

≡ Official Monthly Publication of the Society for Information Display

INFORMATION DISPLAY

April 1987
Vol. 3, No. 4



Silver anniversary issue
Sol Sherr on 25 years of displays
Robert Knepper on SID's 25-year history
Interviews with industry leaders
Lew Winner and SID

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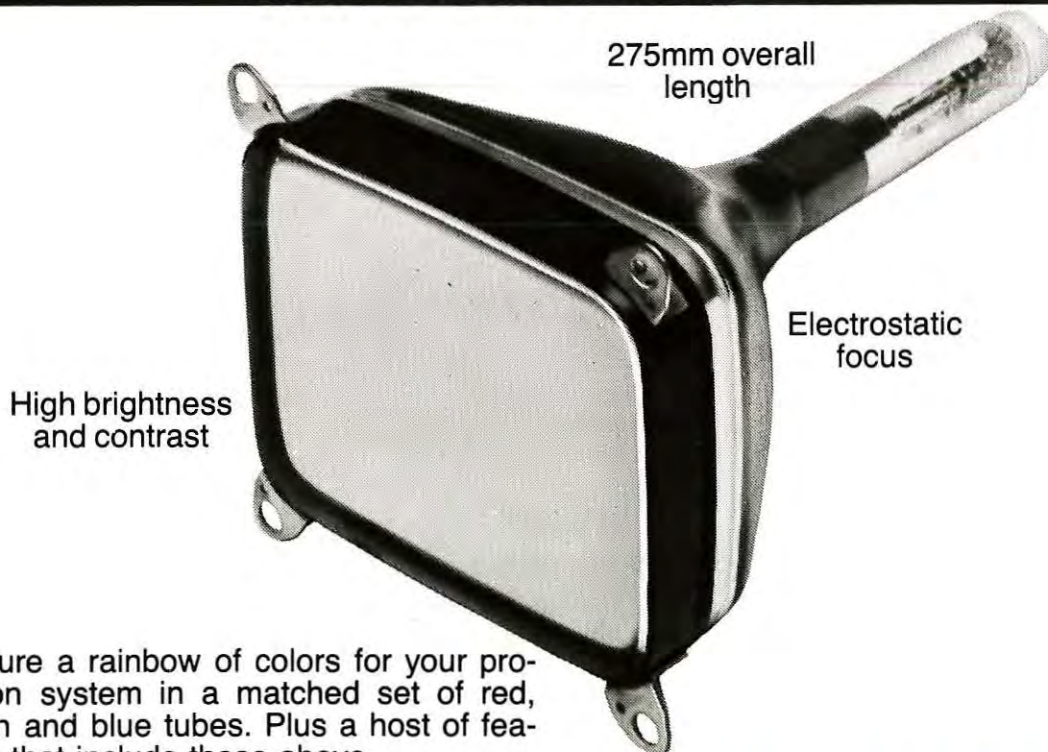
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INFORMATION DISPLAY

APRIL 1987
VOL. 3, NO. 4

Cover: The computer revolution spawned an industry and brought displays into the work place. Computer graphics by Don Shankoff displayed on the NEC MultiSync™ monitor.



Next Month in Information Display

SID '87 Show Issue

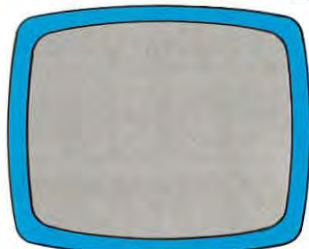
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- 3-D display technology
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A SID member recalls the people and inventions that have shaped our industry during the last 25 years.
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Ever wish your CRT screen was just a little larger?

Clinton Electronics' new 15-inch, 90-degree, 20 mm cathode ray tube gives you all the advantages of the popular 14-inch CRT and more! It gives you 18% more useful screen area!

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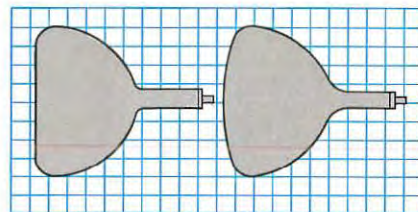


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A silver anniversary is a good reason to celebrate, and in our case that reason is even better than usual. It was 25 years ago that the Society for Information Display was founded, and during the intervening quarter century technology, particularly that incorporating displays, has been transformed. SID has been a crucial part of that transformation, and its meetings have been the premier forum where display developments have been discussed and introduced.

We celebrate with four unusual articles. First, Sol Sherr recalls 25 years of display development. Then, Bob Knepper, SID's official historian, sketches the development of the Society. We then present 25 capsule interviews with 25 leaders of the display community. We asked each of them the same four questions, and some of the answers may surprise you. In any event the variety of those answers provides a lot of insight into SID and the development (and future) of the technology it serves.

