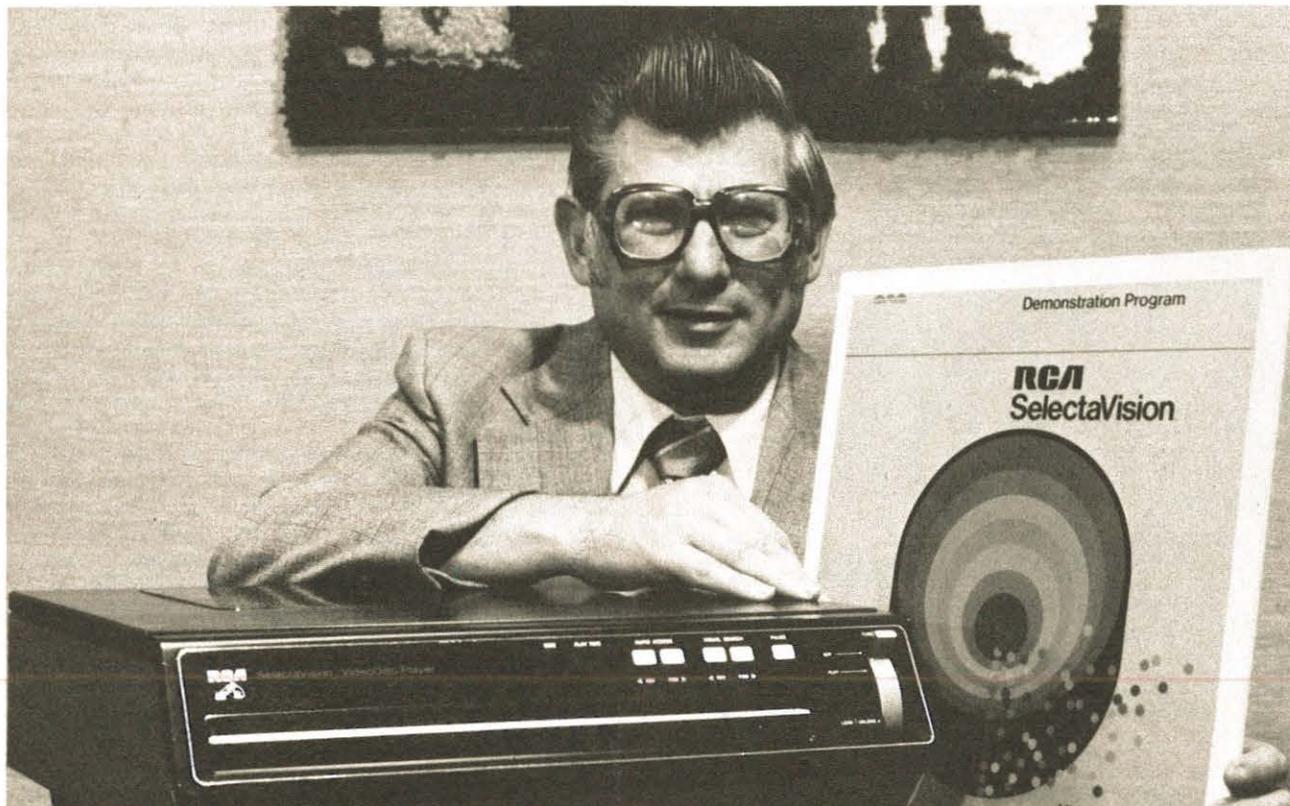


Information Display

The Official Journal of the Society For Information Display

FEBRUARY, 1982



Shown here is Dr. Jay J. Brandinger, a SID member who is vice president, RCA SelectaVision Video Disc Division, Indianapolis. He has supplied the following summary of the article appearing on pages 3 to 5.

The development of a video disc system is a natural outgrowth of the historical desire to record sight and sound information. Combining the concepts of audio disc recording and color pictures, video discs achieve an equivalent information storage of more than 200 billion (200×10^9) bits representing two hours of color television programming — truly a remarkable achievement when it is realized that the cost is less than 10 milli-microcents per bit.

The RCA "CED" VideoDisc system is a capacitance electronic disc system which uses a stylus to pick up video and audio information stored in the grooves of a rotating plastic disc. To achieve high information storage

densities, information elements as small as 0.5 micrometer along the grooves and groove density of 3793 grooves per centimeter are used. The development of a compatible disc-stylus arrangement has been the main focus of research and development for the past 15 years. The cost-effective manufacturing of quality discs and stylus cartridge assemblies is fundamental to achieving a viable consumer product. Similarly, the availability in quantity of many software titles is necessary to satisfy a broad range of people with different demographic, geographic, sex, and age differences.

The discussion on pages 3 to 6 reviews the marketing results and expansion plans since the March 22, 1981 introduction of RCA's CED VideoDisc system to the American market as well as a description of disc fabrication and player operation.

FRONT COVER MATERIAL WELCOMED: Every month **Information Display** usually features one or more active members of SID and the products with which they are most closely associated. Please send a glossy print and appropriate captions so that you, too, can be on our front cover. Send your material to Ted Lucas, Editor, P.O. Box 852, Cedar Glen, CA 92321, or to our National Office Manager, June Friend, for Information Display, 654 North Sepulveda Blvd., Los Angeles, CA 90049. Next deadline for material from you is March 10 for the April issue. If you miss that, try for the May issue. **NOTE:** We also welcome feature articles on interesting projects.

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Six Million Video Discs in 1982

by Dr. Jay J. Brandinger
Vice President
RCA SelectaVision VideoDisc
Indianapolis, IN

The CED VideoDisc system was introduced to the American market through more than 5,000 dealers. The players carried a suggested list price of \$499.95. Discs, from a selection of 100 titles, were available at an average price of about \$20. Within the first five weeks, an estimated 26,000 players and 200,000 discs were sold to consumers, making this the most successful introduction of any major electronics product in history. Color and black-and-white television receivers sold less than 10,000 units in their initial year of introduction. This initial success has been reinforced during the first five months since introduction with 135,000 players and 1.4 million discs produced and sold.

The disc manufacturing plant in Indianapolis has been expanded. Its expansion will continue so that an estimated total of more than 6 million discs will be produced in 1982. The expansion program includes the building of a separate compounding facility with capacity sufficient to supply critical compound material to disc manufacturers worldwide. A new power plant is also under construction with an energy capacity to support 60 presses.

The CED program catalog has approached 200 titles by the end of 1981 and will reach 400 by the end of 1982. Top selling albums include: M*A*S*H, The Muffet Movie, Black Stallion, 20,000 Leagues Under the Sea, Star Trek — the Motion Picture, Casablanca, The Godfather, Grease, and Fiddler on the Roof. The titles chosen for RCA's catalog have appeal to the widest possible audience — young and old — male or female.

With regard to consumer acceptance of the system, more than 96% of the VideoDisc owners responding to a consumer survey have indicated that the player has equaled or exceeded their expectations. The average number of albums owned at the time of the survey was 18. This acquisition rate exceeds all pre-launch expectations.

The following is a brief description of the introductory CED 525 line/60 Hz system.

Disc

Information signal patterns are first cut in copper and then replicated in several electroforming operations to

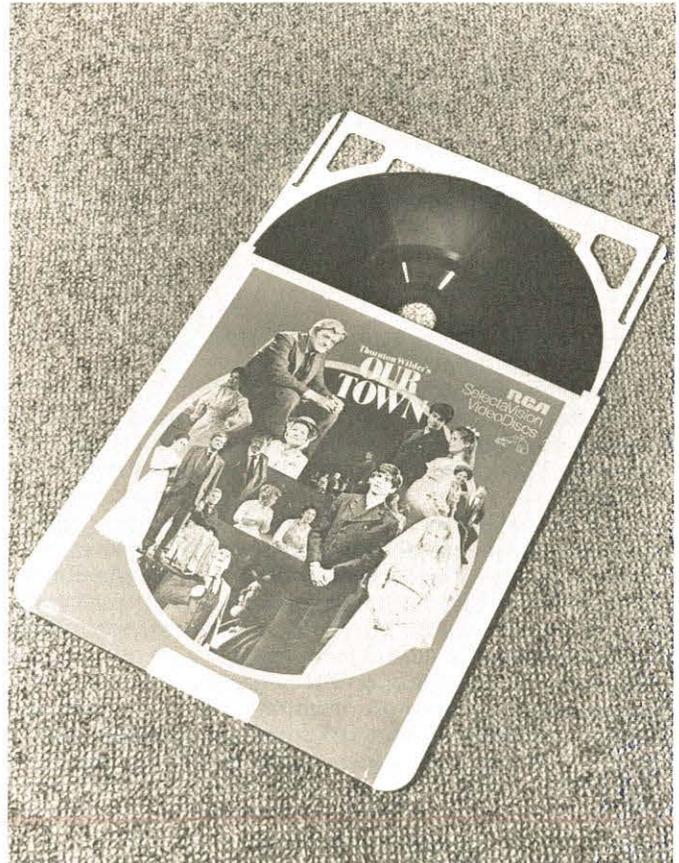


Figure 2. Caddy with Disc and Spine Exposed.

produce stampers. These stampers are mounted in multiton compression molding presses on which are molded conductive carbon loaded polyvinyl chloride discs. The various steps in master recording and producing a finished disc are illustrated in Figure 1.

