly knew what to do with computer graphics. Today they can't get it fast enough. This is why the HP 2700 is bound to be another HP success story. Many recent studies of the HP 2700's target markets all indicate there will be a strong growth in demand in both the technical and business graphics markets (see chart below). Most importantly the specific market niche the HP 2700 fills has the highest projected growth rate of all the exploding graphics market segments. A study by Strategic Inc. projected that:

> "TERMINALS USING 16 BIT AND 32 BIT PROCESSORS FOR CAD (COMPUTER AIDED DESIGN) AND OTHER DEMANDING GRAPHICS APPLICATIONS WILL SHOW A GROWTH RATE OF 150% PER YEAR"!

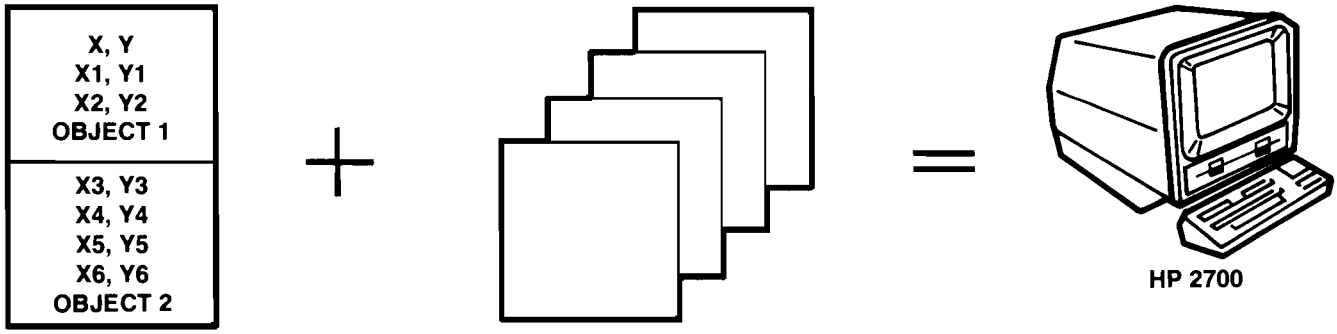


Source: *Strategic Business Services Inc.*

The technical graphics market as a whole is projected to grow at about a 30% annual rate. In the near future, use of equipment such as the HP 2700 for CAD will be a requirement in order for engineering companies to remain competitive and maintain adequate profit margins. The business graphics market is projected to grow at a 50% annual rate. Most of the growth (60% of it) is in the presentation graphics segment of the business graphics market. The HP 2700 with its application software will make a significant contribution to this market.

III. What is the HP 2700?

The HP 2700 is the combined advantages of two graphics technologies.



Vector Lists

- Distributed Graphics Intelligence
- Large Addressable Space

Raster Graphics

- High Quality Color
- Selective Erase
- Independent Alpha & Graphics

By storing information in both vector and raster form the HP 2700 has the advantages of both sophisticated local graphics manipulation and high quality color.

Raster Graphics — High Quality Color

When Data Terminals chose to use raster scan technology for its graphics terminals back in 1977, it did so with an eye for the future. The HP 2648 and HP 2647 were among the first raster displays on the market. Today due to its important advantages, raster technology has grown to be the most widely accepted and most preferred graphics display technology.

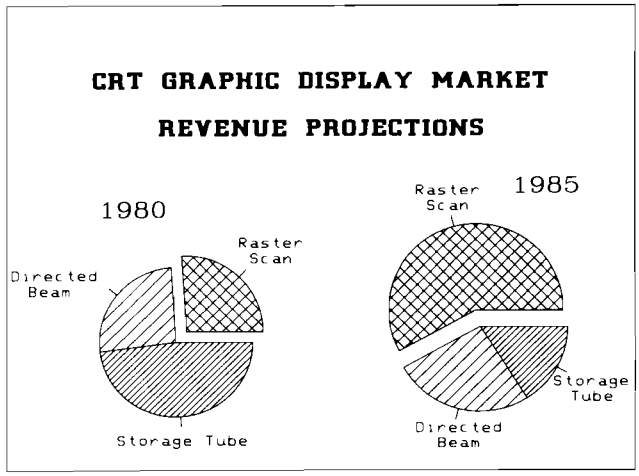
The advantages of raster technology over storage tube technology are:

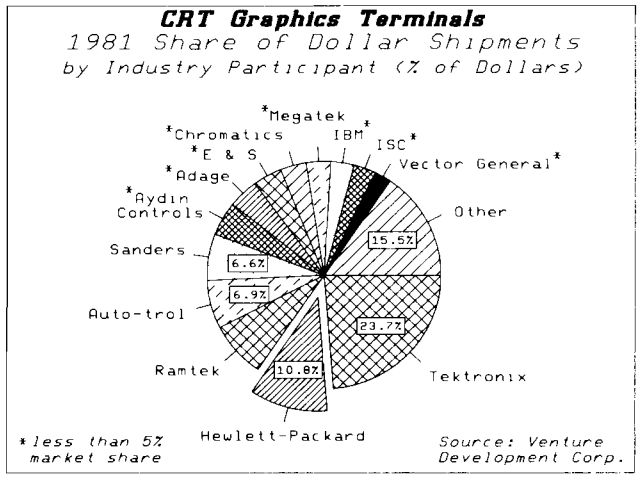
1. A bright, vivid, easy to read display.
2. Independence of alphanumeric and graphic display memories so that interactions with the CPU do not overwrite the graphics.
3. Selective erase — the complete screen does not have to be erased in order to update or change any portion of the display.
4. High quality color.

(See the HP 2648 field training manual for more details on graphics technology.)

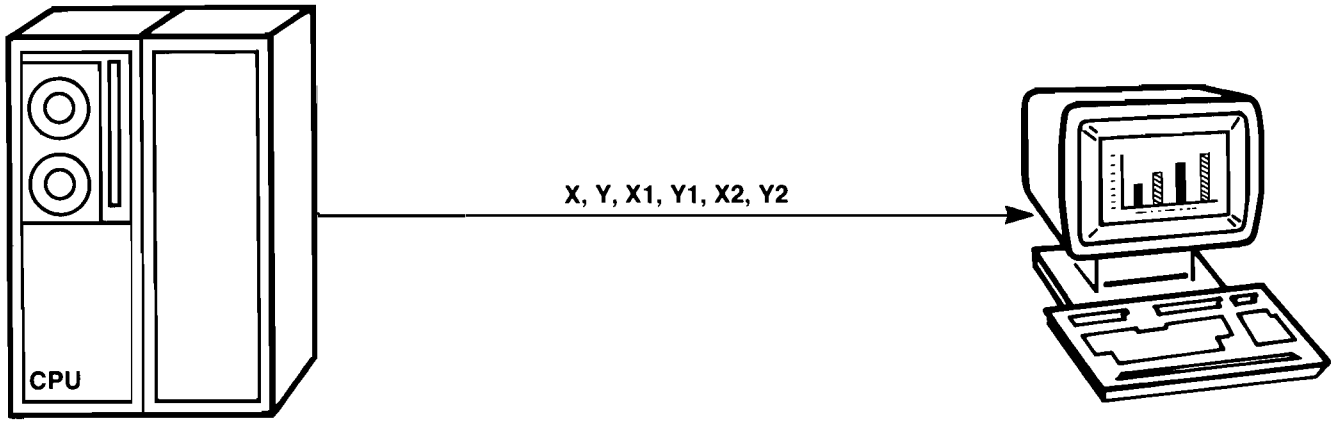
These raster capabilities led the HP 2648 and HP 2647 to be highly successful products. A recent market study shows HP to be the 2nd largest supplier of computer graphics terminals. Since the largest supplier uses primarily storage tube technology, by deduction, HP is the world's largest supplier of raster graphics terminals in the industry!

In short, we've got the leadership position in the fastest growing slice of a fast growing pie — we are where the sales are!

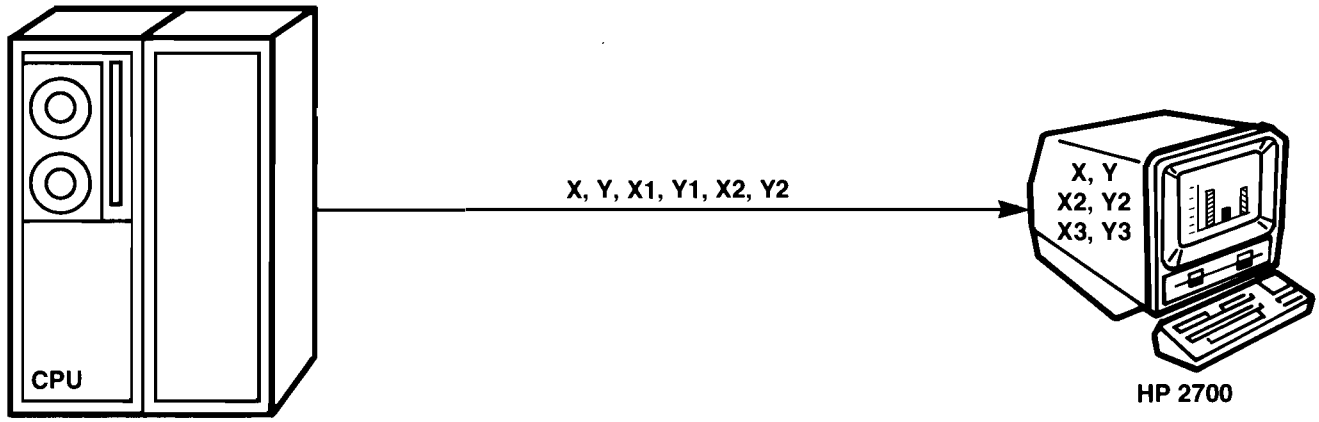




Vector List — Local Graphics Manipulation



Other HP Products — Immediate Rasterization of Vectors



HP 2700 — Vector List Storage and Rasterization

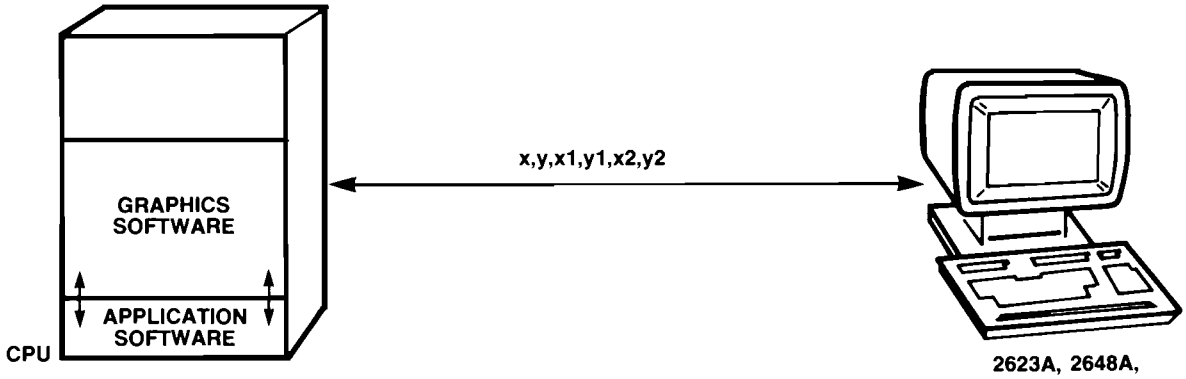
The HP 2700's vector list storage is the key to its tremendous local graphics processing power and distinguishes it from other Hewlett-Packard graphic displays.

As in our other products, graphical information is transmitted to the terminal as a series of X,Y coordinates. The HP 2700, rather than immediately converting the X,Y coordinates to a raster image, stores the X,Y coordinates in its vector memory.

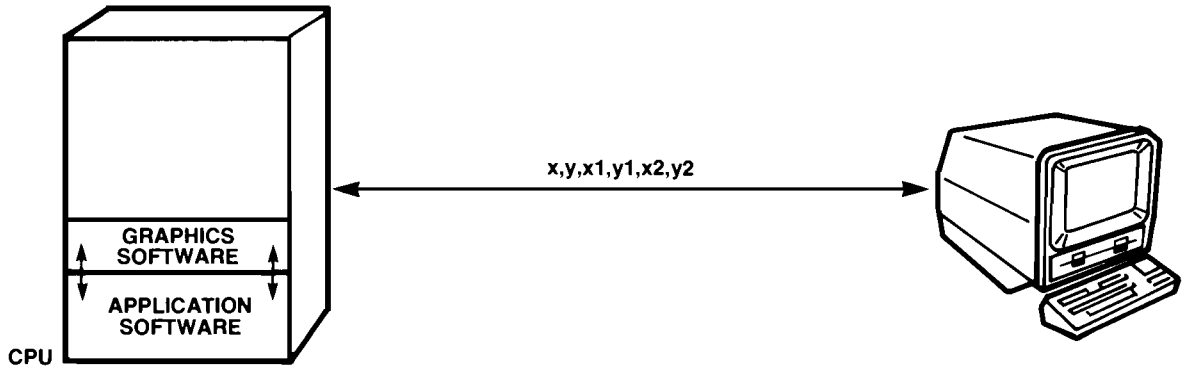
Vector List — Local Graphics Manipulation

Storing images in vector form in the terminal allows the terminal to perform a wide range of functions the CPU formerly had to do such as scaling, rotating and redrawing of images. This distribution of graphics intelligence to the terminal:

1. Dramatically increases performance.
2. Significantly reduces the strain on the CPU.
3. Reduces the amount of data which must flow over the datacomm line.
4. Reduces OEM's graphics software development time.