Finally, we talk with and about Lewis Winner, who helped bring the Society a large measure of its success, but is now critical of SID. Interestingly, his criticisms are echoed by some of our interviewees, not a few of whom are present or past officers of the Society.

So, this is one anniversary where, in addition to popping the cork and downing a few glasses of champagne, we also take the time to look seriously at our past and future. We hope you'll find the effort entertaining and provocative.

Sarnoff Research Center given to SRI

General Electric Co. has donated the 350-acre RCA David Sarnoff Research Center in Princeton, NJ, to SRI International, and will fund approximately \$250 million in research contracts there over the next five years. Under the agreement, the Sarnoff Center, which became part of GE through the June 1986 merger with RCA, would become a major laboratory site in SRI's worldwide network of laboratories and research centers.

In explaining the move, GE Vice Chairman Edward E. Hood said, "It enables SRI to dramatically expand its ability to provide research to a broad base of clients at the same time we are assured continuity in our consumer electronics research. Because of our extensive existing R&D capability, it was not feasible to operate both the Schenectady and Sarnoff facilities; nor did we want to break up a great research team by assimilating the work into GE and then closing the Sarnoff facility."

SRI International plans to offer employment to approximately 900 of the Center's 1200 employees. GE will assume responsibility for severance benefits for those employees not offered positions at SRI. The consumer electronics satellite R&D laboratories are not part of the donation and will continue to be operated by GE's Consumer Electronics Business. It is expected the property will be transferred prior to April 1.

Hartman awarded Navy contract for color monitors

Hartman Systems, Huntington Station, NY, has been awarded a \$2.1 million contract by the Naval Avionics Center (NAC) of Indianapolis. The contract calls for 50 13-in. full-color MIL-qualified color monitors for use in the Fleet Electronic Warfare Support Group's Airborne Electronic Warfare System. A Figgie International Company, Hartman Systems is a leading supplier to the DoD and a prime military contractor for display systems, control systems, telemetry systems, and special electronics.

Federal emergency information now PC-accessible

As of February 4, 1987, the computer system of the Federal Emergency Management Agency (FEMA), once accessible only through expensive dedicated graphics terminals, can now be accessed from an IBM PC XT. The IEMIS software, which resides on a DEC VAX 750 minicomputer, incorporates such graphics-intensive programs as mapping, hazards, databases, and exercise and event simulation. Users can access the centralized IEMIS system at about \$2500 over the cost of the standard PC by installing Grafpoint's TGRAF-07 graphics terminal emulation software. Users retain the benefits of the multi-functional desktop computer, while gaining the ability to simulate emergencies, exchange electronic mail over the IEMIS network, display maps, and model meteorology/dose levels. The program supports all Tektronix-compatible mainframe and minicomputer graphics software.

In Memoriam

It is with profoundest sorrow that SID notes the death of Dr. James H. Becker. An active SID member of long standing, Dr. Becker served as Treasurer for the Bay Area Chapter, as Chairman of the SID Program Committee in 1972, and as Symposium Chairman in 1973.

Dr. Becker received his Ph.D. in Physics from Cornell University. He worked for the Xerox Corporate Research Group for many years at their Rochester, Dallas, and Palo Alto offices, and was most recently affiliated with the Lockheed Corporation. A solid-state physicist in the field of displays, Dr. Becker was expert in electrophoretic and matrix-addressing technology, and was a pioneer in U.S. research and development in LCDs in the early 1970s.

All SID members, friends, and colleagues of Dr. Becker wish to extend their sincerest sympathies to his family. He will be greatly missed by many.

FEMA officials caution that the PC-based system may not support all applications of the IEMIS system. Potential users should check with the agency if highly specialized applications are involved. Contact B. T. Marking, FEMA IEMIS Network Manager, 202/646-2870. TGRAF-07, priced at \$995, is available from Grafpoint, 4340 Stevens Creek Blvd., San Jose, CA 95129. 408/249-7951.

Leading French producer of lasers incorporates in U.S.

Cilas Alcatel has incorporated in the U.S. under the name of Cilas, Inc. The newly formed company will market a line of YAG and CO₂ surgical lasers for medical applications and a line of advanced continuous-tone imaging and facsimile products for OEM and end-user medical, government, military and publishing applications. "We have established a strong development and support network to provide comprehensive engineering, training and support services directly to our U.S. customers," says Vladimir Nuta, General Manager. Cilas, Inc., will be headquartered at 100 Crescent Rd., Needham, MA, 02194. 617/444-9011.

People

Richard K. Snelling, Executive Vice President-Network at **Southern Bell Telephone**, Newport, RI, has been named "Fiberoptics Man of the Year" for 1986 by the industry newsletter, *Fiberoptic Marketing Intelligence*.