The basic materials used in the compound have purities similar to those used in pharmaceuticals, i.e., impurities less than 50 parts per billion. A closed

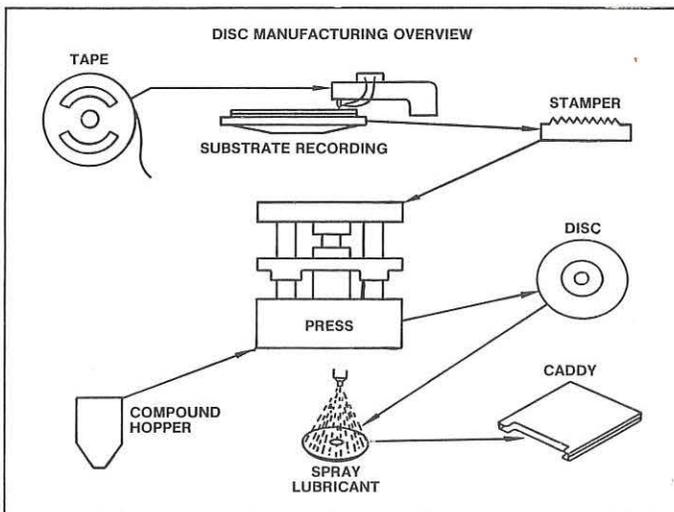


Figure 1. Disc Manufacturing Overview.

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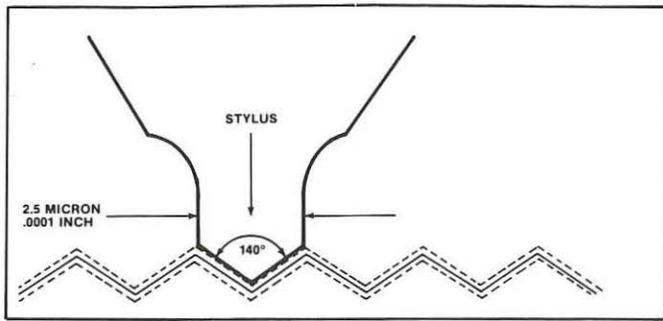


Figure 3. Disc and Stylus Cross Section.

process system operating in a clean environment minimizes disc defects.

A caddy is used to protect the disc from exposure to typical home environments and provides the added advantages of space for a label, convenient storage and shipment. This unique commercial product is shown in Figure 2.

The disc never leaves its caddy except during play, when it is automatically extracted by the player mechanism. After play, the caddy is reinserted into the player and the disc is automatically inserted into the caddy through a dust seal at the caddy mouth entrance. This seal removes gross debris from the disc.

The basic information on the VideoDisc is embossed as frequency modulated undulations in a 140° V-shaped spiral groove about 19 kilometers long, representing 1 hour of play time on each side of the disc. A cross section of the disc and stylus is shown in Figure 3.

A diamond stylus whose length spans several of the longest signal element wavelengths (4 micrometers) under a 65 milligram force, rides smoothly in the groove along the crests of the recorded waves as shown on the diagram in Figure 4.

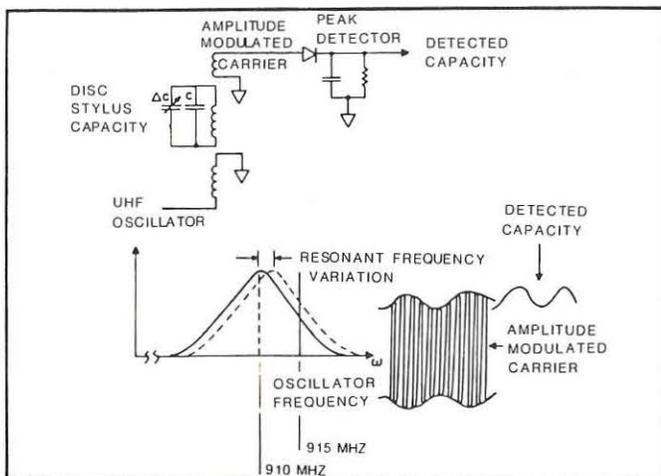


Figure 4. Close-up of Stylus Pickup.

The surface of the disc rises and falls under the metalized end of the stylus as the turntable rotates at 450 revolutions per minute, causing variations in electrical capacitance between the electrode and the conductive disc surface. The complex audio/video FM waves pressed into the disc have a peak-to-peak amplitude of about 850 angstroms producing a corresponding capacitance change in the order of 1×10^{-16} farads. The stylus/disc capacitance is part of a 910 MHz resonant circuit shown in Figure 5.

Changes in resonant frequency amplitude modulate a 915 MHz uhf oscillator signal which is peak diode detected to extract a frequency modulated signal that

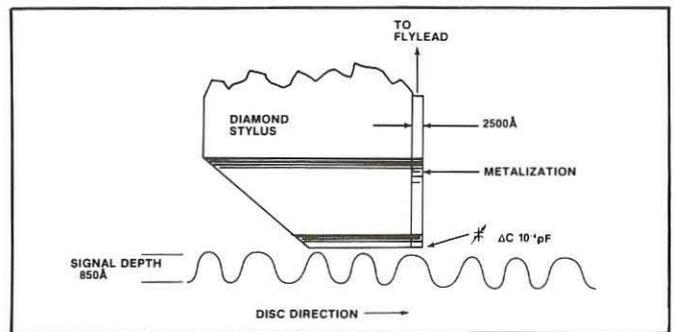


Figure 5. Signal Pickup.

corresponds to the signal recorded on the disc. The limited bandwidth on the disc required compacting the color television signal within a 3 MHz bandwidth. The color signal is imbedded in the luminance band on a 1.53 MHz subcarrier whose frequency spectral components are centered at odd multiples of one-half the horizontal line frequency (nulls in the luminance of one-half the horizontal line frequency band). The composite "buried subcarrier signal" has a frequency spectral distribution as shown on the diagram in Figure 6.

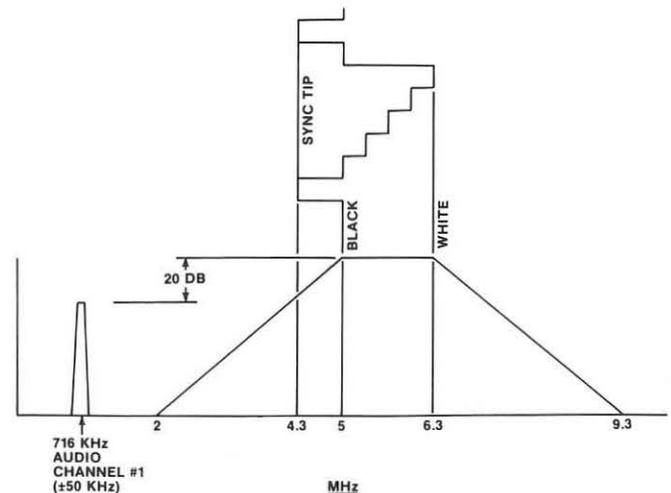


Figure 6. Frequency Spectrum.

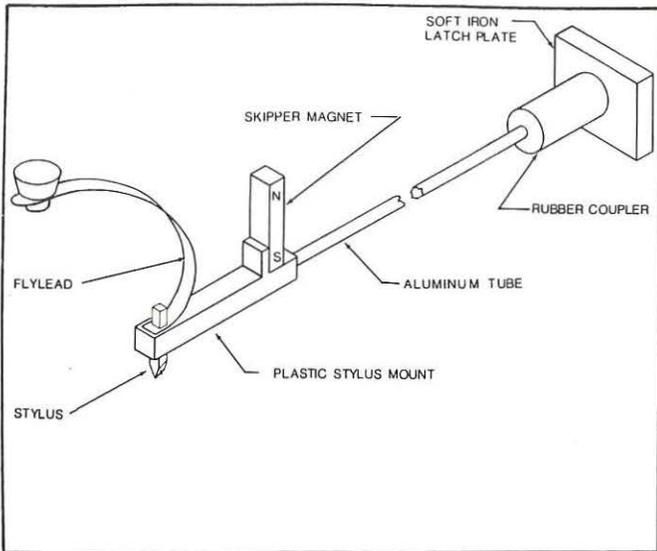


Figure 7. Stylus Arm.

A flexible rubber-mounted support provides the compliance required to allow the stylus to follow irregularities in the disc. A small permanent magnet mounted on the stylus arm is activated by magnetic pulses to provide limited two-groove lateral stylus motion. The stylus is connected to the uhf circuitry by a flexible flylead. The stylus arm, flylead, and compliant support are mounted in a replaceable cartridge shown in Figure 8.

The cartridge is mounted in the arm of the turntable and driven radially by a dc motor across the disc from outside to inside.

The main parts of the player electronics are shown in Figure 10, a simplified block diagram.

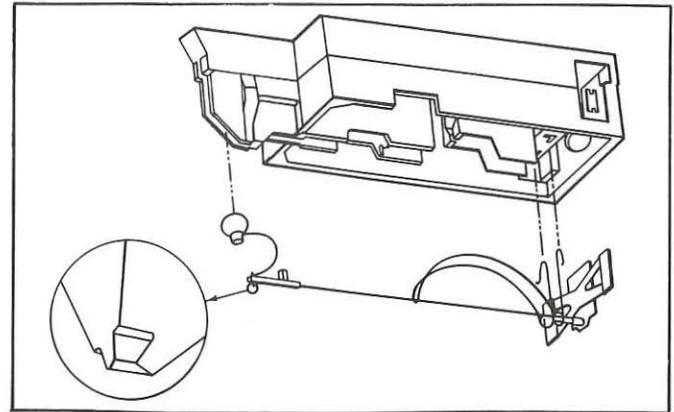


Figure 8. Stylus Cartridge.

The 915 MHz modulated oscillator signal on the left side of the diagram is peak detected to reproduce the frequency modulated signal from the disc surface. One H-delay comb filtering separates the luminance and chrominance components. Luminance and chrominance remodulated to a 3.58 MHz subcarrier are combined with the audio 4.5 MHz frequency modulated signal to create a composite NTSC video signal suitable for translation to vhf channels 3 or 4. These signals are available from the back of the VideoDisc player and connect directly to the TV set's antenna terminals. Various signal correction circuits are provided to compensate for disc defects, time-base variations, and mistracking.