Centralized Graphics Intelligence



Distributed Graphics Intelligence

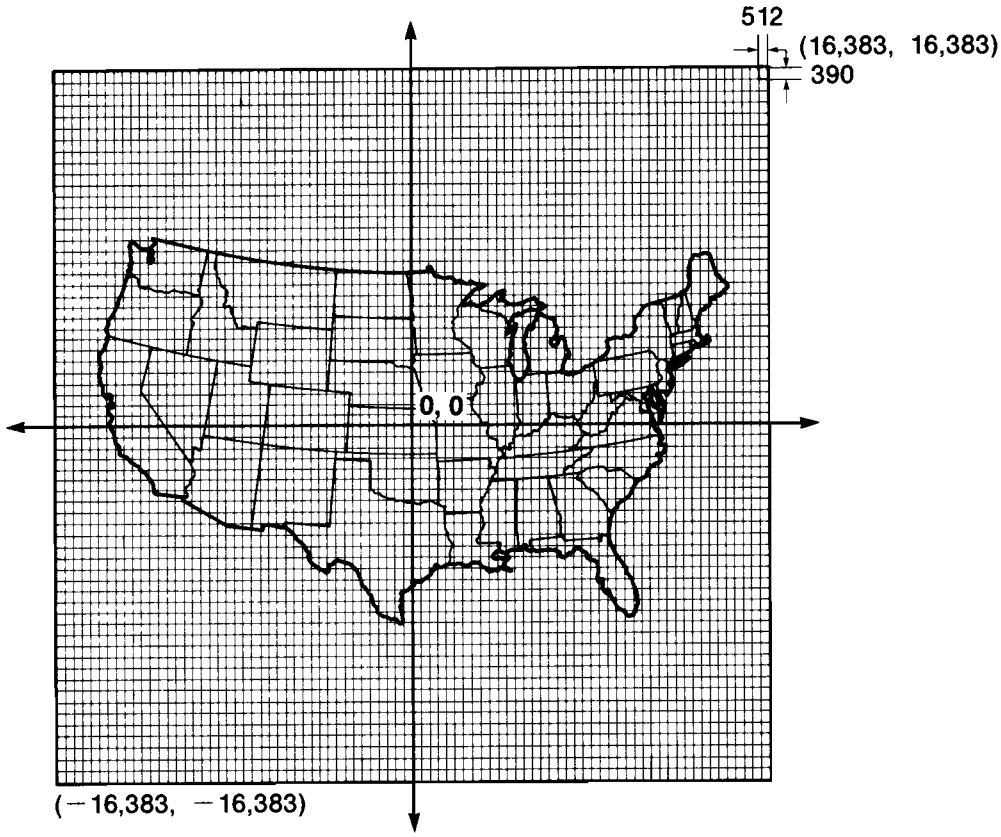
IV. Key Contributions

The HP 2700's advanced feature set results in a number of important contributions. This section will explain how the following contributions are made.

1. Complex Picture Storage
2. Local Graphics Manipulation Independent from Host
3. Flexible Easy-to-use Business Graphics
4. High Quality Color
5. Configurable to Many Applications

Contribution: Complex Image Storage

Feature: Over 1 Billion Addressable Points!!



Each square in the matrix represents one screen space of 512 × 390 dots in about 1/2 square foot.

Description:

The X,Y coordinates that are stored in the vector lists can have the values $-16{,}383 < X < +16{,}383$ and $-16{,}383 < Y < +16{,}383$. This is a total of more than 1 billion addressable points! More than 5000 individual screens (each 512 × 390) can fit into this 32,767 x 32,767 addressable space. This calculates out to more than 2500 square feet of space based on the screens dot resolution. Imagine how complex an image the HP 2700 can hold! With the vector memory expandable to 992K bytes (up to 200,000 vectors) there will be few applications which require more detailed storage capability. This feature alone can often cost justify the HP 2700 in graphics applications which have detailed images.

Advantages:

1. Very complex, detailed images can be stored locally.
2. A large number of images can be stored locally.
3. Designs do not have to be cut up into pieces due to limitations in size of the plotting space.

Benefits:

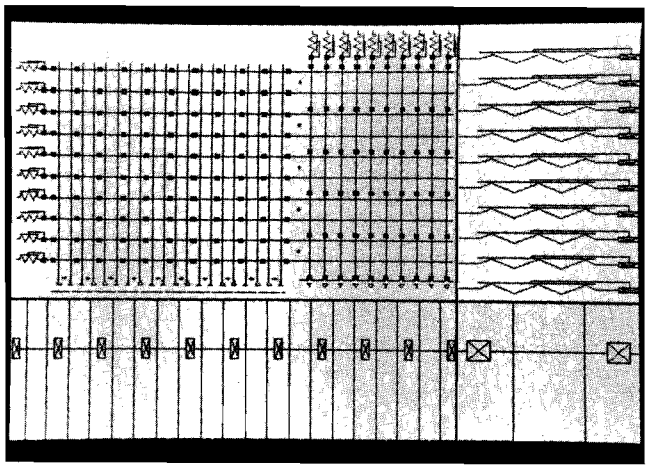
1. Fast access to a huge amount of information — increased user productivity.
2. Saves CPU time and therefore money.

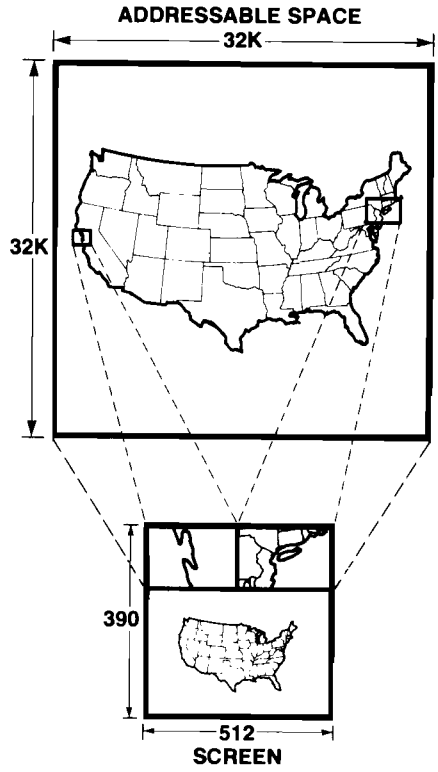
Applications:

1. In CAD applications the entire design can reside in the terminal ready for quick access without burdening a CPU.
2. In architectural design applications such as the design of a building, the entire blueprint can be stored in the terminal.
3. In process control applications, an entire factory floor plan can be stored in the terminal.
4. In presentation graphics applications, hundreds of charts could be stored simultaneously, ready for immediate recall.

Contribution: Complex Image Storage

Feature: Multiple Views





Description:

The HP 2700 allows up to 255 different portions of the addressable space to be brought to the screen simultaneously. Zooming and panning occur independently within each view. For example, the details of various locations of the addressable space can be viewed along side the entire addressable space as shown above.

Advantages:

1. More than one area can be viewed at a time.
2. Multiple degrees of resolution can be displayed simultaneously.
3. Separated portions of the plotting space can be brought together on the screen

Benefits:

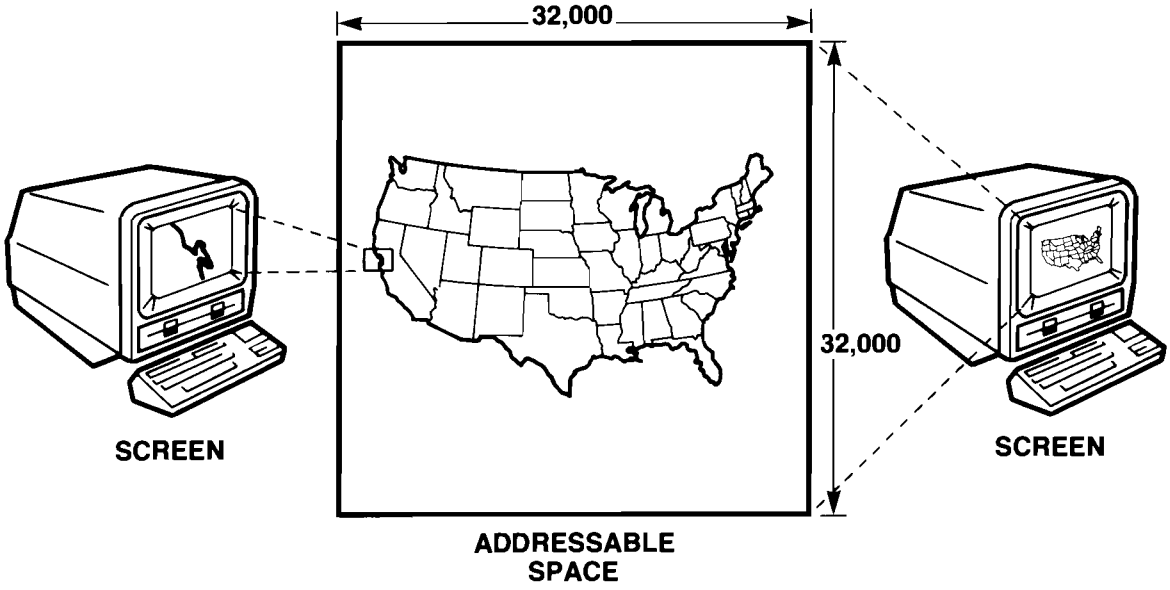
1. The user can be more productive by viewing multiple activities at once.
2. Little CPU time is needed to create multiple views.
3. More effective displays are possible with less programming effort

Applications:

1. In a process control application, all of the valves of a process can be displayed at once.
2. In presentation graphics, multiple graphs can be compared.
3. In a CAD application the entire design as well as a detailed portion can be examined

Contribution: Complex Image Storage

Feature: True Zoom and Pan



Description:

With its zooming and panning functions, the HP 2700 provides a simple user interface for selecting what part of the addressable space appears on the screen. With the spin of a thumbwheel the zoom capability allows selection of the desired magnification. The entire addressable space can be viewed at low resolution or small portions of it can be viewed with high resolution. This is a true zoom where previously unseen detail can be enlarged to cover the entire screen.

The panning feature lets the user look at any portion of the addressable space at a specific magnification.

Advantages:

1. The user can see the entire image at low resolution or see smaller pieces at high resolution.
2. Panning allows the user to roam over the entire plotting space.
3. Areas with a great amount of detail can be seen clearly.

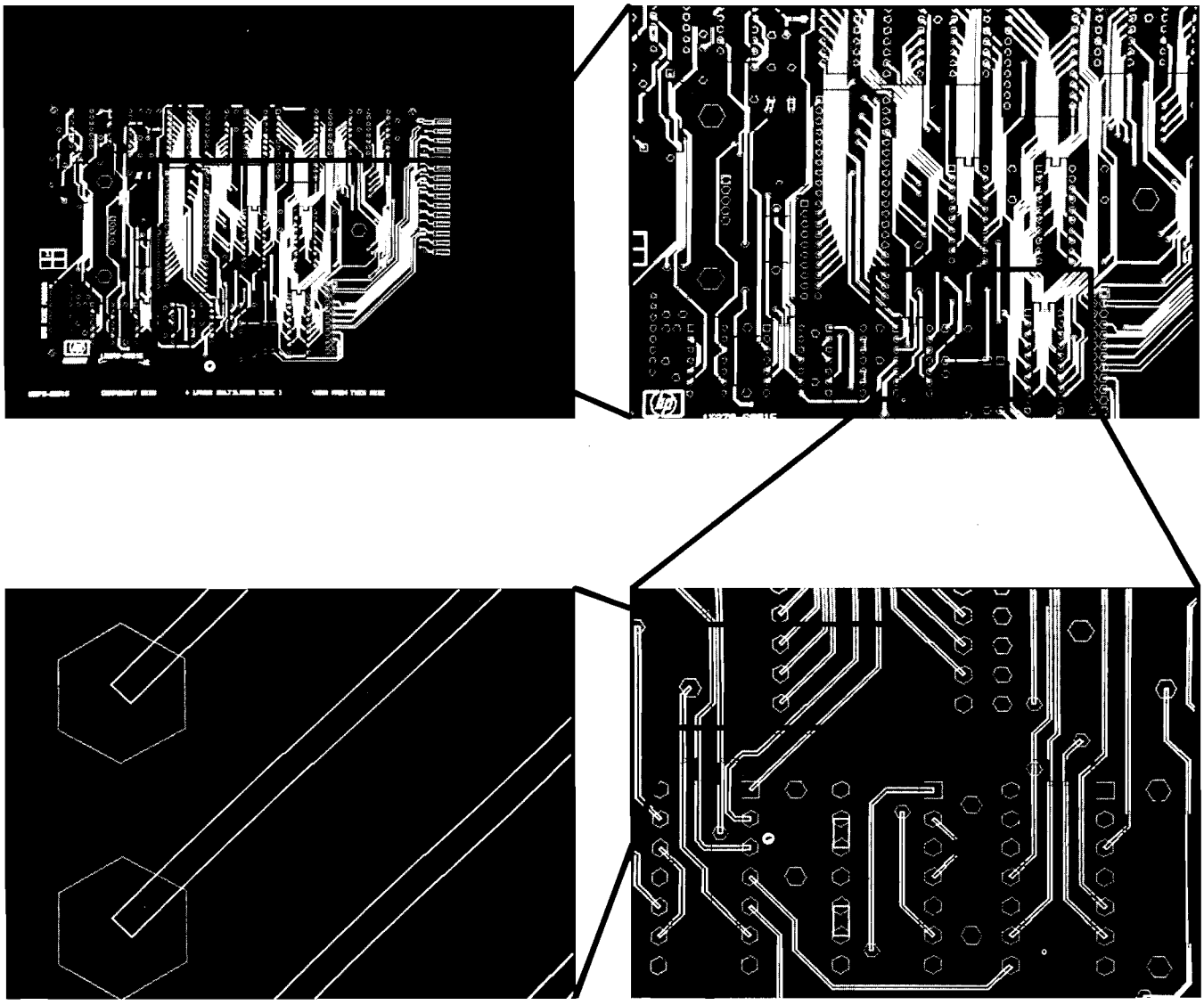
Benefits:

1. Less CPU power needed since the terminal does the image recalculations when zooming and panning — there is no need for the CPU to recalculate and retransmit images.
2. The user doesn't have to wait for the CPU to recalculate and retransmit the image everytime a different portion needs to be viewed

Applications:

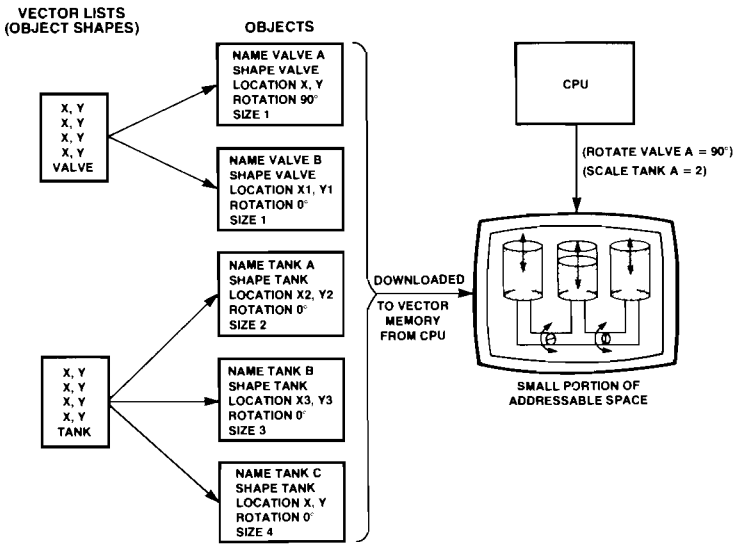
1. In CAD the user can view any portion of a design without waiting.
2. In a process control application, the operator could zoom into the area of the process that requires immediate operator attention.
3. In a chemical engineering application, the user could store the structure of complex molecules and zoom into the various bonds.
4. In presentation graphics, one could, in effect, "click through" multiple graphs as if in a slide carousel by zooming into one graph after another

Zoom Through Complex Designs



Contribution: Powerful Local Graphics Manipulation

Feature: Graphic Object Storage and Manipulation



Description:

The HP 2700's graphics objects consist of a name, vector list (shape), location, rotation and size. Once objects are downloaded the HP 2700 can locally manipulate them simply by changing one of the parameters. For example, in the process monitoring application above, as the fluid rises and falls in tank A, the CPU need only send the object name and the new fluid level. The terminal takes care of updating the graphical representation.