Link Technologies, Fremont, CA, has named **John Petrone** and **Ariz El-Farra** to two newly created sales manager positions, Eastern Regional Manager and Southwestern Regional Manager.

Novell, Inc., Provo, UT, announces the appointment of **D. Mark Calkins** as a Director of Corporate Marketing and Development.

Taliq Corp., Mountain View, CA, announces the appointment of **Mary Noordhoff** as Director of Marketing and Sales in charge of Message Center Displays.

president's message

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This year SID is "one generation" old (25 years) and much has happened in that short time. In many ways, no doubt, SID has evolved far beyond the expectations of Dr. Harold R. Luxenberg, this year's recipient of the Beatrice Winner Award, who founded our Society in 1962. As I think about our Society's history I am also led to consider the much more distant past.

The first week in April I will be visiting my brother in Egypt and I expect to have ample opportunity to see relics dating back as much as 5000 years, or about 200 generations; by comparison everything around here is incredibly young. Of course, during all those years many different cultures have flourished and even a number of foreign peoples such as the Greeks and Romans have left their mark on Egypt, but Egypt is remarkable in that so much remains after 5000 years. I wonder what, if anything, will remain of our society and culture in the year 7000?

The first of April is also important for me personally, for this is when the RCA David Sarnoff Research Center will become part of SRI International, having been "donated" to SRI by GE. I remember well, shortly after starting my career at RCA, when the David Sarnoff Research Center celebrated its own 25th anniversary in 1967. There was much to look back upon and to be proud of: pioneering efforts in materials, optics, communications, radar, and consumer electronics, particularly color television. At that time I was looking forward with excitement to my own career at RCA and eager to pursue new ideas and to solve challenging problems.

Now, less than one generation later, these expectations have come to an end as a result of merger-mania, the wheelings and dealings of corporations and tycoons that occupy fully 75% of the front page of the *Wall Street Journal* every day. Whether friendly or hostile, one must wonder what good will come of all these take-overs, what benefit they offer to our society or future generations. There is a tendency to blame the inevitable destruction of careers and personal lives on competitive pressures; the will of the shareholders is used to justify the dissection of businesses into their components and the disposal of the weaker parts. Words such as "vision" and "commitment" are replaced by "shrewdness" and "financial astuteness."

The achievements of Egypt were the product of a whole nation led by men of vision; I am left wondering "where are those who will build the pyramids of our society?"

Sincerely,

A handwritten signature in black ink, which appears to read "J. Raalte". The signature is fluid and cursive, written in a dark ink on a light background.

A fond farewell to the display industry

In July of 1957, I started with Litton Industries at the Electronic Display Laboratory in Emeryville, California. Sandwiched between Oakland and Berkeley in the San Francisco East Bay, Emeryville is the first place you come to off the Bay Bridge. It was the second location for Chromatic Television Labs, founded by Nobel Laureate Dr. E. O. Lawrence of U. C. Berkeley. Dr. Lawrence had invented the Chromatron, or Lawrence, color tube and he and two colleagues, Dr. Luis Alvarez and Dr. Edwin McMillan, also Nobel Prize winners, had founded the company to develop the Lawrence tube for commercial color TV. Litton bought them out in early 1957 with the idea of applying color displays to military aircraft cockpits. I guess now one would have to say they were about 25 years too early.

One of the first things I did as an engineering assistant back then was to make detail drawings and build a flat-panel display.

Our chemist at the time handed me some sketches of what he wanted done. There were two rectangular glass plates each measuring about 15 cm on the long side. Each had closely spaced wires running the long way, having been placed by wrapping the wires around the plate on a lathe. The wires were then fixed to the plate, cut at each end, and removed on one side.

The plates were positioned together with the wires at right angles and with phosphor sandwiched in between. An appropriate voltage applied between two wires which crossed at right angles would make the phosphor between the wires glow at the intersection. In the area where the wires extended beyond the edge of its companion plate, a plastic cylinder was mounted which had one complete spiral wrap of wire from one end to the other. In any one position, the wire on the cylinder touched one (or several) of the wires on the plate. When the cylinder was rotated the contact point would "scan" down the plate. The cylinders were geared together so that one rotated faster than the other, and, with a sufficient voltage applied to the spiral wire on each cylinder

through a commutator, a mechanically scanned flat EL panel was produced!

Thirty years later, practical flat-panel displays are at last becoming a reality, although in many cases not yet an economical one. I don't remember whatever happened to the mechanical EL panel, but in the meantime one thing led to another. Litton moved the operation across the Bay into its microwave tube plant in San Carlos. The display group, under the guidance of Norman Fyler (recipient of the Zworykin Award for the invention of the curved shadow mask), started making high-resolution CRTs for photorecording. One day I volunteered to write some data sheets, and the rest, as they say, is history.