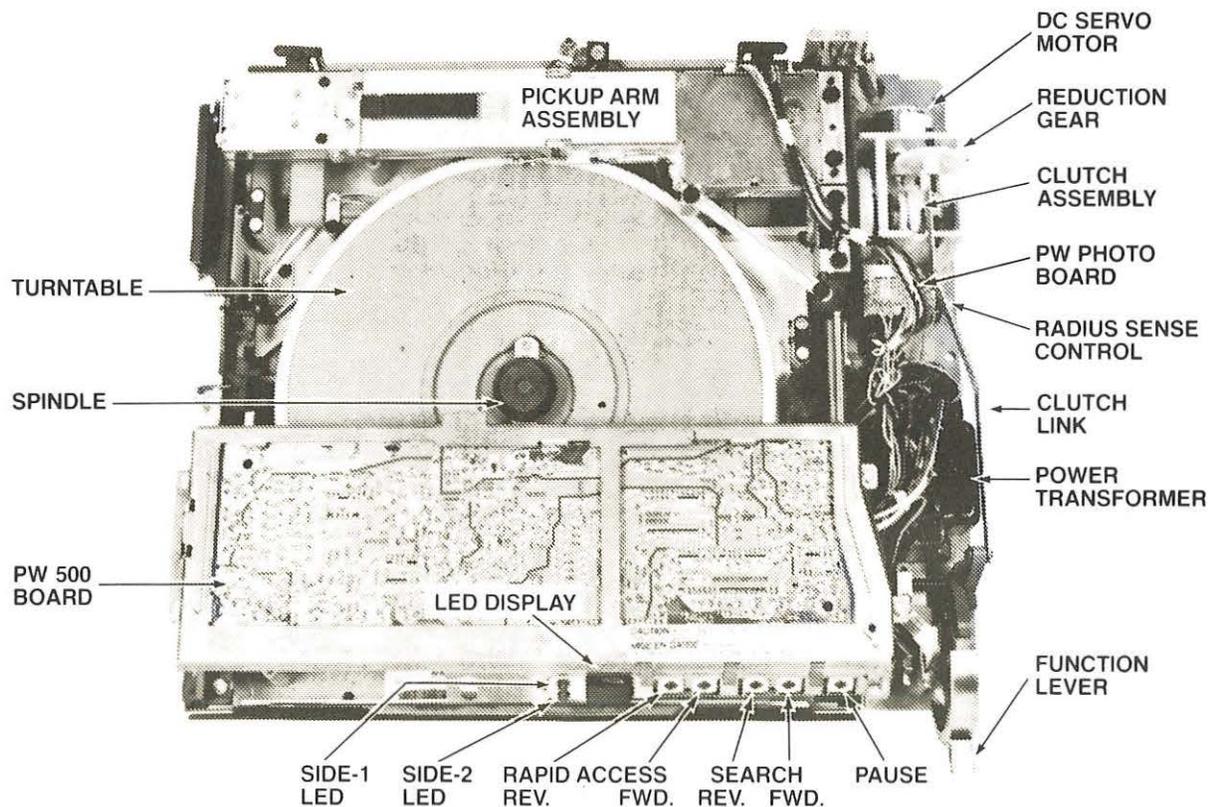


Figure 9. Top View of VideoDisc Player with Case Removed.

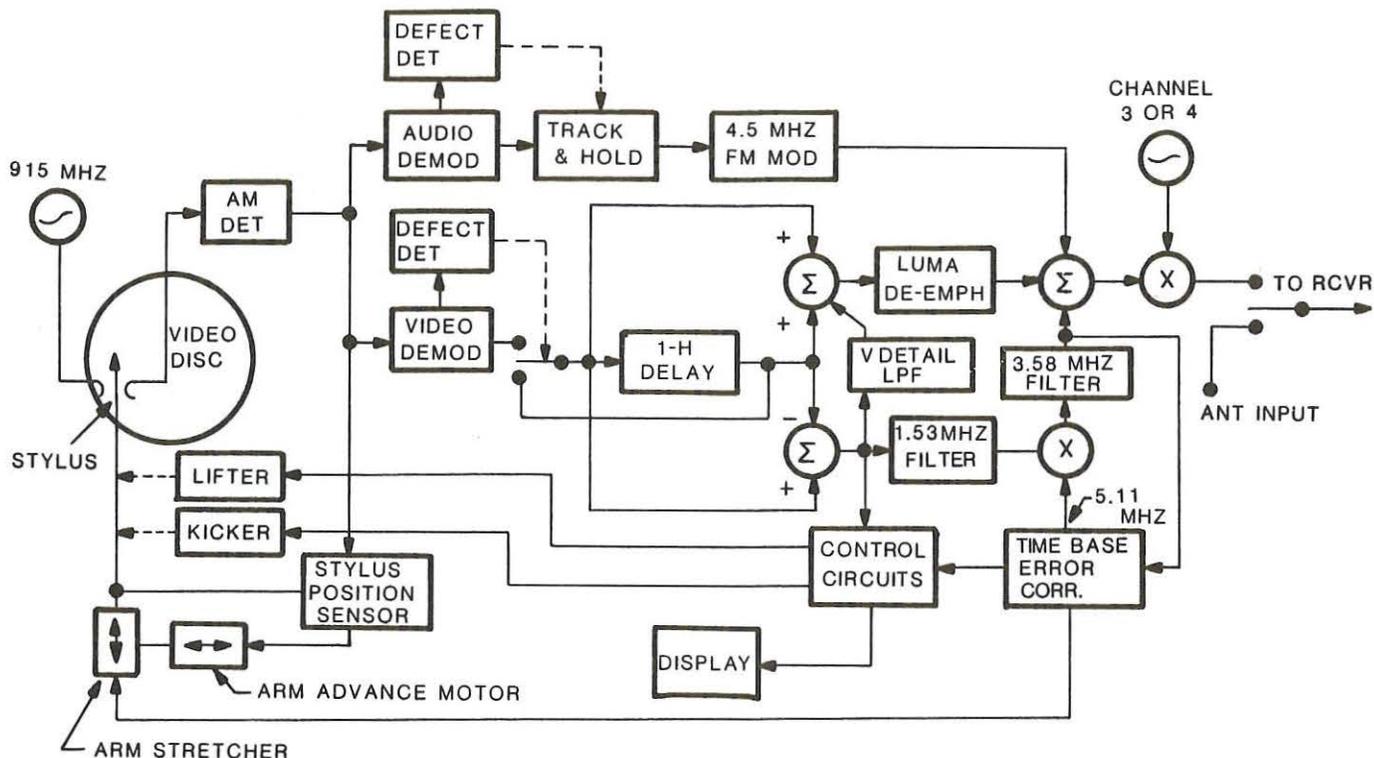


Figure 10. Player Block Diagram.

The introductory NTSC player features include: PAUSE; VISUAL SEARCH, at 16 times normal rate without picture breakup; RAPID ACCESS, at 150 times normal speed, with muted video and audio. A two-digit LED play-time indicator shows minutes of play starting from the beginning of the disc. A photograph of the player and the player specifications are shown in Figure 11.

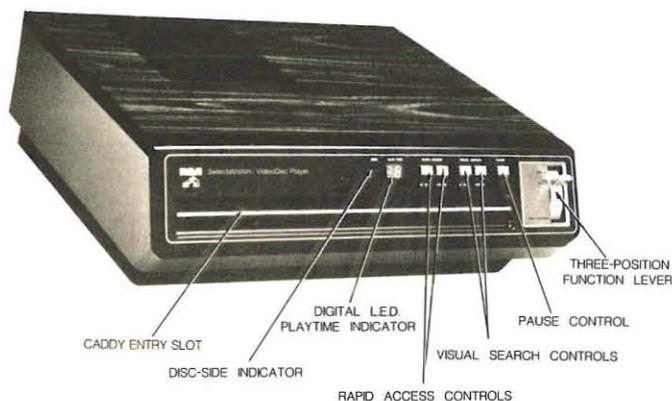


Figure 11. VideoDisc Player—Model SFT100.

VideoDisc Introductory Player - Model SFT100 Specifications

Playing Time : 2 hours (1 hour/side)	Signal Sensing Technique: Capacitance
Player Weight : 9.1 kg	Disc Material: Conductive PVC
Power Input : 35 Watts	Disc Handling: Caddy
Size : 43.2 cm x 39.6 cm x 14.7 cm	Disc Diameter: 30.2 cm
Stylus Material: Diamond	Revolutions per side: 27,000 (one hour)

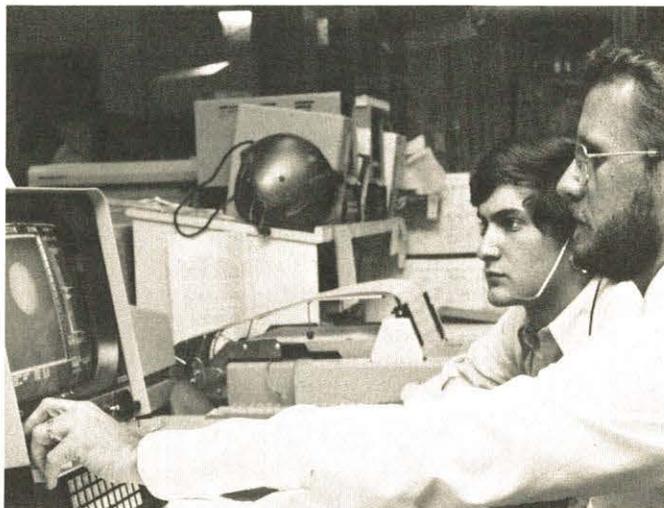
Appendix

CED VideoDisc Chronology

- 1953 RCA Laboratories concluded that plastic discs could be pressed with signal elements less than $1\mu\text{m}$. Recording and signal recovery technology for such small signal elements did not exist.
- 1960 Capacitance readout of high density information from a thin conducting film on a disc was theoretically predicted.
- 1964 RCA Laboratories formalized a team to invent a consumer videodisc player system.
- 1970 First recognizable picture playback from a disc.
- 1971 Electron beam master recording (EBR) was developed. Grooved discs, 12 inches in diameter compression-injection molded, were coated with a thin conductor and protective insulator. These discs were played with a sapphire capacitance stylus.
- 1973 The first player model—20 minutes per side (1600 grooves per cm) 900 MHz stylus-arm electronics.
- 1975 Second player model—30 minutes per side (2200 grooves per cm).
- 1976 Caddy chosen to protect disc surface from contamination.
- 1977 Conductive discs demonstrated with performance comparable to coated discs.
- 1978 Player developed to accept a caddied disc, 1 hour per side playing time (3800 grooves per cm), diamond stylus. Software library development started.
- 1979 RCA announced its commitment to bring the CED system to market.
- 1981 March 22, the CED product was introduced to the American market with 100 software titles.