The CPU is left free from doing the graphics calculations!

Advantages:

1. Common object shapes need only be downloaded to the terminal once, even if used hundreds of times.
2. Everytime an object is modified (moved, scaled, rotated, etc.) the CPU need only send the object name and the new location, size, rotation, etc.
3. Objects can have English like names.

Benefits:

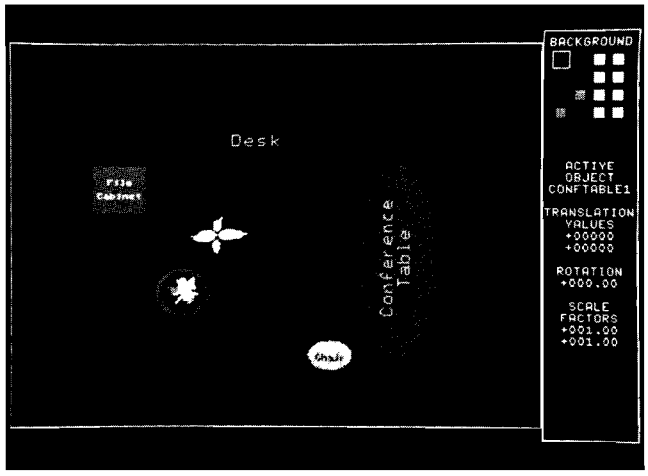
1. Sizeable decrease in CPU overhead means money saved.
2. Sizeable increase in speed of graphic creation or editing.
3. Efficient use of terminal memory — less hardware, lower cost.
4. System programmer's task is eased considerably.

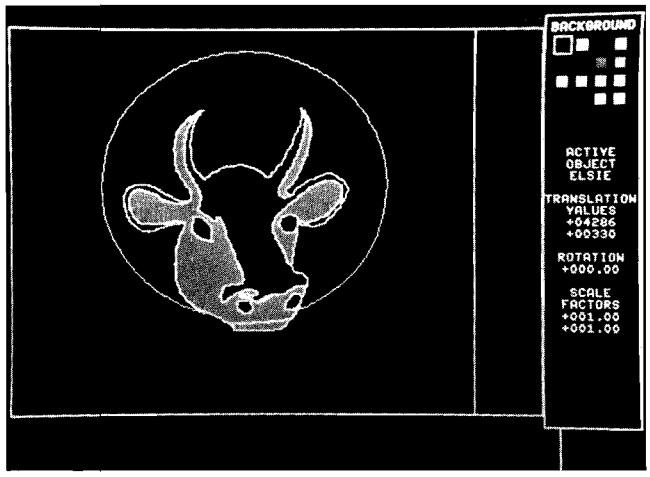
Applications:

1. In circuit design, electronic components can be defined as objects and locally moved into place.
2. In process control, pumps, valves and tanks can be defined as objects and updated in real time with simple commands from the host.
3. In presentation, graphics labels or drawings defined as objects can be moved, scaled and rotated interactively on the screen.

Contribution: Powerful Local Graphics Manipulation

Feature: PAINTBRUSH/2700 Application Software Pac





Description:

The PAINTBRUSH/2700 Application Software is a major contribution in the area of ease of use. It provides the non-programmer a high level user interface to local graphic manipulation.

Just point to an object using the graphics tablet or thumbwheel cursor controls, then select whether you want to move, scale or rotate it. As the manipulation is performed, you see it happen. The graphic editing capabilities of PAINTBRUSH/2700 also allows objects to be grouped together so that they may be manipulated as if one object.

Any type of picture may be locally edited whether it be a bar chart, factory floor plan, or PC layout!

Existing graphics applications can take advantage of all the graphics editing features of PAINTBRUSH/2700 with minor modification.

Advantages:

1. Ease of use.
2. Makes the HP 2700 features useful to a much broader range of people since no programming knowledge is required.

Benefit:

1. Since it runs off-line not a second of CPU time is needed,
2. Instant feedback saves user time and money.

Application:

1. In engineering applications all the parts of a design can be stored in an "object library" ready to be activated, moved, scaled, and rotated into place in the design.
2. In presentation graphics design commonly used drawings can be scaled, rotated and moved into place on the slide or overhead transparency.

Contribution: Excellent Color Quality and Usability

Feature: ■ 4096 Total Colors to Choose From
■ 16 Colors Displayable at Once

Description:

As you have seen the HP 2700 is much more than just a color terminal! However, its color capability is most certainly very impressive. The 50/60Hz non interlaced display provides a consistently bright and vivid image.

Not only does the HP 2700 display the primary colors and secondary colors but it can also display pastels, earth tones, and thousands of subtle shades without loss of screen resolution. In fact, the total number of true discrete colors to choose from is 4096.

Advantages:

1. Enhances person/computer communication.
2. Increased flexibility in subtle color selection.

Benefits:

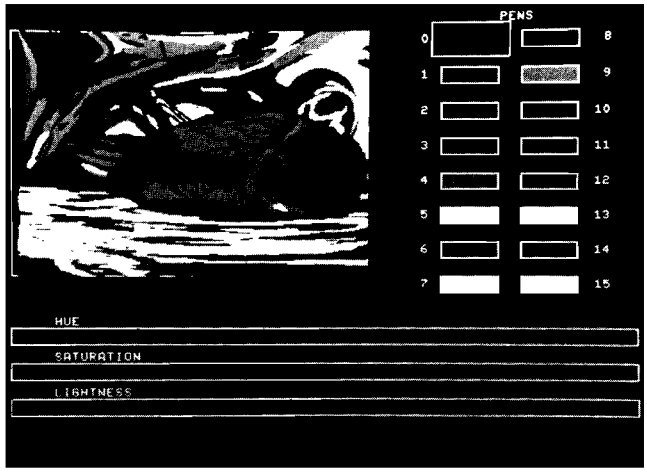
1. Increases management productivity/understanding — saved $.
2. Increases design engineer productivity — $.

Applications:

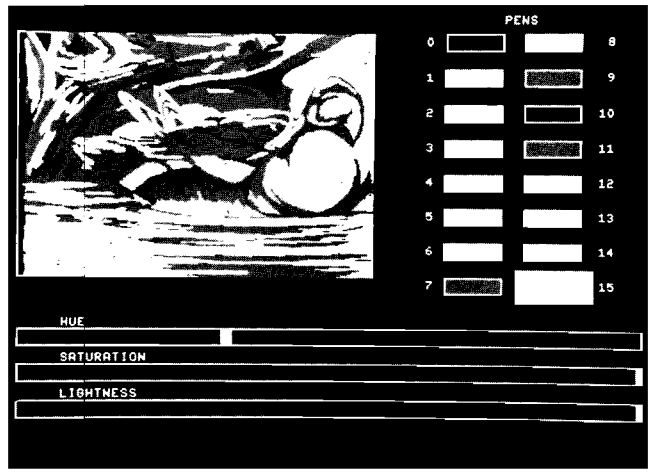
1. CAD — color is used to distinguish among parts of a complex drawing such as layers on a printed circuit board.
2. Business Graphics — color leaves a stronger impression and allows more factors to be viewed and understood than simple black and white or more limited color choices.
3. Position Monitoring — color objects in a military exercise or in a traffic control system. A dangerous situation can be highlighted by a bright red color.
4. Mapping — higher land elevations could be shown by increasing darker shades of green while ocean depths could use shades of blues.
5. Art — animated cartoon sequences.
6. Molecular Modeling — color enables researchers to visualize atomic and molecular relationships easily.

Contribution: Excellent Color Quality and Usability

Feature: Color Palettes



PALETTE 1



PALETTE 2

Description:

Of the 4096 selectable colors, any 16 can be displayed at one time. This set of 16 colors is referred to as a palette. Up to 255 different palettes can be stored in the terminal at one time, ready for immediate recall.

A unique contribution to the color graphics marketplace is the ease with which colors can be selected through the HP 2700's electronic palette.

Simply by pressing the color key, the currently active palette, the current graphic display and the red, green and blue scales are all displayed.

The user then selects which pen color is to be modified by using the graphics cursor thumbwheels (to be discussed later). Now the pen color can be modified by mixing varying amounts of red, green and blue interactively with the thumbwheels. As you mix the colors you see them change on the screen! It's so easy to get the colors you want. If you prefer you can even use the hue, saturation and lightness method of color mixing!

Advantages:

1. Easy to use — no need for guess work as when selecting colors with unintuitive RGB (red, green, blue) values.
2. Multiple palettes can be stored for easy recall at a later time.
3. What you see is what you want and what you get.
4. Palette storage make it easy to be consistent in your color selections for a particular application.

Benefits:

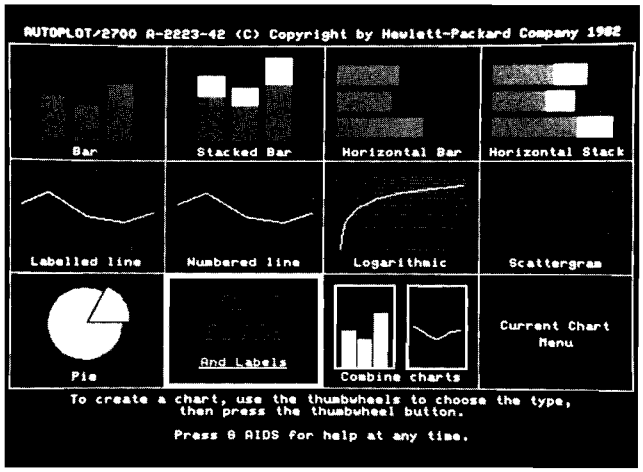
1. Time is saved in both color selection and color recall.
2. No CPU time is needed for color selection.

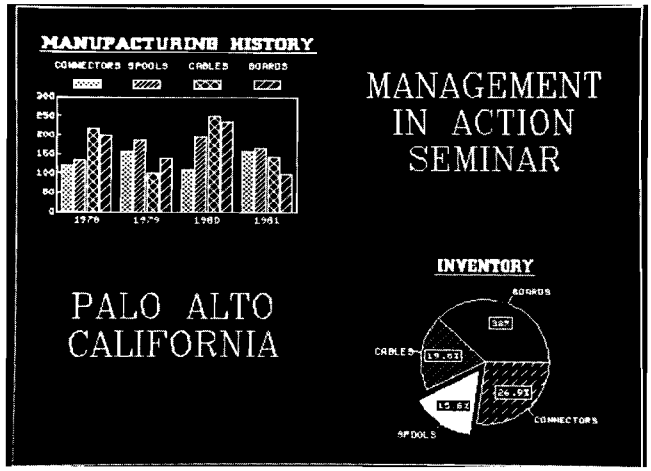
Applications:

1. For periodic management reports the same color will always mean the same variable in a graph.
2. The chart maker can select aesthetics groupings of colors for diagrams, charts, etc.

Contribution: Flexible, Easy to Use Business Graphics

Feature: AUTOPLOT/2700





Description:

AUTOPLOT/2700 is a powerful application software package which provides an extremely friendly menu driven interface for high quality decision support graphics including: pie charts, bar charts, line charts, log charts and scattergrams. In addition, text slides may be designed in a totally interactive environment.

AUTOPLOT/2700 uses the extensive features of the HP 2700 to its best advantage. In addition to the menu driven interface, there is an interactive interface which allows the user to point to a portion of a chart with the graphics cursor and then change its color, size, shading, font, etc., immediately in front of your eyes! Whole charts can be moved scaled and combined with other charts and text to form a complete graph.

Since all the chart types use the same data menu, the user can choose between a pie, bar, or linear chart and see the results in a matter of seconds.

Once a set of charts is ready for hardcopy, AUTOPLOT/2700's spooling capability allows unattended plotting of multiple copies of up to 17 different charts.

Advantages:

1. Easy to select the chart type which best fits the data.
2. Flexible graphics text — size, color, location, font.
3. Storage of many graphs simultaneously.
4. Ability to combine charts together and with text.
5. Interactive user interface.
6. High quality output to plotter or camera.

Benefits:

1. Users need not make costly time consuming software investments .
2. No CPU time is needed.
3. Can be used by anyone.
4. Low cost/slide.
5. Increased user productivity through fast chart generation.
6. Better presentation of data permits better decisions.

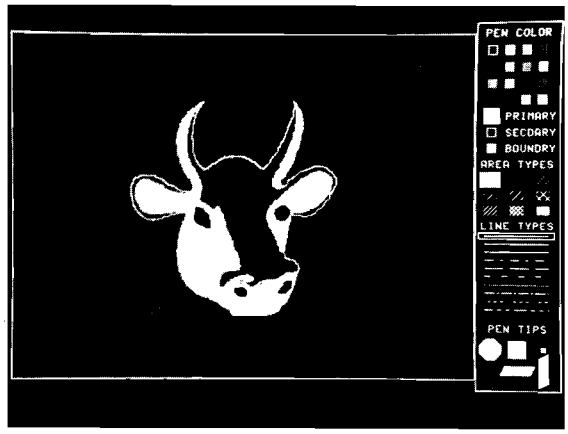
Applications:

1. INFORM/3000 can be used to pull the desired numbers from the data base and pass them to AUTOPLOT/2700 data menu for plotting.
2. Generation of periodic management reports.
3. Generation of one time only reports.

Note: Use of the application software packages requires ordering of the dual mini disc option. The mini-disc option is factory installed and not upgradeable in the field.

Contribution: Flexible, Easy to Use Business Graphics

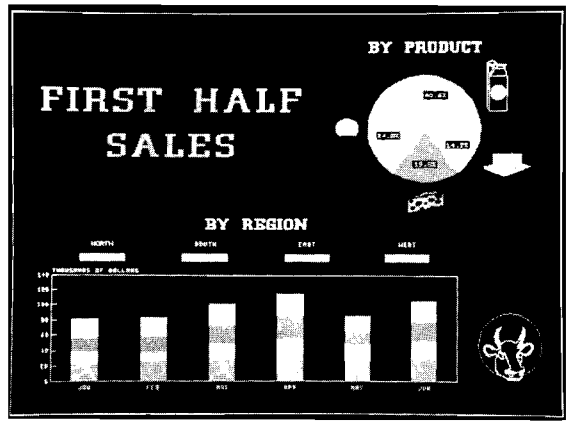
Feature: PAINTBRUSH/2700 Application Pac



Description:

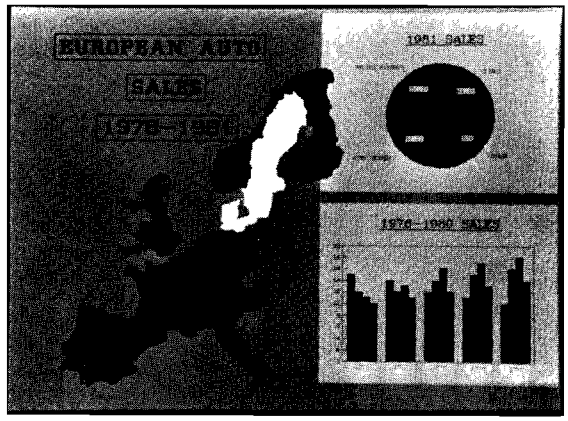
Another portion of the PAINTBRUSH/2700 Application Pac is the chart makers delight! It does for the creative chart maker what word processing has done for the typist. It allows the electronic entering, editing and storage of pictures.

Using the graphics tablet, the user can select the color and brush tip desired and then freehand draw as if using a paint brush on paper. If a mistake is made all one has to do is hit the delete button! For the less artistic person aids similar to a ruler and compass on graph paper are available. Straight lines, circles, rectangles and arcs are all available at the users fingertips to help build that perfect picture. Once an object is drawn it can be rotated, expanded, shrunk, and positioned with other objects to form a complete graphic picture. To take it one step further, the entire picture can then be scaled, rotated, etc.



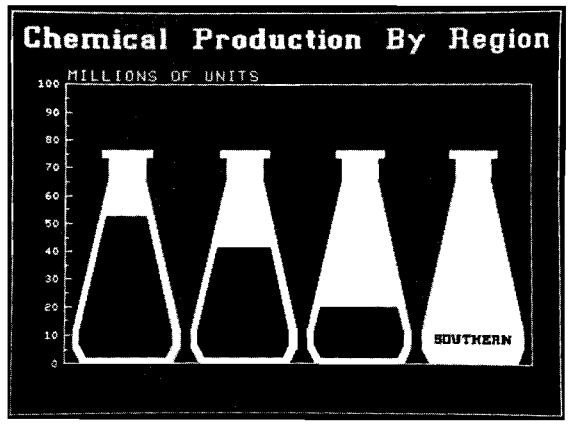
Advantages:

1. Objects are created electronically using the chart makers existing skills, no programming knowledge is required.
2. An object need only be entered once. It can then be used over and over again at different sizes, colors, rotations and locations in the same or different pictures.
3. Plotter and camera output available.



Benefits:

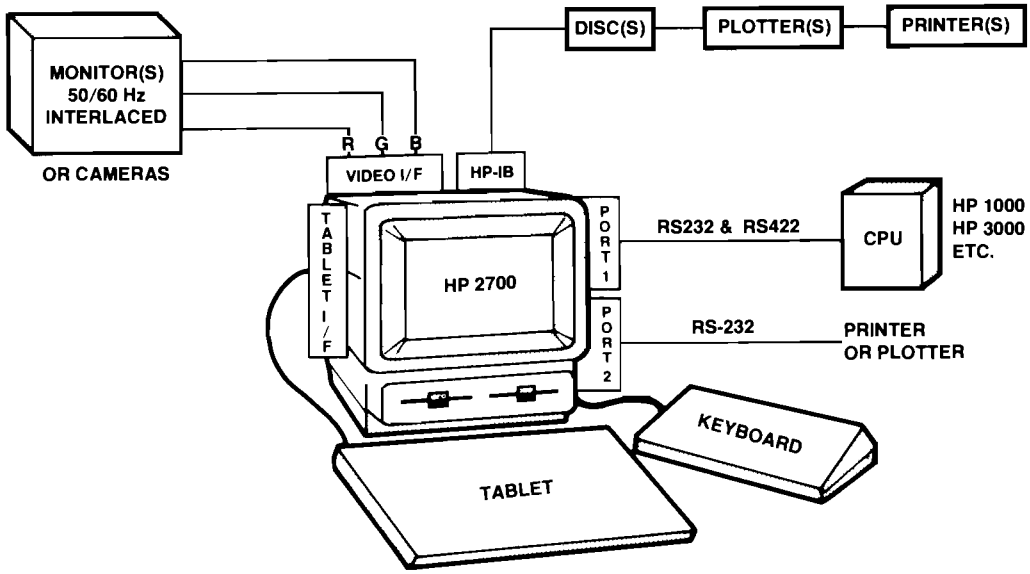
1. The cost to generate quality presentation graphics is cut dramatically.
2. Short learning curve since existing artistic skills are used.
3. Increased productivity of chart makers by providing electronic aids to typical chores (i.e.cutting and pasting).
4. Little or no CPU time is used.
5. Charts combining text and graphic pictures can be created with unprecedented ease and flexibility.
6. Slides matching management requirements can be more effective in presentations.



Applications:

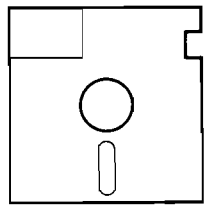
1. Generation of diagrams, flowcharts and drawings for presentations.
2. Entering of graphics objects for use by HP 2700 system application programs.

Contribution: Configurable to Many Applications



Feature: Integral Dual Mini Discs

- 270 K Bytes Each
- LIF Disc Format



Advantages:

1. Local storage of many different types of data.
2. Allows many tasks to be done off-line.
3. Allows data transportability to other devices which use LIF format (i.e., 2642A, 2647F, 9826A, HP 85, HP 87, HP 250).

Benefits:

1. User confidence in retention of data.
2. Relieves total dependence on CPU to get work done.
3. Data useful on more than one device.

Applications:

1. In situations where CPU is not required.
2. Storing of AUTOPLOT/2700 graphs, for future updating.
3. Storing of alpha, vector or raster data.

Important Note

Use of the application software (AUTOPLOT/2700 and PAINTBRUSH/2700) require ordering of the mini-disc option. The mini-disc option is factory installed and not upgradeable in the field.

Contribution: Configurable to Many Applications

Feature: RGB Video Interface

Description:

The RGB (red, green, blue) Video Interface allows the use of compatible devices such as Matrix or Dunn cameras (for photographic output) or color monitors (50/60 Hz interlaced) for remote viewing of the graphics image in one or more locations.

Advantages:

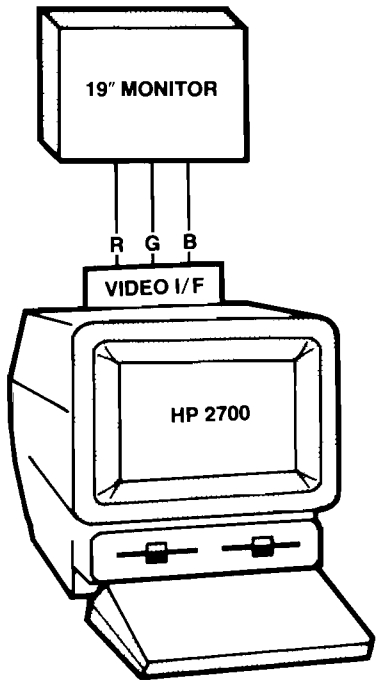
1. Up to 10 monitors can be daisy chained off of an HP 2700.
2. Provides the ability to interface to cameras for 35 mm slides, 8 × 10 glossies, Polaroid transparencies, etc.
3. Larger screens can be used to view the graphics.
4. Remote viewing of the graphics display is possible.
5. Film can capture the HP 2700's colors.

Benefits:

1. Lower cost for applications which require remote viewing (additional terminals need not be bought).
2. Polaroid provides almost instant color hard copy.

Applications:

1. Business graphics applications where photographic quality output is required.
2. Process monitoring applications where the screen must be seen from more than one location.
3. Design applications where a larger screen is desired.



Feature: Shared Peripheral Interface

Advantages:

1. One interface for multiple devices.
2. Less card slots are used.
3. Multiple terminals can share the same printers, and plotters.

Benefits:

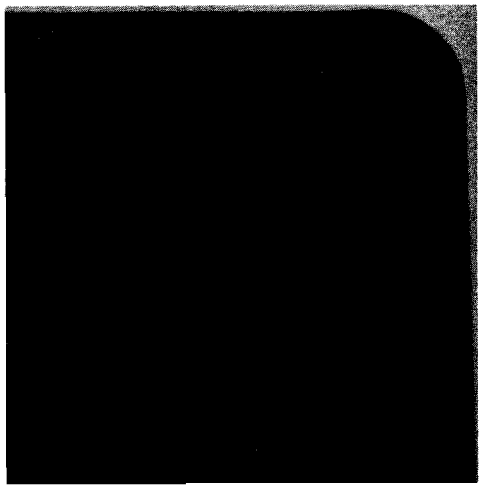
1. Decreased cost per workstation by sharing peripherals.
2. Decreased cost per terminal for multiple peripheral interfaces.

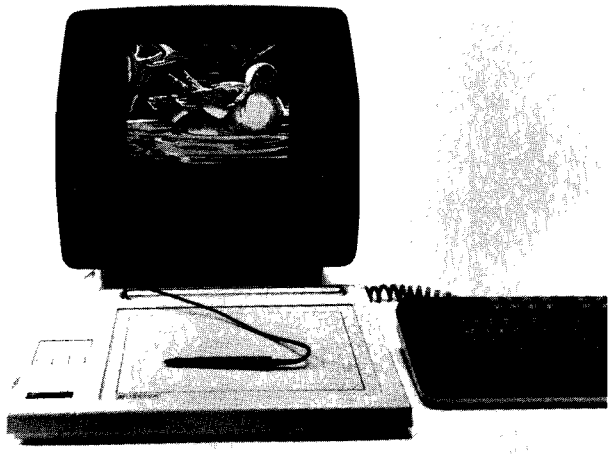
Applications:

1. In business applications where the user sometimes needs the quick convenience of raster hardcopy and other times needs the high quality of plotter output.
2. Design centers where multiple workstations can conveniently share output devices.

Contribution: Configurable to Many Applications

Feature: Graphic Tablet & Graphic Thumbwheels





Description:

The graphics thumbwheels mentioned earlier are a standard feature of all the HP 2700 terminals. They provide an easy and positive means of positioning the graphics cursor.

For applications which require a high degree of user interactivity. The HP 13273T Graphics Tablet provides the quickest means of direct cursor positioning. In many applications using graphics menus, the user can make a selection by simply pointing with the cursor.

Advantages:

1. The graphics tablet provides immediate access to a point in the raster rather than having to move through the raster to get to the desired point.
2. The tablet eases graphic editing and offers the most intuitive interface for freehand and aided drawing in PAINTBRUSH/2700.
3. Angular vectors are easy to enter with the tablet.
4. The graphic thumbwheels provide reliable, positive control of cursor positioning, particularly for applications where the vectors are primarily horizontal and vertical.

Benefits:

1. Fast interactive graphics input and manipulation.
2. Time is saved by reducing the need for laborious keyboard input.

Applications:

1. The chart maker uses the tablet to draw customized presentation graphics.
2. In design applications it can be used to position girders, resistors etc. into place in the design.

V. Where to Sell the HP 2700

The HP 2700 Models Strategy

The HP 2700 family of terminals solves problems which make it applicable to a number of applications in the business and technical markets.