Technological executive work station manufactured by Specification Built Corp. Carlstadt, NJ, demonstrates versatility with systems analysis by Environetics Management Technology. This multi-faceted unit includes equipment from seven different electronic firms. There are two microcomputers; a satellite video-conferencing facility; digitizing pad; and information retrieval and high speed printing system, and no less than four graphic displays. This unit is described as a forecast of the office of the future with versatile audio, visual and graphics communications and information retrieval capabilities.



JPL's Voyager project engineers use Conrac Series 5000 video monitor made in Covina, CA.

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Interaction Systems Provides Touch-Sensitive Option For Dec VT-100

Interaction Systems, Inc., Newtonville, MA, recently introduced a touch-sensitive CRT option for the popular DEC VT-100* terminal. The option, called the Model TK-2100, provides a human interface to the DEC VT-100 that is easy to use.

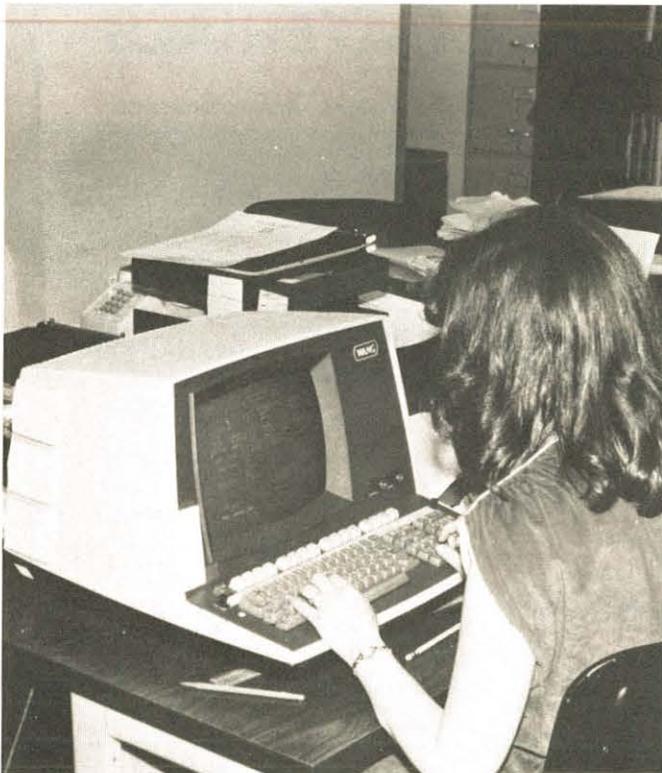
When the TK-2100 touch-sensitive CRT option is added to a DEC VT-100 terminal, people who are unfamiliar with the use of data processing equipment are able to conduct an interactive dialog at the terminal by simply touching, with a finger, data displayed on the CRT screen.

The TK-2100 touch-sensitive option consists of a capacitance-sensitive faceplate, an electronic touch control and interface board, interconnecting cables, mounting hardware, and easy installation instructions. When the faceplate is touched by a human finger, an electronic method under software and micro-computer control is used to identify and interpret the changes in capacitance which are detected. In contrast with earlier techniques for implementing touch-sensitivity, Interaction's capacitance-sensitive technology does not employ mechanical contacts, nor active electromagnetic or acoustic elements. The touch-sensitive medium is entirely passive, and therefore, maintenance free.

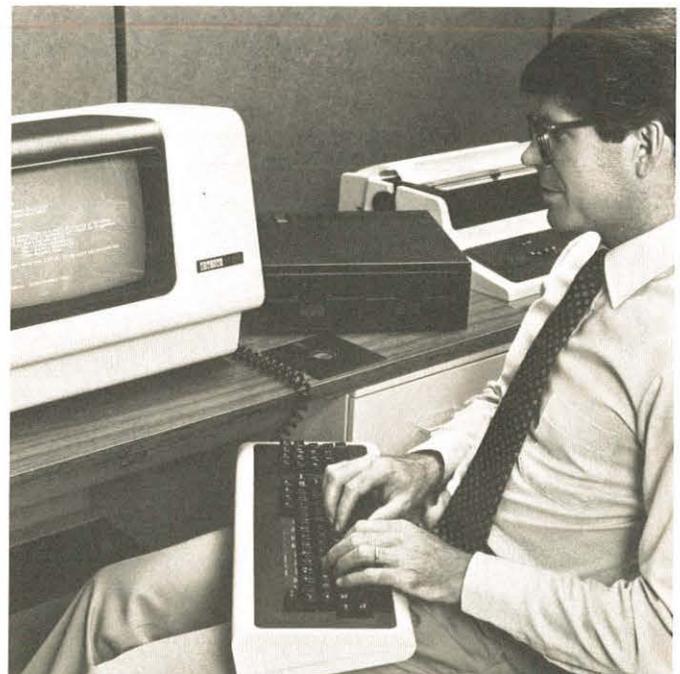
Interaction's TK-100 Series touch-sensitive CRT add-on option has been installed into the Datamedia Colorscan Model 10. The Colorscan 10 is a VT100 compatible terminal with an attractive color display capability. Steve Puchkoff, vice president of marketing at Interaction says, "Combining the eye-catching appeal of a color display, double-height double-width characters, and the simplified human interface of a touch-sensitive display is the state of the art in man-machine design."

Interaction Systems also provides touch-sensitive CRT options available for use with the Lear Siegler Model ADM-32 and Model ADM-42 and other popular computer display terminals.

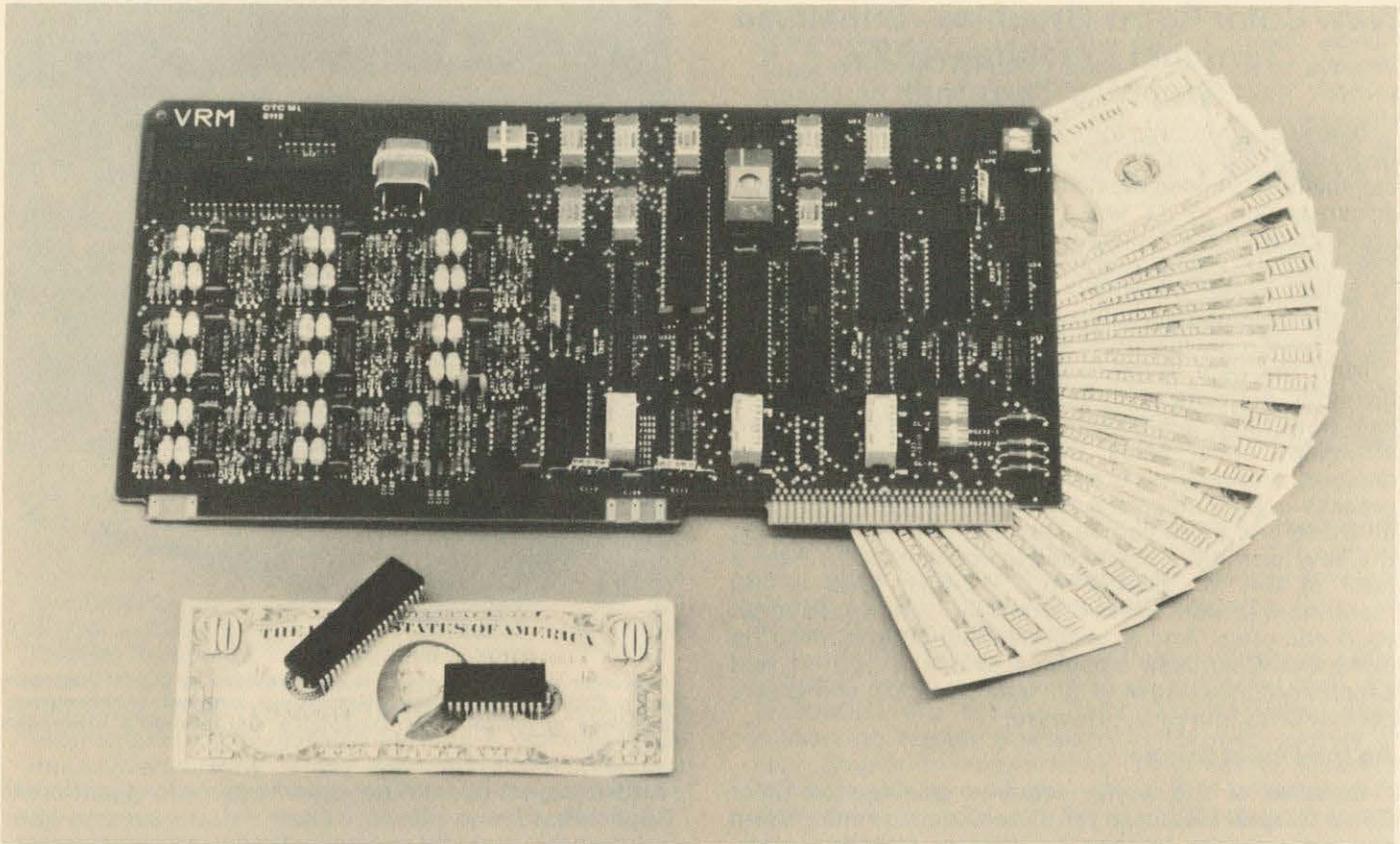
Puchkoff comments, "By making our touch-sensitive products available for more of the widely-used terminals in the marketplace, we are servicing the needs of people who find keyboards to be impractical, cumbersome, or inappropriate to retrieve data from a computer. There is no other technology today which can serve the needs for simplified access to computers, including use by the public at large."