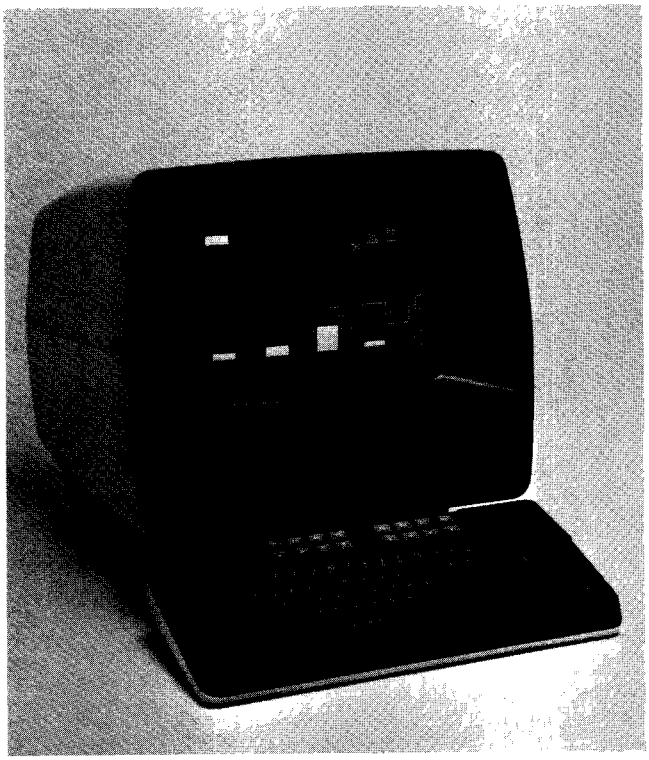
For demanding graphics applications where local control of the graphics memory can be used, the high-speed graphic manipulation capabilities of the HP 2700 can off-load the host CPU and provide the optimal solution. Sharing the graphics workload is the contribution all HP 2700 series terminals offer.

The HP 2700 is offered as four models. The base unit (Model 50) has the minimum configuration and allows the customer to select options to meet his needs. The other three models are tailored to specific application areas. We have configured a set of options and accessories which focus the product into these three applications. By targeting the product into specific markets, the customer can better understand how an HP 2700 model will meet his needs. The clear positioning of the product will make the terminal easier to sell and order. The four models are:

TECHNICAL MARKET

Model 50 — High Performance Color Graphics Terminal
- — Base Terminal
- — Multitude of Options

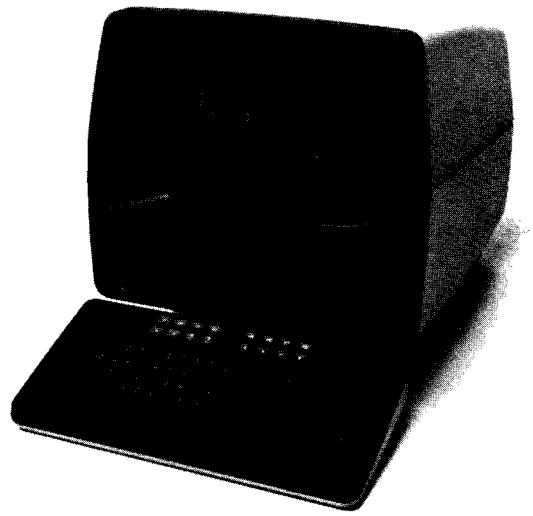
Model 55 — Technical Design Terminal
- — 224K Bytes Vector Memory
- — Double Buffered Graphics Memory
- — Graphics Tablet



BUSINESS MARKET

Model 60-Decision Support Workstation
- — AUTOPLOT/2700
- — 128K Bytes Program Memory
- — Dual Flexible Mini-Disc Drives

Model 65-Presentation Graphics Workstation
- — PAINTBRUSH/2700
- — AUTOPLOT/2700
- — 128K Bytes Program Memory
- — 224K Bytes Vector Memory
- — Double Buffered Graphics Memory
- — Dual Flexible Mini Disc Drives
- — Graphics Tablet



Where to Sell the HP 2700

The Technical Market

The Technical Computer Graphics Market is one of the fastest growing, undersold markets in the computer industry and the HP 2700 puts you right in the middle of it!

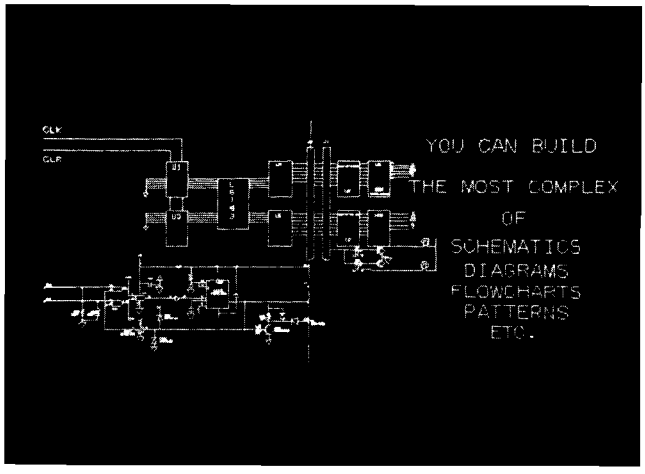
The high-performance capabilities of the HP 2700 make it well suited to a number of technical applications including:

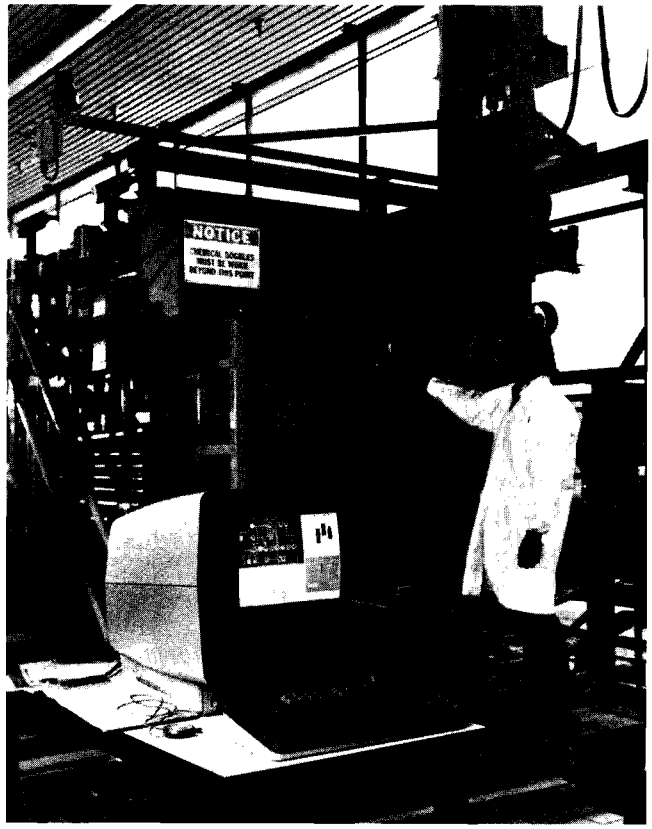
1) Computer Aided Design
2) Process Monitoring
3) General Technical Applications

The growth of these markets is expected to be from 1 Billion Dollars in 1980 to almost 4 Billion dollars in 1985!

In most all of the technical sales situations the primary advantages of the HP 2700 will be:

1) Immediate Access to Large Amounts of Detailed Graphical Data
2) Quick Picture Editing (i.e., ability to distinguish and manipulate local graphic objects)
3) High Quality Color
4) Elimination of graphics burden on CPU





Potential Customers

Today only one out of four of all potential customers of technical computer graphics applications have been sold.

Due to the specialized nature of applications in the technical market, our primary customers in this market will be:

1) SOFTWARE OEM'S WITH GRAPHICS APPLICATIONS

2) LARGE COMPANIES DEVELOPING APPLICATIONS FOR INTERNAL NEEDS

Where to Sell the Model 50

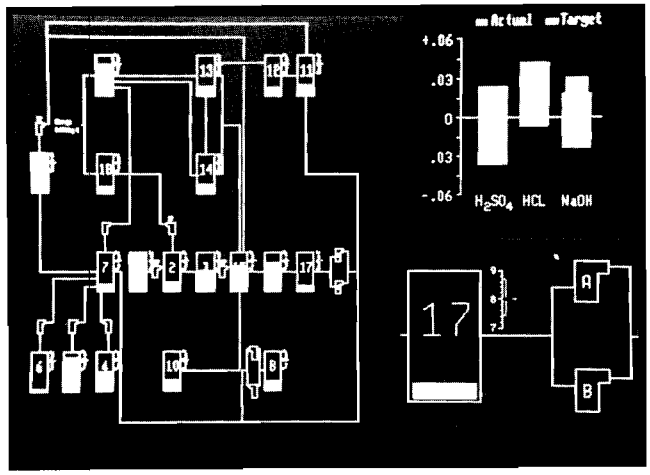
Model 50 — High-Performance Color Graphics Terminal

The Model 50 is a functional base level unit, excellent for applications which use a powerful color terminal to display graphics generated by the host.

The Model 50 can be ordered with any of the many available options. It offers the utmost in configuration flexibility.

Target markets for the Model 50 are:

1) OEMs
2) Process monitoring applications
3) General technical applications



HP 2700 Model 50 in the Process Monitoring Market

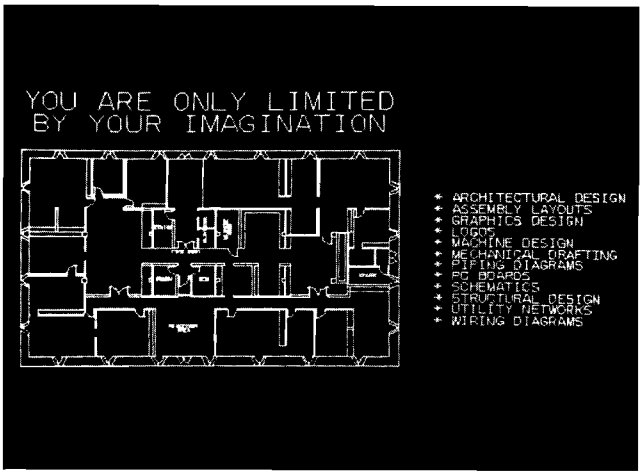
Process Monitoring Applications require real-time updates of hundreds of variables. The variables are usually temperatures, pressures, volumes, valve positions, etc. The moment a potential problem is detected the display must quickly draw the technicians attention to it. A delay in the screen update could mean a tank overflow, wasted materials or worse.

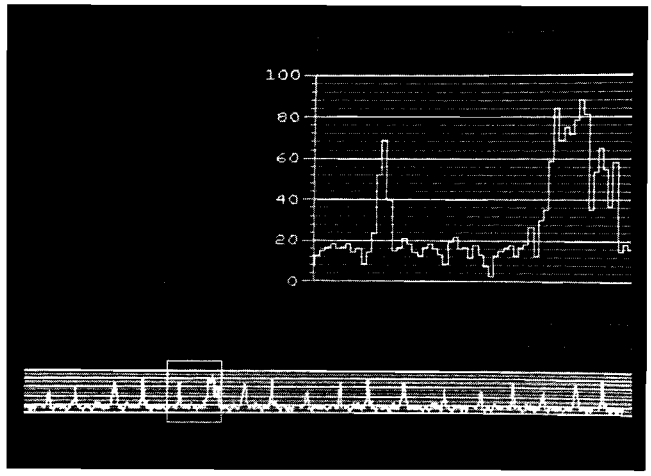
Currently many processes are monitored using huge panel displays costing upwards of $100,000. Here are some ways the HP 2700 can solve this markets needs more efficiently:

1. All of the applications status displays can be stored locally in terminal, (hundreds of them)! Ready for immediate display. There is no need to wait for the host to send down a new image. It's already in the terminal!
2. The large addressable space can be used to store even the most complex of process flow diagrams.
3. Real time updates are possible since local objects such as tanks, valves, etc., can be stored in the terminal. To open a valve graphically on the screen, the CPU would only have to send the valve's name and the angle to turn it. The terminal takes care of the rest. Without local object manipulation the CPU would have to recalculate the image and resend all the coordinates. The same is true for all the hundreds of variables being monitored.
4. Multple views can be used to focus in on a particular tank while still keeping an eye on the entire process. If a technician wanted to check all of the valves in a process, no matter where they are, the multiple view capability could bring up to 255 of them together on the screen at once.
5. Color, of course, could be used to bring immediate attention to a problem area. The HP 2700 can change the color of an object with a short simple command from the host. Again, the entire object would not have to be retransmitted in a differrent color.
6. Reliability is also a major issue in this market. A hardware failure could shut down an entire plant. H.P.'s strong reputation in this area will be important.
7. The ability to daisy chain large monitors off the HP 2700 is also important in some process control applications. This capability allows the process to be viewed from many locations and at further distances from the controls.
8. A portion of the large addressable space could be used to store large amounts of historical data say the last 24 hour period plot of pressure vs. time.

Where to Sell the Model 50

The HP 2700 in the General Technical Market





The high performance capabilities of the HP 2700 will undoubtedly lend itself to the opening up of many new application areas. All it takes is an understanding of its capabilities and a little imagination.

Here are a few examples of how some potential customers we have spoken with would like to use the HP 2700.

COMPUTER AIDED TESTING

An aerospace company is interested in the model 50 as a test technicians workstation, configured with an HP1000 and HP test equipment.

The large addressable space would be used to draw huge diagnostic flow charts and schematics. This would save the technician from fumbling through multiple sets of manuals. As the test equipment detects circuit faults the terminal could graphically point the technician to the problem component by flashing it in red. It could even tell the technician which leads to connect to probes for further testing.

An application such as this could easily double a test technicians productivity.

STORAGE OF MANUFACTURING DATA

An OEM is going to buy HP 2700's for use as an electronic strip chart recorder. Their customers application requires fast access to lots of data. The large addressable space will be used to store the previous 72 hours worth of data from a manufacturing process graphically.

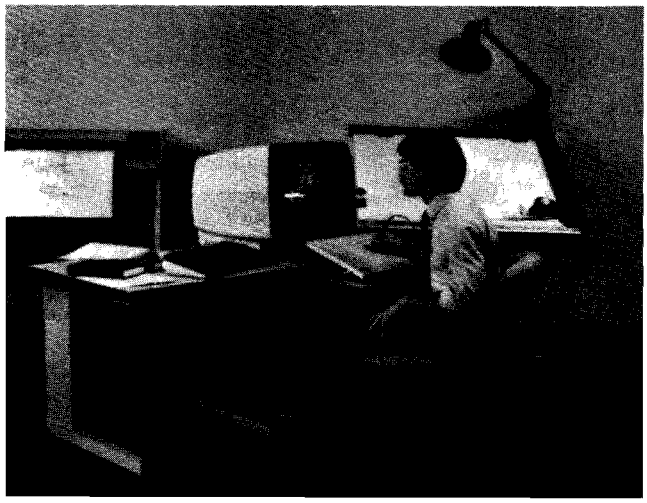
TELEMETRY NETWORK MONITORING

A regional office of AT&T has interest in the HP 2700 for monitoring of its regional telemetry network. The HP 2700's ability to store their entire network in complete detail and then zoom into sections for status checks is of great interest. As soon as a node in the network has a problem the operator could re-route around the node and call in a repair crew.

The list of potential applications is endless but here are a few more of the common ones:

Mapping
Molecular modeling
Mobile objects positioning

Where to Sell the Model 55



Model 55 — Technical Design Terminal

In addition to the high speed local graphics manipulation capability of all the HP 2700 family, the Model 55 has 3 more ingredients crucial to the CAD market.

The Model 55's graphics tablet offers the most often demanded graphic input device in the CAD market. Application programs can be written which free the user from tedious keyboard input by making use of the easy cursor movement afforded by the graphics tablet.

Also many design applications involve very complex drawings. For this reason the technical design station comes standard with 224K bytes of vector memory. The greater the complexity of the drawings, the greater the need for an HP 2700.

Since most design applications involve a great deal of zooming and panning, double buffered graphics memory is included with the Model 55. Double buffered graphics eliminates irritating screen redraws by providing a hidden graphics memory for redraws to occur in. Zooms & pans occur smoothly on the screen thereby reducing user fatigue.

The Model 55 in the CAD Market

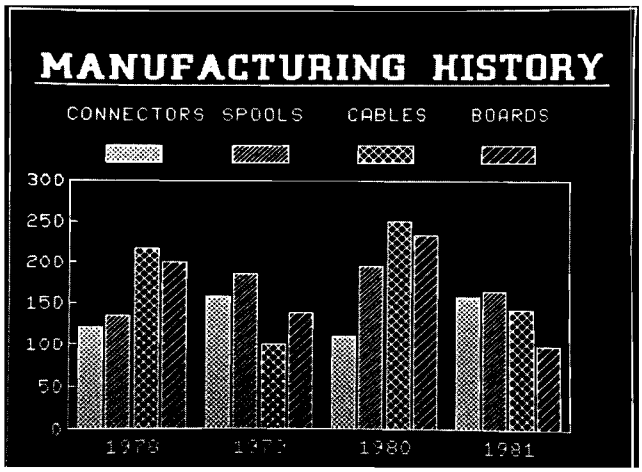
The CAD segment of the terminal market can be divided into the following groups:

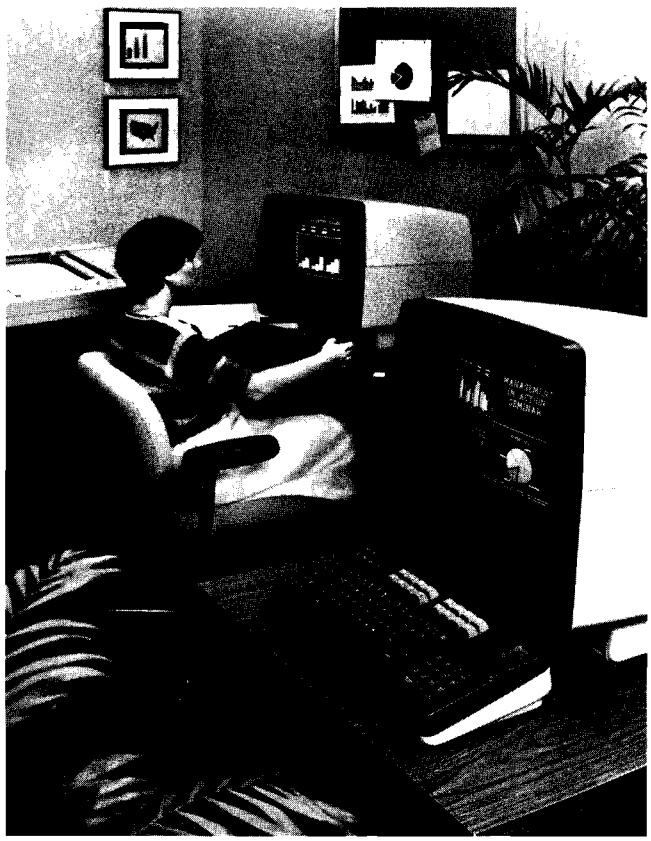
1) Electronic Design
   — Schematic Drawing
   — PC board layout
   — IC design
2) Drafting
   — Architectural Design Etc.
3) Mechanical Design

The HP 2700 fits well into the electronic design and drafting applications. Many mechanical design applications will require more screen resolution. However, the terminal's high addressable resolution is far better than any screen can provide. Through zooming and panning the HP 2700 offers a possible solution to some mechanical design applications.

Most design applications involve a technician or design engineer who spends the majority of his day interacting with the design application program. The HP 2700's local capabilities leave the CPU free to help make design decisions while providing the graphics power to keep pace with the user. CAD applications reduce design time thereby saving money and getting new designs to market faster. CAD also provides a more error free design.

Where to Sell the Model 60





The Business Graphics Market

In 1980 U.S. shipments of business graphics equipment were $75,000,000. This market is expected to grow to $600,000,000 by 1985. The HP 2700 with its startling capabilities is bound to be one of the most talked about products in this market.

Venture Development Corporation predicts the number of graphic terminals used in management information applications will double this year and next. By 1983 one out of every 2 graphic terminals shipped will be for business applications compared with only one in ten in 1980.

Decision Support Workstation

The Model 60 is a Decision Support Workstation with the local intelligence for quick and easy production of high quality business graphics in either a standalone environment or on-line to a data base.

Selling your customer an HP 2700 Model 60 could be the best thing you could do to increase their profits, for example:

> "Officials at General Mills were able to avert a major production foul-up using business graphics. Computer generated graphs indicated a possible shortfall in the production of 'Crispy Wheats & Raisins'. When disparate bits of sales and production figures were pulled together into an easily readable picture that compared the data with managment projections, the liklihood of a shortfall was made clear. General Mills quickly ordered additional overtime shifts and thus avoided a shortage when the product was introduced."
>
> Business Week June 16, 1980

The Model 60 includes dual integrated flexible mini-disc drives for loading AUTOPLOT/2700 into its program memory and storage of charts and chart data.

For color hardcopy the standard second RS-232 port is available for RS-232 plotters and printers. If multiple peripherals such as plotters, printers and fixed discs are desired, an HP-IB interface is also available.

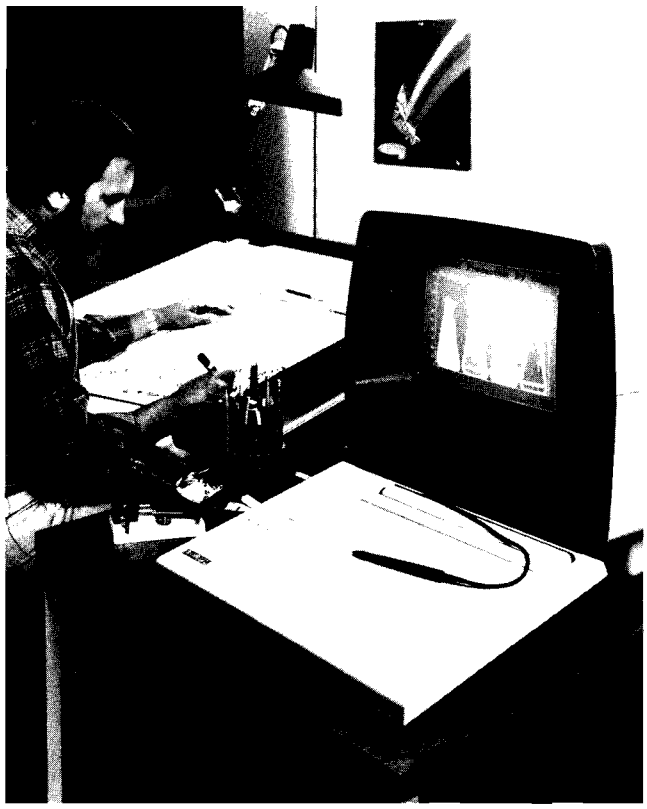
Potential customers for the Model 60 are:

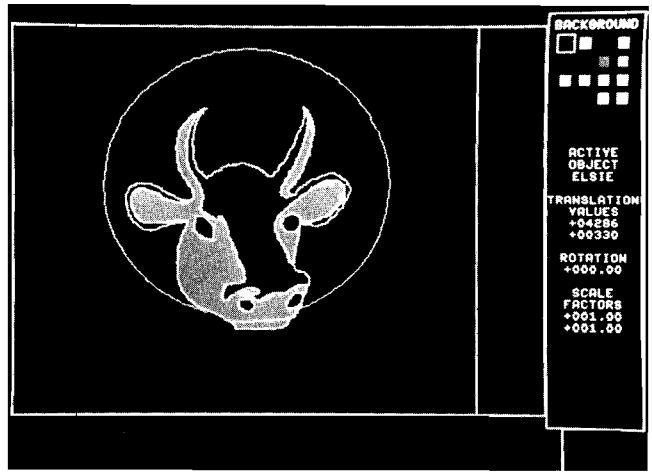
1) Previous HP 2647A customers who are looking for increased speed and flexibility in chart making.

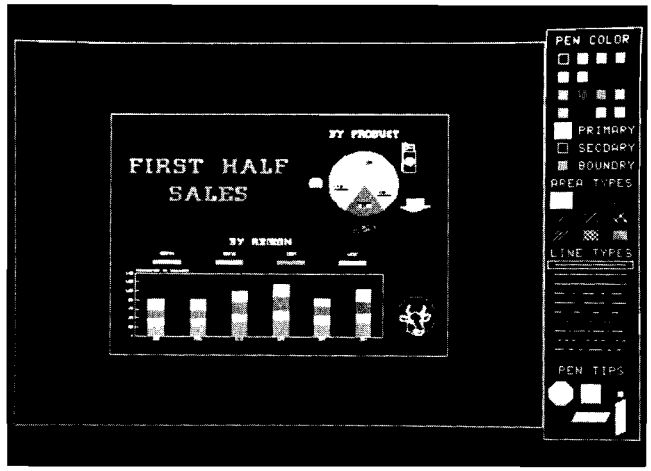
2) Departments, such as marketing, which generate a large number of charts.

3) Large companies with boardroom graphics applications where charts must be quickly displayed.

Where to Sell the Model 65







Model 65 — Presentation Graphics Workstation

The Model 65 is the high-end of the HP2700 series. It provides a comprehensive configuration for those customers which wish to utilize the full capabilities of the HP2700 series in a standalone or on-line environment.

The Model 65's primary application will be as an extended business graphics workstation. The Model 65 provides all the capabilities of the Decision Support Workstation (Model 60) plus the ability to enter drawings via the graphics tablet and PAINTBRUSH/2700. Drawings such as company logo, flow-chart symbols, or simple sketches can be created to produce a first class, high quality business presentation in a short amount of time. The cost of producing a quality presentation is substantially less than one created entirely by hand.

Just as Multiplot of the 2647A pioneered the business graphics marketplace, so is PAINTBRUSH/2700 pioneering the presentation graphics market. It sets new standards at the high end of the business graphics market.

Potential customer's for the Model 65 are:

1) Graphic Artists in major companies for presentation design or consumer product packaging design.
2) Major account managers who use many slides (secretary, clerk or analyst will make actual slides)
3) Companies that give many presentations - add agencies, public relations firms, etc.

A secondary application of the Model 65 will be as a graphics application development tool. Customer's which write applications for the HP2700 may wish to order at least one Model 65 for purposes of picture entry. For instance the Model 65 offers a convenient method for entry of the pumps, tanks and valves of a process control application.

VI. The HP 2700 Competition

The powerful local graphics capability of the HP 2700 will make significant contributions in both the technical graphics and business graphics markets.

In the host driven technical graphics market the strong local graphics capabilities of the HP 2700 will allow it to become an integral part of a technical design system. In some applications the HP 2700 Models 50 and 55 will compete directly with the TEK4113 . The TEK4113 has 640 × 480 screen resolution but its virtual resolution is only 4K × 4K. There are more local functions available at the HP2700 keyboard. In addition HP 2700 graphic features are friendlier to use.

Other competition will come from Chromatics, Megatek, and Ramtek. However, these competitors are really standalone systems and compete most directly with the HP 2700 in combination with a host system. Typicaly they don't have a well defined host software interface and rely on the customer to develop one.

Software is the key to the business graphics market. With customers looking for total solutions the HP 2700 has a prime spot in the competition. Reasonably priced, the HP 2700 models 60 and 65 offer many of the features found on the Execuchart, Dicomed, and Trend Spotter; all costing tens of thousands of dollars more.

Host driven business graphics solutions offered by HP (DSG/3000) which support the HP 2700 will be in competition with third party solutions which support the HP 2700 (ISSCO, SAS, Precision Visuals) on both HP and non-HP systems. In this market the sale of an HP 2700 will depend on the software packages themselves. The extent to which they support the advanced local graphics power of the HP 2700 will determine if the HP 2700 can be cost justified. You can look for increased output, increased user flexibility, reduced system overhead, and enhanced user interface to indicate the value of an HP 2700 on a given software package.