Thirty to forty percent of previous data entry time is needed with the Wang VS's integrated data base, Interstate Hotels Corporation operators do not have to reenter information each time they need to file it into another subsystem.

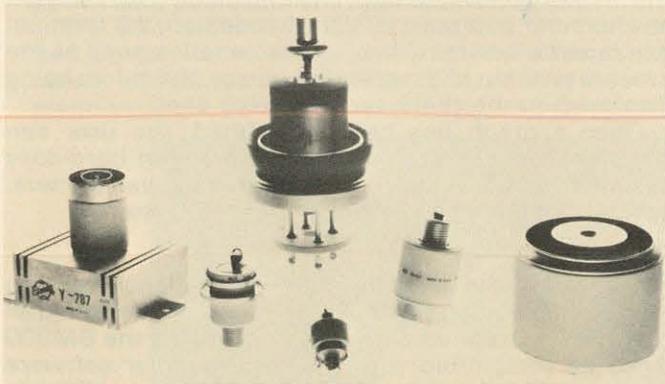


Digital Equipment Corporation's new VT18X option makes personal office computing capability available for the more than 250,000 VT100 video terminals currently installed. The VT18X kit includes a Z80-based microprocessor module, dual 5 1/4" floppy disk drive, associated hardware, documentation, and a diagnostic disk. Equipped to run word processing, financial modeling and other packages under CP/M personal computing software, the VT18X allows the VT100 to act as either a terminal to a larger system or as a stand-alone personal office computer.



Interstate Electronics Corporation's voice recognition products range from eight-word speaker independent voice recognition chips for as

little as \$10 in large quantities to a 100-word voice recognition module Multibus™ board for around \$2000.



Rugged, compact, and reliable, new Varian/Eimac switch tubes are designed for such applications as extended-interaction amplifiers, ion implantation, digital radiography, ECM, lasers, series regulators, and multicolor ground-base and cockpit displays.



Hand-held computer from Quasar Company, Franklin Park, IL, features a 6502 microprocessor, and is programmable in Microsoft™ Basic and SNAP, a FORTH-like language. Optional peripherals connect the computer to large mainframes and databases over telephone lines, and to a conventional television receiver for local display. A thermal printer, RS 232C interface, and extra memory are also available.

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New Color Retro-Graphics™ Enhanced Terminal Emulates 4027 Graphics Terminal

Digital Engineering, Inc., Sacramento, CA, a leader in upgrading alphanumeric terminals to full graphics capability, has added the Color Retro-Graphics™ terminal enhancement to its fast-growing line of computer-graphics products. Basically an emulator of the popular Tektronix 4027 color-graphics terminal, the new system — called Model DM800 — is being offered, together with the Datamedia™ terminal for which it was designed, for an extremely low price according to the maker.

With the new Retro-Graphics enhanced Colorscan terminal, both the business and scientific community can now have a full-color graphics capability at an affordable price. Sales and financial charts, circuit designs, engineering drawings, topological mappings, process-control diagrams, abstract physical concepts — all these and more can be programmed and drawn on the new terminal. By selecting up to eight colors (from a total of 64) for display on a 12-inch (640 x 480 resolution) screen, users can make images appear both vivid and crisp. And to properly label all graphics, the enhanced-Colorscan system provides a built-in text capability consisting of ASCII, math, and APL characters permanently stored in firmware.

An Intelligent System

Because of the newly acquired intelligence Color Retro-Graphics adds to the Colorscan terminal, users can now render images by directly plotting points, describing multidirectional vectors of any length, and defining circles or corresponding arc segments of any diameter — all precisely programmed in the terminal's permanent firmware. For complex patterns, any combination of these is possible. For example, regular polygons of any size — from triangles and squares to multi-sided configurations that approximate circles — can be quickly drawn with just a few simple instructions. And once the graphic is done, it can easily be filled in with any of the 64 available colors.

To complement and enhance the three built-in character sets (ASCII, math, and APL), the upgraded Colorscan terminal can provide italics, text rotation and reversal (right to left), proportional spacing between characters, and variable text height and width with vector-generated characters — important features that enable users to either stress the importance of selected text, or tailor labels to fit into available areas.

Other functions that can be performed on the new terminal include block transfer of data (by data-compression techniques), block copy of data (from one part of the screen to another), and creation of screen "windows" (to allow for multiple graphs on one display, for example). In addition, a user can selectively erase any part of a graphic (to incorporate changes), add text on top of color, and choose from any one of eight programmed line types (solid, dotted, dashed, and dot-dash combinations).

To input graphics data accurately, a standard crosshair cursor can be easily guided across the screen, or the user can use an optional light pen for menu selection or a bit pad for fast entry of X-Y coordinates.

Firmware-resident capabilities such as those provide more power and speed to the graphics-terminal user — unlike software dependent graphics, which place great demand on the host computer and are slow to operate in multi-user environments.

Easy and Efficient Operation

Operating parameters of the new terminal go beyond those available for many more expensive terminals.



Full-color graphics capability is now provided by Digital Engineering's DM800 Color Retro-Graphics™ terminal enhancement, designed specifically for Datamedia Corporation's Colorscan terminal.

After designating terminal specifications for a particular application (baud rate, for example), a user can later request the terminal to display these same parameters to assure that they have indeed been programmed.

Users can also test the terminals to make certain that the memory is functioning, and that all 64 colors as well as character sets are available. In addition, the terminal can report on certain "live" characteristics, such as the present position of the graphics cursor, the colors being displayed, or the character sets being used.

Once a graph has been completed, the user can transfer the full-color image to a variety of hard-copy systems, including matrix-impact printers, pen plotters, special cameras, and high-speed ink-jet systems.

Software Compatibility Saves Money

To facilitate the use of the many applications programs now on the market, Digital Engineering has designed all of its Retro-Graphics packages — including the DM800 — to be compatible with the most popular software available. This includes ISSCO's DISSPLA and TELLGRAF and Tektronix' PLOT 10. As a result, users will save on the cost of redeveloping long and tedious programs that have already proven successful, while continuing to create new programs with familiar software systems.

As an optional feature, Digital Engineering is offering a complete software package — called PLOTPAK™ — that makes it even easier to use the Color Retro-Graphics system. PLOTPAK is a set of graphics routines that can help the user to get bar charts, pie charts, and other images on the screen fast. It features "windowing" and "clipping" of the virtual plotting surface. Thus, the user can zoom and pan through the virtual image rapidly by selecting a portion of the virtual plotting surface and mapping it into a viewport on the terminal screen. And PLOTPAK helps do all this without modifying the original data.

In addition, PLOTPAK features error-checking, immediate signaling if input data is incorrect, and facilitating rapid debugging of applications programs. PLOTPAK software also supports any drivers necessary for all Retro-Graphics enhanced terminals and peripherals.

Chapter News

(Continued from page 20)

prototype seven-segment display was described. Robert Giglia discussed performance improvements in WO₃ electrochromic displays and how the problem of WO₃ film degradation with sulphuric acid electrolyte was overcome by employing polymeric proton conductors. Utilizing a novel carbon paper counter-electrode, the new electrolytes foster simple construction and long switching life. Device design and performance were discussed.

On December 12, Thomas C. Maloney, Manager, Development Engineering, Burroughs OEM Corporation, spoke on "Evolution of Plasma displays at Burroughs OEM Corporation". Burroughs Corporation has been producing gas discharge displays for 25 years. During that period, their display product line has evolved from the relatively simple discrete NIXIE® numeric indicator to sophisticated multi-axis addressed plasma displays. Maloney traced the growth in technology over the years with each new product introduction, which has culminated in their recently disclosed SELF-SCAN® with memory display technology. Thanks to Peter Hahn, Chapter Treasurer, for these good reports.

DELAWARE VALLEY CHAPTER on January 20 heard a most interesting discussion by Paul F. Schuler of the Pennsylvania, New Jersey, Maryland Interconnection, an integrated power pool. Formed by contractual agreement, it coordinates the bulk power supply from 11 investor-owned public utilities serving Pennsylvania, New Jersey, Maryland, and Delaware. PJM member companies can provide more reliable and economic power as a pool than as individual companies.

The Interconnection Office provides the personnel and equipment to monitor the bulk electric system, coordinate scheduling of generation, coordinate future planning, plan for better overall system performance,

and account for the energy interchanged by the companies. About 1/3 of the staff at the IO works in support of the computer system. The power system is monitored by a 370/158 computer. The "offline" computer system, a 370/168, used for engineering studies, accounting, and program development, is able to run the "online" control system, in the event of the failure of the 158.

The primary man-machine interface to the online control system is provided by 13 digital TV monitors. Two Aydin display generators are used to drive these monitors, with one "D.G." serving as a spare. Each D.G. is interfaced to both the 158 and the 168, and both computers may access the TV system simultaneously. A direct interface to the D.G.'s has one C.I.A. interface to each CPU and one C.I.A. as a cold spare. Much of the original testing of this channel interface was done using the IO computer facilities.

LOS ANGELES CHAPTER. On January 20 there was a highly interesting talk and demonstration of the world's largest one meter x one meter plasma display developed jointly by Magnavox Electronic Systems Corp. and Photonics Technology, Inc.

The display features 0.5mm line spacing over a 60cm x 80cm active area. A built-in processor and drive electronics are encased in a window frame design preserving display transparency for map overlay and rear projection applications. Graphics composition, dynamic editing and two-way digital communication make the Tactical Display System (TDS) ideal for military applications.

The presentation was given by Donald Willis, Manager of Advanced Tactical Systems, Magnavox, Ft. Wayne, IN. Thanks to Kevin Kilcoyne, Program Chairman, for this information.

In the March issue you will find a detailed feature story on Magnavox-Photonics plasma displays of various sizes for a variety of applications.



Third-generation — The newest member of Diablo's expanding 630 family of 32 to 40 cps fully formed character printers is the Model 630 KSR. It offers a comprehensive set of terminal communications capabilities which include a 16 byte input buffer, an expanded

2,688 byte print buffer, word processing firmware features, extensive diagnostics for host control, and transmission rates ranging from 110 to 9600 baud. Diablo Systems, Inc., a Xerox company, is located in Hayward, CA.

New Biomatic Accessory Facilitates Remote Diagnostics of Computer in Field

The Biomatic Operation of Gould Inc.'s Instruments Division, Santa Clara, CA, recently introduced its T12 communicator, which enables two logic analyzers to exchange data over a telephone line to permit remote service of digital electronic equipment.

The T12 combines a 1200 BPS half-duplex modem, which conditions signals prior to the movement of data over a telephone line, via a microprocessor-based controller, which manages the interface between an internal modem and the GPIB interfaces of the logic analyzer.

The T12 is an outgrowth of Biomatic's work with a concept known as Remote Logic Analysis GPIB System (ReLAGS). This system enables an engineering expert at a computer or other digital equipment manufacturer's facility to perform fault diagnoses on field-installed products without traveling to the user's site. It permits the expert to remotely perform all logic analyzer tests that could be done at the customer's location, and analyze the results.

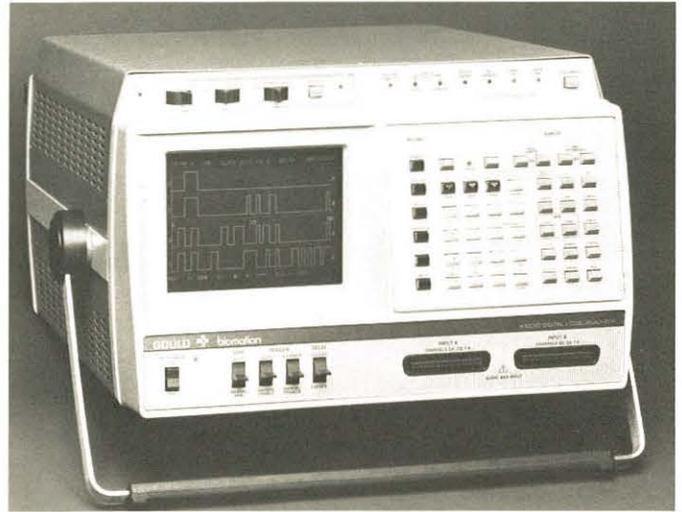
"Besides eliminating the time and expense involved in traveling to the field site, this remote diagnostics capability reduces system 'down time' for the customer," says Edward Jacklitch, Biomatic's marketing manager.

"Previously, to implement such a remote diagnostic system, it was necessary for a user to deal with several vendors to obtain the equipment needed, since Biomatic only supplied the logic analyzers. With the T12, we now provide the entire system, and get it into operation faster than if the user had to configure it," Jacklitch explains.

The T12 Communicator features four operating modes — automatic self-test, built-in voice transmission capability, an automatic answering feature and an error-detection/retransmission protocol.

When a system fault problem is beyond the scope of the field maintenance personnel, it becomes necessary to contact the engineering expert at the factory for help. Since the expert has comprehensive knowledge about the overall system, he can instruct the field people where to attach the logic analyzer's probes to the remote system. The logic analyzers used for the system are two Biomatic Model K100-Ds, powerful instruments which not only perform hardware timing analysis but also trace the dynamic execution of software.

Besides offering send and receive modes for communicating data, the T12 allows the troubleshooter to program



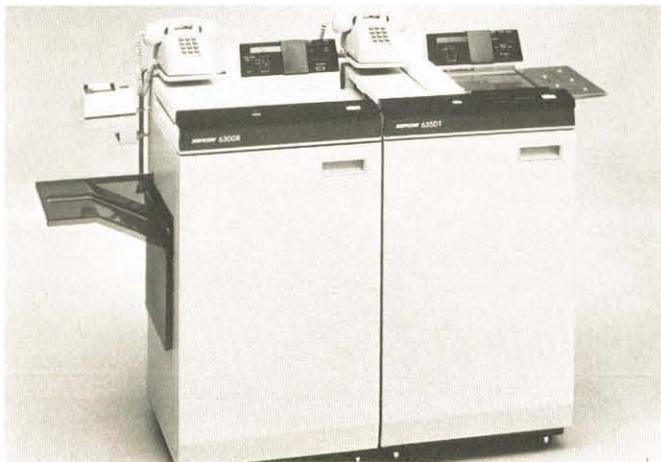
Decreasing downtime and field support cost is purpose of Gould Inc./Biomatic Operation's new T-12 communicator.

and set up measurement parameters on his analyzer, transmit those instructions to the customer's analyzer, make recordings, and have the recorded data relating to the faulty system communicated to his instrument for display. Using his analyzer, he can massage or reformat the data, compare it to good data, and develop a diagnosis.

With the T12, the user has two options when issuing recording commands to the customer's logic analyzer: he can send a command for a recording and have the entire memory contents (or a selected portion) of the remote analyzer sent to, and displayed on, his analyzer. Or, he can have a reference memory with known good data loaded in the distant analyzer and begin a recording until the known reference data either does or does not equal the other current system data in the analyzer. An automatic stop condition halts the recording, and the comparative memory contents are transmitted and displayed for review by the factory expert in his analyzer.

A series of self tests, performed during power-up, and automatically thereafter at regular intervals, assures the reliable operation of the communicator. Besides checking indicator LEDs and switches, these tests look for any errors in each of the three 4K-bytes PROMs and three 256-byte RAMs which comprise the T12's memory. In addition, the GPIB lines are tested individually.

The T12 permits voice or data transmission over the same telephone line.



Rapicom 6350T/6300R full duplex digital facsimile transceiver/receiver system.

Full Duplex Digital Facsimile System Available From Rapicom

A digital facsimile system featuring full duplex and automatic reduction capabilities has been introduced by Rapicom, Inc., Fairfield, NJ, Designated model 6350T/6300R transmitter/receiver, the Rapicom system is said to provide subminute speed and optimum cost-efficiency for highly active electronic mail networks.

While simultaneously accommodating two-way information traffic for enhanced operation versatility, the system can transmit oversized documents ("B" size) for automatic document reduction in a convenient 8½" wide ("A" size) format at the receive terminal.

The Rapicom 6350T/6300R offers a 9600 bps stepdown modem and multiple resolution transmit modes — high speed (15 seconds), standard (22 seconds) and fine detail (38 seconds). There are also selectable contrast levels for light, normal, or dark originals.

Ethernet/Unix Local Computer Network Delivers Electronic "Mail" at Comdex

Electronic messages zipped back and forth over a single yellow Ethernet™ coaxial cable snaking between several exhibits at the computer Dealers Exposition in the Las Vegas Convention Center. The messages were being sent and received on computer systems equipped with Ethernet controllers and transceivers, and were located at each of the participating booths.

In addition to the Ethernet local computer network hardware, each computer system was running a UNIX™-based operating system plus 3Com Corporation's UNET networking software. The UNIX-based operating systems were XENIX from Microsoft and DYNIX from Santa Cruz Operation and Tymshare.

This arrangement permitted these systems both to coexist on the same cable and to pass messages and files among them. As such, it is the first public demonstration of a multivendor Ethernet/UNIX local computer network.

3Com Corporation, Mountain View, CA, organized the network and supplied the Ethernet hardware and the UNET software to each participant. The Ethernet UNIX network connected the systems at the 3Com, Lifeboat, Micro Focus, Microsoft and TRW booths. Messages could be sent from any station to any or all other stations and recipients could claim their individual messages by typing in their names at any one of the system terminals.

Networking Via Emerging Standards

"The real point of the demonstration is to show a 'turnkey multivendor' local computer network," said



One of the Comdex Ethernet message stations consists of a DEC VT103 terminal with a plug-in LSI-11 processor. It is also equipped with 3Com's new Q-bus Ethernet controller and UNET software running with the Xenix operating system.

William Krause, president of 3Com Corporation. "It is easier to design a proprietary network where the single vendor controls the form and function of all the hardware and software. It is quite another task to design a network where the individual needs of many vendors are not compromised.

"One solution is to design a network based on concepts and technologies that are standardized and offer broad appeal because they pose few constraints. Ethernet and UNIX are two such emerging standards and are key ingredients in this demonstration," Krause explained.