The key in both these markets to selling an HP 2700 against a competitor will be in pricing similar configurations. While prices vary widely for base units, the price of options vary even more. To look at three examples: 1) the base price of a TEK4113 is $16,500 . However the base unit will only display 8 colors. A $1,500 option is necessary to bring it into direct competition with the HP 2700. 2) Flexible mini-discs on the HP 2700 sell for about $2,500; on the Chromatics they cost $3,500. 3) The Chromatics CGC7900 lists for $14,995 but doesn't even include a power supply at that price!

While many competitors have larger higher resolution screens they do so at the cost of display quality. The HP2700's 50/60 Hz noninterlaced display always provides a bright flicker free image.

Against the competition the HP 2700 will stack up well. Even the base unit (Model 50) comes with a full compliment of firmware. The higher end Models 55, 60, and 65 all add hardware and application pacs to enhance particular application areas. All models include the standard VPLUS/3000 compatible alphanumeric features which allow HP terminals to work with existing host applications. In addition, a command channel is provided to allow a user easy interaction with the HP 2700 file system. Many graphics functions can be invoked from the keyboard's graphic keypad; those graphic functions which require parameters from the user prompt the user with simple and clear messages.

Best of all, this local power and complexity can be used by the host and yet remain hidden from the end user. 16 soft keys and friendly error messages make the HP 2700 rise to the top of the pack when customers consider ease of use a major factor in the decision to buy.

The Technical Market Competition

HP 2700 COLOR GRAPHICS TERMINAL COMPETITIVE ANALYSIS

MODEL	HP 2700	TEK 4113	MEGATEK 7250	MEGATEK 6250	RAMTEK 6214	CHROMATICS CGC7900
Price	$18,500–$20,000	$18,000	$36,000	$17,000	$20,000	$20,000
Screen Size (Diagonal)	13″	19″	19″	13″	13″	19″
Resolution Screen Pixels	512 × 390	640 × 480	512 × 480	512 × 480	640 × 480	1024 × 768
Virtual Points	32000 × 32000	4000 × 4000	4000 × 4000	4000 × 4000	32000 × 32000	1000 × 1000
Keyboard Use	Simple and Powerful	Few Keys, Complex	Simple	Simple		Too Many Keys
Zoom and Pan	True Zoom	True Zoom	Limited True Zoom	Limited True Zoom	Graphpro Optional	Hardware
From Keyboard?	Zoom, Pan, Window	Window	Yes	Yes		Yes
Extended Graphic Primitives	Polygonal Area Fill	Polygonal Area Fill	Polygonal Area Fill	Polygonal Area Fill	Graphpro Optional	Polygonal Area Fill
Graphic Commands	Object Manipulations Local PIC	Object Manipulation	Blinking Nested Objects No Rotation	Blinking Nested Objects No Rotation	Graphpro Optional	Circles Blinking
Colors	16/4096	16/4096	16/4096	8/8	8/64	None
Memory	32K Standard 1MEG Optional	16K Standard 640K Optional	64K Standard 192K Optional	64K Standard 128K Optional	16K Standard 32K Optional	256/16MEG
Mass Storage	Optional: Integral Mini-Floppies	NA			Mini-Floppies STD	128K Standard 2MEG Optional
Hardcopy Interfaces	Serial Printer Port STD HP-IB Optional RGB Video Optional	NA	RGB Standard	RGB Standard	RGB Optional Centronix Optional	Optional: Integral Mini-Flo 10 Meg Fixed Disc
Local Software	AUTOPLOT/2700 PAINTBRUSH/2700	Ezgraph			Graphpro Optional Pascal Standard	Programmable
Other	Tablet Optional		3D Hardware Optional Joystick Optional		Tablet Optional Weight = 200lbs.	Line Widths Joystick Optional Lightpen Optional

Product Strengths

The Technical Market Competition

Ways to Win Against the Tek 4113

1. The HP2700 is a compact desk top model.
2. The HP2700 offers a simpler user interface for selecting colors.
3. The HP2700 offers application software to do local presentation graphics.
4. The HP2700 will drive plotters locally.
5. The HP2700 offers two integral mini discs.
6. The HP2700 has a faster internal redraw rate.
7. Customers say the HP2700 has a more vivid display

Strengths of the TEK 4113

1. The Tek 4113 has a 19" diagonal screen and resolution of 640x480.

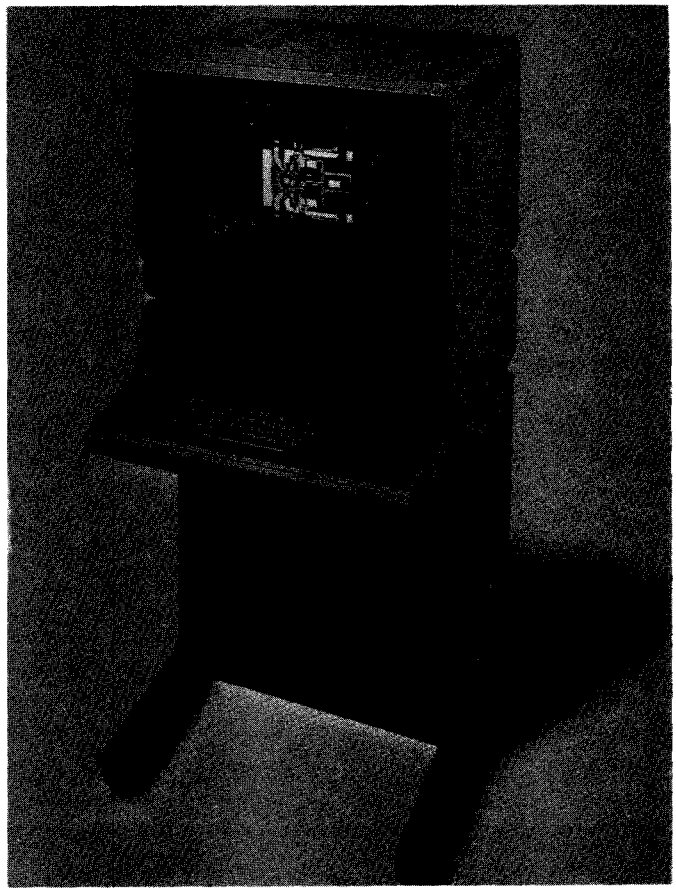
   The HP2700 has a 13" screen and resolution of 512x390, but its virtual plotting space is 32000x32000 points. This is much larger than the Tek's 4000x4000 points and permits the HP2700 to hold much more complex pictures. The smaller plotting space of the Tek 4113 limits the utility of its local zoom and pan.

   The smaller screen size of the HP2700 should only be an objection in applications requiring the screen to be viewed from a distance.

   The lower resolution of the HP2700 will be an objection in those applications which are not willing to accept anything but the smoothest of lines (e.g. mechanical CAD applications).

2. The Tek 4113 is PLOT/10 compatible.

   At this time the HP2700 does not offer a Tek emulation application pac. The HP2700 will be supported by graphics software including: DSG/3000, HPDRAW, HPEASYCHART, Graph 1000-II, plus non-HP software from ISSCO, Precision Visuals and SAS.



Ways to Win Against the Ramtek 6214

1. The HP2700 offers an easy to use true zoom and pan.
2. The HP2700 offers windowing and screen viewports.
3. The HP2700 offers a selection of 4096 displayable colors
4. The HP2700 offers full double buffering of all 16 graphic colors.
5. The HP2700 offers local application software to do presentations graphics.

Strengths of the Ramtek 6214

1. The Ramtek 6214 has a 13" screen and resolution of 640x480.

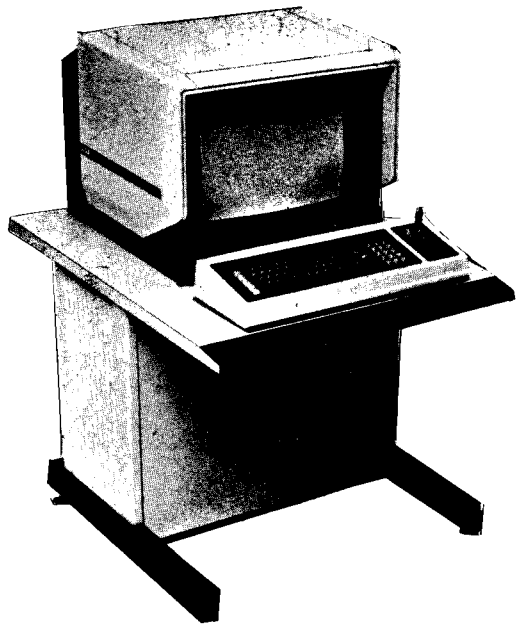
   The Ramtek's higher resolution will make diagonal lines appear much smoother on the screen.

2. The Ramtek 6214 offers PASCAL programability.

   The HP2700 does not offer any local programability at this time. However, the HP2700 does offer local application pacs and sophisticated local graphic manipulations. These features may prove useful enough to a host system that programmability is not really required in the terminal.

The Technical Market Competition

Ways to Win Against the Megatek 7250



1. The HP2700 costs $15,000 less than a similarly configured Megatek.
2. The HP2700 offers a greater local zoom and pan capability.
3. The HP2700 can display more colors from a greater range of colors.
4. The HP2700 offers a simple interface for selecting colors .

Strengths of the Megatek 7250

1. The Megatek 7250 has a 19" diagonal screen and a resolution of 512x480.

   The HP2700 has a 13" screen and resolution of 512x390. The Megatek 7250 has an address space of 4000x4000 and a 19" screen with a resolution of 512x480. The small address space limits the power of their true zoom and pan.

2. The Megatek 7250 offers a joystick.

   Joysticks are typically needed when a user wishes to exert diagonal control of a cursor. The HP2700 offers a tablet as a solution for those applications. In addition, the HP2700 makes it easy to move the cursor in only the X or Y direction. It is often hard to move only horizontally or vertically with a joystick.

3. The Megatek 7250 offers optional 3D graphic manipulation.

   3D manipulation is a plus for the Megatek 7250. However, it's not only a feature plus, but also a price plus on a more expensive unit.

Ways to Win Against the Chromatics CGC7900

1. The HP2700 has the ability to manipulate graphic objects locally.
2. The HP2700 has a virtual plotting space of 32,000 by 32,000 points.
3. The HP2700 has true software zoom and pan.
4. The HP2700 has local application software to do presentation graphics.
5. The HP2700 is a desk-top unit

Strengths of the Chromatics CGC7900

1. The CGC7900 has a 19" screen and 1024x768 resolution.

   The HP 2700 has a 13" screen and 512x390 resolution. Their display is 30Hz with high persistence phosphor to avoid flicker. Result: ghosts remain on the screen after vector is erased for a noticeable time length.

The Business Market Competition

Ways to Win Against the ISC-based Trend-Spotter System

1. The HP2700 can drive local plotters.
2. The HP2700 costs $25,000 less.
3. The HP2700 offers a freehand drawing application.

Strengths of the Trend-Spotter

1. The Trend-Spotter has a greater selection of charts.

   Autoplot/2700 offers the most common chart types. Trend-Spotter does more, but it costs more.

2. Trend-Spotter provides facilities for local data analysis.

   "Local" is the key word here. AUTOPLOT/2700 runs in a terminal which means it can be supported by host application programs. AUTOPLOT/2700 can accept data from a host system and a user can use host facilities for data manipulation.

Ways to Win Against the Execuchart System

1. The HP2700 offers a freehand drawing application.
2. The HP2700 is also a system terminal.
3. The HP2700 cost $20,000 less.
4. The HP2700 provides more colors from a larger selection.

Strengths of the Execuchart

1. The Execuchart system is known for its excellent user documentation.

   Both AUTOPLOT/2700 and PAINTBRUSH/2700 provide superb user documentation.

Ways to Win Against the Dicomed D-38 System

1. The HP2700 offers automatic charting of data.
2. The HP2700 can drive a local plotter.
3. The HP2700 costs $40,000 less.
4. The HP2700 is also a system terminal.
5. The HP2700 redraws charts and pictures much faster

Strengths of the Dicomed D-38

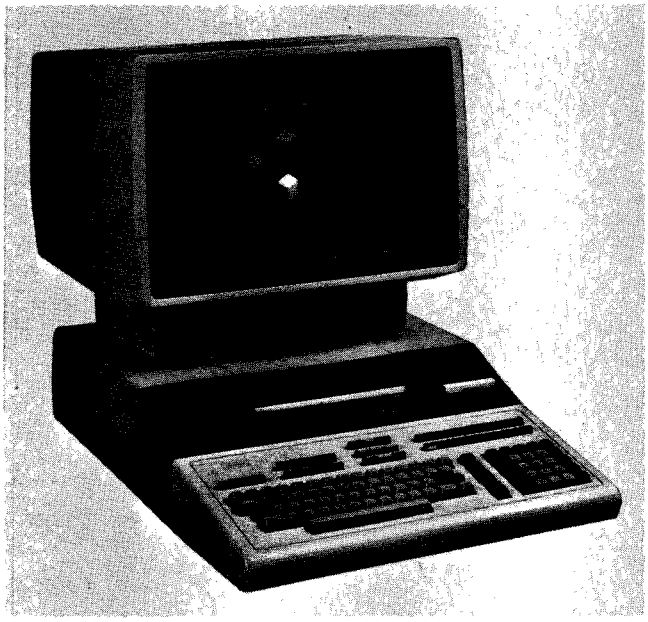
1. The D-38 provides an interface to high resolution Dicomed cameras often found in service bureaus.

   The HP2700 does not offer an application pac to interface to the D-38 camera. The HP2700 does offer a plotter interface as well as a video interface to compatible cameras.