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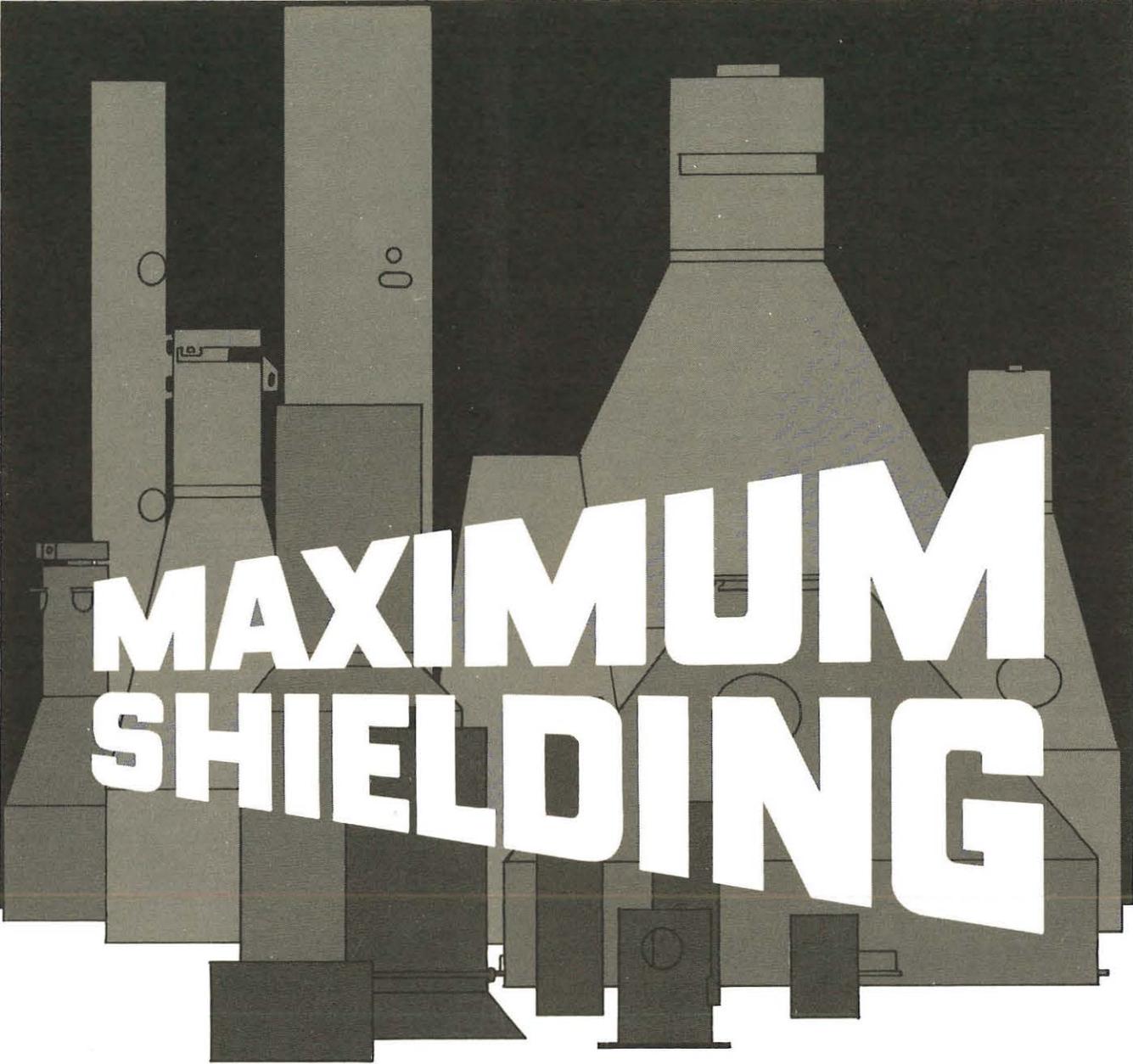
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SID CALENDAR
FEBRUARY to JULY 1982

1982		
February	15	National Ballot Mailed
March	5	Post-Deadline Papers for SID 1982 International Symposium
April	1	Proceedings, Volume 23, No. 1, 1982, Mailed
	12	National Ballot Return Deadline
	20	Quarterly Chapter Rebates Mailed
May	9	Executive Committee Meeting
	10	National Board Meeting, San Diego, CA.
	10-14	SID 1982 International Symposium, Town and Country Hotel, San Diego, CA.
July	1	Proceedings, Volume 23, No. 2, 1982, Mailed
	20	Quarterly Chapter Rebates Mailed

OTHER EVENTS

1982		
April	4-5	Office Systems Research Conference, San Francisco
	5-7	Office Automation Conference, San Francisco
	22-25	New York Computer Show & Office Equipment Exposition, Nassau Coliseum, Uniondale, Long Island, NY
	27-29	INFO/Manufacturing, Chicago
June	2-4	ACM/SIGMOD International Conference on Management of Data, Orlando FL
	17	ACM/NBS Symposium: "Computing and Government", Gaithersburg, MD
July	26-30	SIGGRAPH '82, John B. Hynes Veterans Auditorium, Boston



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GREETINGS TO NEW SID MEMEBERS!

Each month you'll find a roster of new SID Members, listed by Chapters with the Chapters in alphabetical order. If your name — or a friend's — should have been listed and was inadvertently omitted, please let June Friend or your Editor know immediately. We'll make amends in the next issue. See the front cover for your choice of addresses to which to send vital data.

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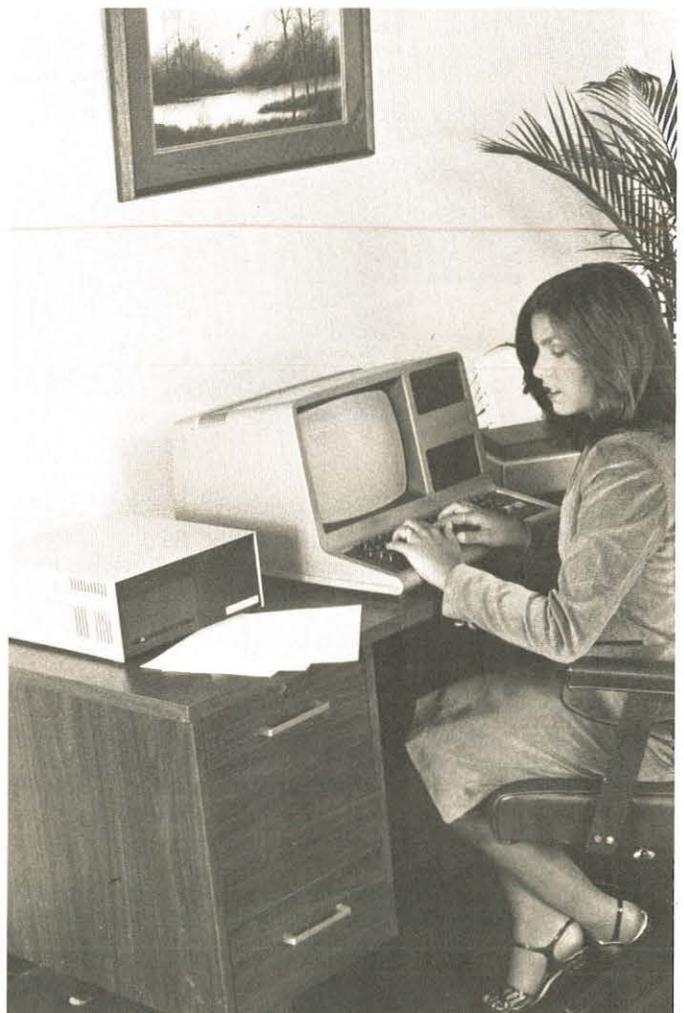
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A new graphics option from Okidata Corporation, Mt. Laurel, NJ, enables Okidata printer users to print images that appear on a CRT screen, from Churchill to charts. Called Dot-Addressable Graphics, the package translates data displayed by a computer into parallel data that can be used by Okidata's Microline printers to reproduce the CRT image on plain paper. The package is standard on the Microline 84 and an option to the Microlines 82A and 83A.



The LS525, 5 megabyte hard disc memory from Laredo Systems, Santa Clara, CA, offers personal professional computer users intelligent, high-speed, reliable, and economical data storage.



New Eraser/Simulator/Programmer, from Hughes Aircraft Company's solid state products division, supports the company's currently available EEPROMs, plus additional non-volatile memories planned by Hughes. The microprocessor-controlled smart programmer, designated H3000 ESP, can erase, program, read, copy simulate, modify, and compare a variety of PROMs, without requiring personality boards, hardware changes, or switch settings for different memory and parameter selections.

New Smart Programmer Is Offered By Hughes

A new eraser/simulator/programmer (ESP) has been introduced by Hughes Aircraft Company's solid state products division, Newport Beach, CA, to support the company's growing family of non-volatile memories.

A new intelligent programmer, designated the H3000 ESP, is a micro-processor-controlled unit that requires no personality boards, hardware changes or switch settings for different memory and parameter selections. It is designed to evaluate the capabilities of currently available Hughes EEPROMs, including the 3004, 3008, 3704 and 3708, as well as additional non-volatile memories the company plans to offer in the near future.

The H3000 ESP provides the necessary modes to

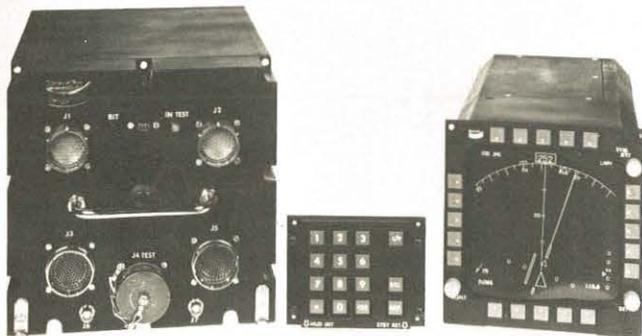
erase, program, read, copy, simulate, modify and compare the various Hughes EEPROMs and industry standard UV-PROMs. In addition, a self-test feature runs a complete automatic check with power on and displays the results on the unit's 16-character dot matrix liquid crystal display.

The programmer has a 4Kx8 static RAM buffer expandable up to 8K x 8. The starting address for the buffer is software-selectable, and programming and editing are possible on any PROM by using available memory. A smart and adaptive programming sequence minimizes programming time by automatically deciding what bytes need to be programmed and whether it can be done without erasure.

Prompter messages on the display guide the operator through each mode of operation without the need to refer to the manual. Selection of PROM types and data transfer port characteristics are controlled by software, and the last selected parameters remain in the memory until they are altered or the power is turned off.

A 28-pin simulator cable plugs into the user's PROM socket, allowing programs to run through the H3000 RAM buffer, with access time of 350 nanoseconds or less. Fast data transfer in both directions is allowed through an RS232C and a parallel I/O port. Start and end address of the block can be user-specified, and baud rate, parity and bits/character are keyboard-selectable.

The H3000 can be used to provide a number of functions such as an aid in program development and check-out, a functional tester for incoming inspection, a remote programming unit, a field service tool, and a production programmer. Via special command, the user can execute his own application programs written for the Hughes 1802 microprocessor in the H3000 buffer, allowing use of the H3000 microcomputer for the user's special application.



New Fighter Cockpit Display and Control Set

Bendix Flight Systems Division, Teterboro, NJ, has been awarded a contract by Northrop Corporation to develop and produce a digital display and control set for the F-5G Tigershark tactical fighter aircraft.

Included in the digital display and control set are dual digital display indicators, a display processor and a data entry panel. The Bendix digital and control set is a fully redundant, multi-function display subsystem and is part of an integrated avionics package for the F-5G Tigershark.

The first Tigersharks are now in production at Northrop's Aircraft Division in Hawthorne, CA. First flight of the Tigershark is planned for September 1982. Fully qualified, combat-capable F-5Gs will be available for delivery less than a year later, in July 1983.

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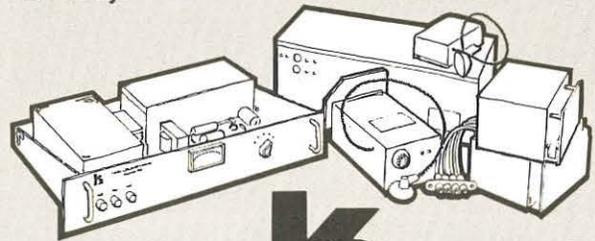
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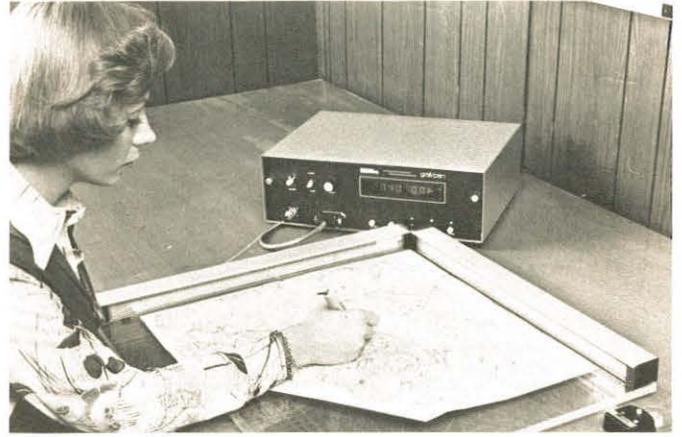
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SAC® Microprocessor-Based Sonic Digitizers Now Offer Improved Resolution

Science Accessories Corporation, Southport, CT, recently announced the optional availability of significantly improved resolution for its Model GP-6-30, -40, and -50 sonic digitizers.

Each of these microprocessor-based models is optionally available with 0.005" resolution, rather than the standard 0.01." Permitting more counts per measured inch, the optional resolution provides advantages for digitizers users with high-precision applications. In essence, the 0.005 allows the plotting of a maximum of 500 individual points per inch, while the 0.01 resolution plots 100 points per inch.

These sophisticated microprocessor-based digitizers automatically perform mathematical computations previously requiring external processes or hand calculation. An L-frame sensor assembly borders the active work area, allowing interaction with a variety of images, such as CRT or plasma displays, projected images from X-rays and films, and maps or drawings on drafting tables. The unencumbered work area covered by movable or fixed sensors accommodates squares, triangles, and other drafting instruments. Points on the plane that could be digitized, which may measure up to 36" x 36", are



Each of the microprocessor-based sonic digitizers in the Science Accessories' GP-6 series are now available with optional 0.005" resolution for use in high-precision applications. The option provides up to 500 measured points per inch, compared to the standard 100 points per inch, 0.01" resolution.

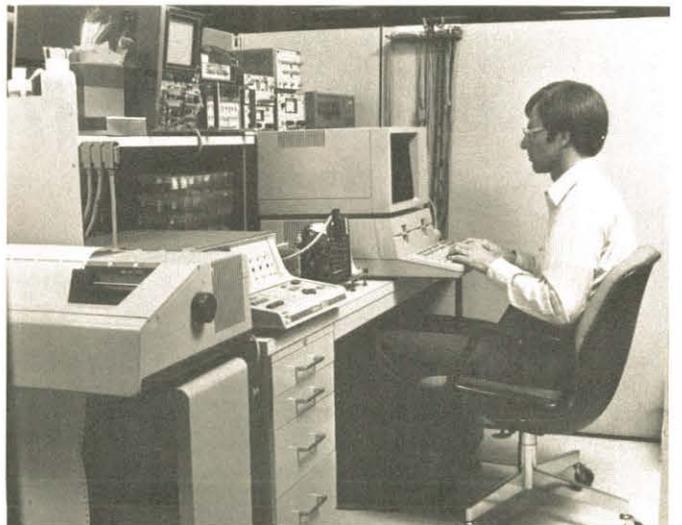
located by a stylus or cursor, with the output in cartesian (X-Y) coordinates, compatible with RS-232 or IEEE 488-1975. Depending upon the specific model, SAC GP-6 series digitizers may provide origin offset, incremental mode, area calculation, and full menu capability.



FailSafe System Introduced by Dosc, Inc. The FailSafe on-line computer system, said to incorporate significant advances in automated software development and fail-safe hardware architecture, has recently been introduced by DOSC, Inc., of Albertson, N.Y. Shown are system workstations (left), a high-speed printer, and fully-redundant data base discs and data base manager computers (right).



Enhanced by seven application software packages, an upgraded operating system and a 5-megabyte mass-storage system, the Apple III is a computer designed for professional end users as well as OEMs and systems integrators, the maker states.



New HP 983A desktop computer, with 12-inch CRT screen, the availability of Pascal, and dual 5¼ inch flexible disc drives, is designed specifically with computer-aided engineering and computer-aided test applications in mind.

No. 1



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Chapter News



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Dr. I. Ohishi
Chairman, Japan Chapter
Executive Chairman,
Japan Display '83

Speaker
Dr. M. Fukushima
Chapter Committee Member
General Secretary, Japan
Display '83, reporting on the
Eurodisplay '81

JAPAN CHAPTER on December 22 enjoyed a technical meeting attended by 23 SID Members and 40 guests. The following is the meeting program:

1. A Refresh Addressing Technique of AC TF-EL Panels, Keizo Kurahashi, Kazuhiro Takahara, Fujitsu Laboratories, Ltd., Kobe.
2. Liquid Crystal Multicolor Display, Tatsuo Uchida, Tohoku Univ., Sendai
3. Contrast Ratio Evaluations of Phase Change Type GH Color LCD Kenkichi Suzuki, Shinji Hasegawa, Hitachi Ltd., Mobarra
4. Reports on the Eurodisplay '81 (1st European Display Research Conference)
 - 4.1 General Review
 - Session B Light Modulators, Shunsuke Kobayashi, Tokyo Univ. of Agriculture and Technology, Tokyo
 - 4.2 Session A Liquid Crystal Displays
 - Session C Electrochemical Displays
 - Shoichi Matsumoto, Toshiba Corp., Kawasaki

- 4.3 Poster session — Liquid Crystal Displays
Tatsuo Uchida, Tohoku Univ.
- 4.4 Session G — Plasma Displays
Poster Session — Human Factors
Minori Yokozawa, NHK Tech. Res. Labs., Tokyo
- 4.5 Session E — EL Displays
Session F — CRT and VFD
Masakazu Fukushima, Hitachi Ltd., Tokyo
- 4.6 Session H — Addressing
Poster Session — Addressing
Keizo Kurahashi, Fujitsu Laboratories, Ltd., Kobe

Thanks to Ryuichi Kaneko, Chapter Secretary, for this detailed report and the photograph.

MID-ATLANTIC CHAPTER on January 12 enjoyed a valuable meeting as Robert Giglia of American Cyanamid and Dr. Joseph Shay of Bell Labs gave a presentation of their work in electrochromics display advances. Dr. Gottfried Haache of Cyanamid introduced the speakers.

Dr. Shay discussed the desirable properties of iridium oxide as a passive display medium. It is exceptionally stable and has a fast intrinsic response above -20°C . A

(Continued on page 11)

University Seminar Speakers Wanted

At the SID Board meeting on January 22 in San Diego, it was decided that the Society wants to establish closer relations with universities. The concept of this movement forward is:

1. We need SID Members who are willing to give seminars at universities for the benefit of students interested in display technology and engineering.

2. We need the subject of your expertise on which you are willing to present a seminar. Please send your name, subject, short biography, and preferred location to:

Dr. Werner Frei, Associate Director
University of Southern California — MISG
Marina del Rey, CA 90291
Phone: (213) 822-9121

INFORMATION DISPLAY

FEBRUARY 1982

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