The Business Market Competition

MODEL	**HP 2700 Model 65**	**Trend-Spotter**	**Exec-u-Chart**	**Dicomed D-38**
PRICE	$25,000–$27,000	$50,000	$45,000	$60,000
CHART TYPES	Line, bar, pie, text, scattergrams, log, combined charts freehand drawings	Line, bar, pie, text, gantt, maps, org. scattergrams	Line, bar, pie, text	Freehand with char assistance
USER INTERFACE	Tablet, menus	Tablet	Tablet, mouse	Tablet
COLOR HARDCOPY	RGB to camera or monitor HP-IB to plotters, printers RS232C to plotters, printers	Camera Xerox 6500	Printer Camera	Camera
BASIC HARDWARE	HP 2700	Chromatics CGC7900	Z80 Based 8 color	TEK 4027
MASS STORAGE	2 integral mini-floppies	2 integral mini-floppies		2 flexible mini-discs
OTHER	Can plot data sent from host (e.g., INFORM/3000) also allow for local editing of host generated graphics	File security data analysis		

The HP 2700 and the HP 9845C



The HP 9845C and the HP 2700 seem at first look to have very similar feature sets: medium resolution color graphics on a 13" screen. However that is the end of the similarities.

The HP 9845C is a desk top computer. It is programmable in several languages, it provides for intelligent control of many HP-IB peripherals; it provides a great deal of local computing power.

The HP 2700 is a computer terminal. The HP 2700 does provide application software which run in the terminal to give your customer some local standalone capabilities. However, the HP 2700 is NOT programmable.

In its role as a terminal the HP 2700 provides many high level graphic commands which are friendly and easy to use. One of the big advantages the HP 2700 offers host application programmers is picture file management.

The HP 2700 is able to store many segments of a big picture and manipulate these segments (objects) under host direction. For instance the HP 2700 is able to rotate segments with a simple command. Operations which may call for a large matrix manipulation by the HP 9845C programmer can be accomplished within the HP 2700 with one short escape sequence. This picture file management also allows the programmer to add, move, and delete segments of a picture easily. When the picture file in the terminal has been updated the host can command the HP 2700 to redraw the picture and the HP 2700 will automatically update the screen!

In addition, a host program can allow the user to manipulate the picture on the screen without host interaction. From the keyboard a user is able to zoom, pan, and window; all without any host programming effort! The end analysis rests on your customers need in computing power. If your customer has a need for an intelligent workstation then the HP9845C will be the right choice. If your customer is looking for a standalone business graphics or design graphics workstation then the HP 2700 will be a good choice. If your customer is interested in host driven graphic packages and applications, then once more the HP 2700 will shine.

VII. Common Questions

1). **Is the HP 2700 compatible with the HP 2648A, 2647A, and 2623A?**

Yes. The HP 2700 is a superset of these products. A primary design goal of DTD is always compatibility. We have tested the HP 2700 on dozens of applications programs which were written for our other products and they all ran without modification.

2). **What about color hard copy?**

The HP 2700 offers 3 basic types of color hard copy.

1). Plotter Output — The HP 2700 can drive RS-232 and HP-IB plotters that take HP-GL input.
2). Camera Output — Via the RGB video interface to a Dunn or Matrix camera on 35mm slides, polaroids, 8 × 10 glossies, and transparencies.
3). Color Printers — We will offer drivers for selected non-HP color raster printers using the standard 2nd RS-232 port.

The HP 2700 also offers a halftoning mode. Halftone simulates colors on a B&W Raster Graphics Printer by mapping colors to shaded patterns. This feature is especially useful for B&W xeroxing of charts.

3). **Does it come with a larger screen?**

Some applications, primarily in the technical market, may desire a larger screen. If this is the case, ask why a larger screen is needed.

If it is needed to be clearly seen from a distance, point out the vividness our 60 Hz non-interlaced display and offer the possibility of connecting large (19" or greater) monitors external to the HP 2700 via its RGB video I/F.

If viewing of more detail on the screen is what is desired (screen resolution greater than 512 × 390) discuss the advantages of the 32K by 32K addressable resolution with true zoom and pan as a solution.

4). **How do I get data from my data base to AUTOPLOT/2700 without keying it in?**

AUTOPLOT/2700 can accept data from the host in tabular form. Particularly useful for the HP 3000 owners is the use of Inform/3000 to pull the desired numbers from the data base and pass them to AUTOPLOT/2700's data menu.

5). **Why did you choose thumbwheels over other input devices such as a joystick, light pen, or mouse?**

The selection of a graphics input device is somewhat subjective but after a lot of thinking the thumbwheels were selected because of their high reliability and positive control of X,Y cursor positioning.

Joysticks are not as reliable and somewhat awkward. It can also be somewhat difficult to select the individual pixels (dots on the screen) as required in some applications.

A mouse requires extra table space. Light pens were not selected due to the fatigue that can result in holding an arm up to the display and the difficulty in seeing past the hand.

For applications which are heavily user/screen interactive, the optional graphics tablet is available.

6). **How many vectors can the terminal store?**

As a rough guideline the following rules can be used to calculate the number of vectors the HP 2700 can store:

1). Each object uses about 40 bytes of overhead (i.e., to give it a name, location, etc.).
2). Each end point in the vector list requires 4 bytes to define its location.

The vector memory is expandable from the standard 32K bytes to 992K bytes.

Therefore, the number of vectors it can store is dependent on the number of objects and the amount of vector memory. An application which requires 100 objects with 200 vectors each would consume only about 4800 bytes.

The HP 2700's vector storage capability will rarely be a limitation.

7). **What is the terminal's vector drawing speed?**

The internal redraw rate from the vector list is dependent upon the number of objects. With few objects, the redraw rate is about 3000 vectors/sec. The overhead associated with multiple objects can slow the internal redraw rate.

8). **Isn't it awfully big for a terminal?**

In relation to its graphics processing power and the size of competitive devices it's actually rather small. Its small desktop size is one of its competitive advantages.

VIII. Configuring the HP 2700 with Systems

Data Communications

- RS232 — or RS422 Data Comm
- Character Line Or Block Mode Operation
- Full Duplex (only)
- Point-to-Point Data Comm (no multipoint)
- Data Comm Pod Support
  - — Current Loop
  - — 300 Baud Modem
- Terminal Configuration Menus
- Soft-Configuration Stored in Non-Volatile RAM

Port 1 Supports:

Hardwired or Remote to Systems
RS232
RS422
Current Loop Pod
Bell 103J, 212A, 202T 35016 A modems

Port 2 Supports:

RS232 Printers
RS232 Plotters

All of the HP 2700 Models and configurations have the same data communications capabilities as the 2622A and 2623A terminals.

Interfacing to Systems

HP Systems

For ease of configuration, the cabling and terminal configuration menu settings are essentially identical to how a 262X terminal would be configured on Port 1.

The HP2700 Datacomm Boards Port 1 & Port 2 connectors are different from our other products. Therefore, every HP2700 terminal comes standard with 2 cables that convert the connections needed from the HP2700 connectors to the standard 50 pin & 25 pin connectors found on Port 1 and Port 2 respectively of the 262X products. The cables used on the HP2700 are the sames as those used on 262X products.

Logically, the HP2700 will run on all of the business and technical computers. However, due to the various regulations regarding radio frequency emissions, the HP2700 can only be sold on approved systems.

At the time of the printing the list of approved systems for the HP2700 was not available. The goal is for HP2700 to meet regulations on all systems that meet the regulations. Indication are this should not be a problem. Consult the Computer News for more current information.

For more detailed configuration information refer to the 2622A or 2623A Field Training Manuals configuration section.

To Non-HP Systems

Due to the advanced nature of the HP2700 most of our system competitors do not have products that come even close to the capabilities of the HP2700. Therefore, we expect a large number of HP2700 sales onto non-HP systems.

A great deal of effort has been put into making the HP2700 Data Comm, as flexible as possible. As a result, we should be able to communicate effectively with any RS232 ASCII Port.

For more detailed information on communication of HP terminals with non-HP systems, refer to the DTD Interfacing Guide.

Software Support

The HP2700 has been tested with dozens of application programs and no serious differences between our other products have been found. The HP2700 should run well with existing software.

HP Software Support

- VPLUS/3000 Compatible (2 color support)
- DSG/3000 Compatible (multiple color support)
- Graph 1000-II Compatible (supported as a color 2623)
- HPDRAW
- HPEASYCHART

Non-HP Software Support

Support of Orion's advanced features should be available shortly after introduction from the following software vendors. Consult the computer news for details on extent and date of support.

Issco	Precision Visuals Inc.	SAS Institute
DISSPLA	DI-3000	SAS/
Tell-A-Graf	GRAF MAKER	GRAPH

IX. Configuring the HP 2700 with Peripherals

COMPATIBLE HP PERIPHERALS

DEVICE	DESCRIPTION	INTERFACE HP-IB	INTERFACE RS-232	RS-232 CABLE
PRINTERS				
2673A	Intelligent Graphics Printer	X	X	13242G
2671G	Thermal Graphics Printer	X	X	13242G
9876A	Thermal Graphics Printer	X	X	13242G
2631G	Impact Graphics Printer	X	X	13242G
2601A	Letter Quality Printer		X	13242G
PLOTTERS				
7220C	RS-232 8 Pen Plotter		X	13242G
7220T	Paper Advance Version		X	13242G
7470A	2 Pen Plotter	X	X	13242G
9872C	HP-IB 8 Pen Plotter	X	—	
9872T	Paper Advance Version	X	—	
7580A	D-Size Plotter	X	X	13242G
MASS STORAGE				
9895A	Dual 8" Mini-Floppies (2 Mbytes)	X		
7906H	20 Mbyte Disc Drive	X		

COMPATIBLE NON-HP PERIPHERALS

In addition to the color output provided by HP plotters, the HP 2700 can drive some non-HP color printers, cameras, and monitors.

COLOR PRINTERS

Drivers for the following non-HP color raster printers are included in the standard HP 2700. They interface to the HP 2700's second RS-232 port.

COMPANY	MODEL	CABLE
PrintaColor P.O. Box 52 Norcross, Georgia 30091 (404) 448-2675	GP1024	13242G
Ramtek 2211 Lawson Lane Santa Clara, CA 95050	4100	13242N

CAMERAS

Camera output will frequently be desired by users of the Model 65 Presentation Graphics Workstation. Cameras interface to the HP 2700 via the optional RGB Video Interface.

COMPANY	MODEL
Matrix Instruments 230 Pegasus Ave. Northvale, NJ 07647 (201) 767-1750	2000/3000
Dunn Instruments P.O. Box 77172 544 2nd Street San Francisco, CA 94107 (415) 957-1600	

MONITORS

50/60 Hz interlaced color monitors interface to the HP 2700 via the RGB Video Interface option. Compatible monitors are available from the following:

CONRAC 600 North Rimsdale Ave. Covina, CA 91722 (213) 966-3511	7211
BARCO 5128 Calle de Sol Santa Clara, CA 95050 (408) 727-1506	CDCT 3/51

X. Ordering Information

The HP 2700 family of terminals is ordered via HEART as an HP 2703A. To order a particular model the following option numbers are used.

HP 2703A MODELS

Model 50 — High Performance Color Graphics Terminal

Model 55 — Technical Design Terminal

- Option 555 Includes
  - — Vector Memory (224K bytes)
  - — Double Buffered Graphics
  - — Graphics Tablet

Model 60 — Decision Support Workstation

- Option 560 Includes
  - — Flexible Mini Discs
  - — Program Memory (128K bytes)
  - — AUTOPLOT/2700

Model 65 — Presentation Graphics Workstation

- Option 565 Includes
  - — Flexible Mini Discs
  - — Program Memory (128K bytes)
  - — Vector Memory (224K bytes)
  - — Double Buffered Graphics Memory
  - — AUTOPLOT/2700
  - — PAINTBRUSH/2700
  - — Graphics Tablet

Ordering Information

HP 2703A	Options
001	Finnish/Swedish Keyboard
002	Norwegian/Danish Keyboard
003	French Keyboard
004	German Keyboard
005	UK Keyboard
006	Spanish Keyboard
013	240 VAC, 50 Hz
014	100 VAC, 60 Hz
015	220 VAC, 50 Hz
016	100 VAC, 50 Hz
054	RGB Video Interface
072	Flexible Mini Discs
096	Shared Peripheral Interface
164	Program Memory (+128K bytes)
165	Program Memory (+256K bytes)
174	Vector Memory (+64K bytes)
175	Vector Memory (+192K bytes)
176	Vector Memory (+448K bytes)
177	Vector Memory (+960K bytes)
186	Double Buffered Graphics Memory
301	13222N, U.S. Modem Cable, male
302	13222M, European Modem Cable, male
303	13222C, RS-232-C Cable, female
304	13222X, HP-Direct Connect RS-232 Cable
305	13222Y, RS-232-C EMP Protect Cable, male
306	13222P, RS-422 Cable, male
555	Model 55, Technical Design Terminal
560	Model 60, Decision Support Workstation
565	Model 65, Presentation Graphics Workstation

Ordering Information

HP 2703A Accessories

13273A	Software	AUTOPLOT/2700 (requires mini discs and 128K program memory)
13273C		PAINTBRUSH/2700 (requires mini discs and 128K program memory)
13273H	Interfaces	Shared Peripheral Interface
13273M		RGB Video Interface
–001		(required if double buffered graphics — 13273G is installed)
13273P	Memory	Program Memory (+128K bytes)
–001		+256K bytes
–002		
13273G		Double Buffered Graphics Memory
–001		(required if RGB Video I/F 13273M is installed)
13273V		Vector Memory (+128K bytes)
–001		+256K bytes
13273T	Tablet	Graphics Tablet

Ordering Information — HP 2703A Cables

HP 2703A Cables

System communications is only supported on Port 1.
The second port is for RS232 printers or plotters.

PORT 1 CABLES

13222C	RS232C Cable	Female	2 Meters
13222M	European Modem Cable	Male	5 Meters
13222N	RS232C US Modem Cable	Male	5 Meters
13222Y	RS232C 3 Wire Cable	Male	5 Meters
13222X	Direct Connect Type 232		5 Meters
13222P	Direct Connect Type 422		5 Meters

PORT 2 CABLES

13242G	RS232 Printer Cable	Male	5 Meters
13242H	RS232 Printer Cable	Female	5 Meters

DATA COMM INTERFACES

13265A	300 Baud Modem
13266A	Current Loop Interface

HEWLETT
PACKARD

Printed in U.S.A. 7/82
5957-3430