It was either in 1962 or 1963 that the company sent me to a display course given at UCLA. Teaching the course were people who are now considered the pioneers of SID, including the father of SID, Dr. "Lux" Luxenberg. I joined SID shortly after that, and together with Joe Stafford, then of Litton, helped start the Bay Area Chapter. I also feel privileged to have known Frances Darne, as we did a display contract for her in the mid 1960s.

It has been interesting to watch the display industry for nearly 30 years. Some ideas seem to come around again and again; for instance, the beam index tube. It is interesting to see other things which were thought to be nearly impossible happen thanks to the semiconductor revolution.

I remember one time looking for a character generator. The only one I could find was being marketed by Information Displays, Inc., in New York. I talked to an enthusiastic fellow named Carl Machover. The character generator occupied 5¼-in. of rack panel space.

It reminds me now of an article I saw in one of the "10 years ago" or "20 years ago" columns of *Datamation* magazine. It seems that at that time they had achieved construction of a computer that would fit in the back of a pick-up truck.

I have always felt that the display industry had something special. I remember the microwave tube laboratory in San Carlos. It seemed terribly unexciting because when the tube was working, it

just sat there. With our devices, on the other hand, you could see a picture! A display seems so much more personal.

What has the largest information bandwidth path to the human brain? The eye, of course, making visual displays the best of man-machine couplers. As our machines and number-crunching power expand, the display will assume even greater prominence.

Those of you in the display industry should feel as I do, that you are part of the most exciting segment of today's technological society.

However, after 30 years, it is time to do something different. For those who would like to call and talk about old times I shall initially be taking care of some unfinished business near Tahoe City, California, at beautiful Lake Tahoe, and in the mountains near Angels Camp, about 100 miles below Lake Tahoe.

If you are in those areas after the summer of 1987, drop in and see me. My name will be in the book.

—Jim Wurtz
Litton Data Systems
Tempe, Arizona

Something new in each issue

I would like to tell you how much I enjoy *Information Display*. I always get ideas from it and learn something new in each issue. Also the graphics are superb.

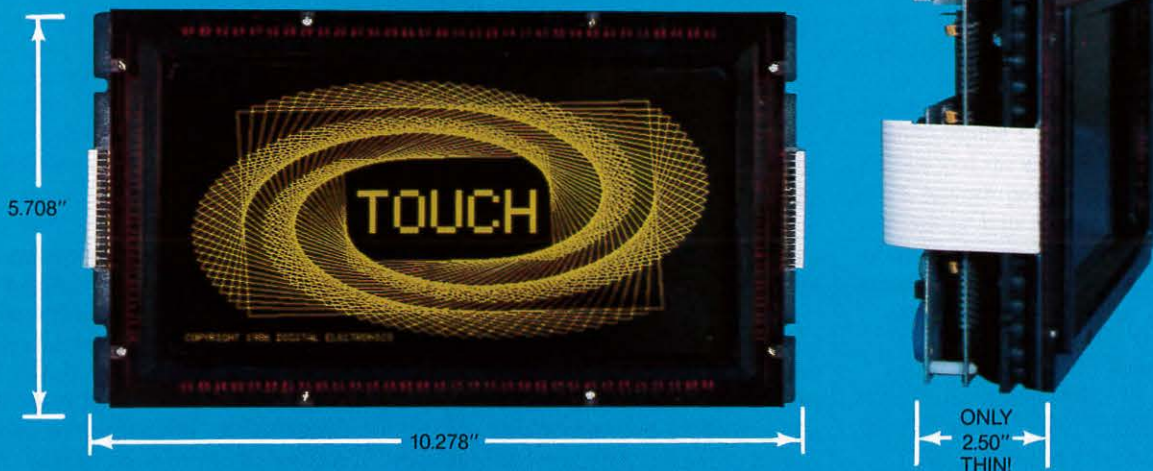
Keep up the good work. You are doing a lot for many people with your journal.

—Barry D. Levin
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Reminiscences of a charter member

BY SOL SHERR

IT'S HARD for me to believe that SID has reached its silver anniversary, because I remember so well its formative stages back in 1962. It also means that I'm 25 years older, which is not a wholly pleasant condition to contemplate. Much has occurred in these 25 years, however, both in SID and information display, and I have been asked by the Editors of this publication to present a few of my thoughts on the significant events and developments over this quarter of a century. Of course, these are strictly personal opinions and recollections.

A few historical notes

The formation and subsequent events pertaining to SID are covered in more detail in Bob Knepper's article in this issue. I was not present at the organizational meeting held on September 29, 1962, where 39 intrepid individuals began the formidable task of creating a new society, but I joined it very soon after, so that I consider myself as one of the founding members if not quite a founding father. The extent of my commitment to the Society is shown by the fact that to my knowledge I am the only one of the original group who still plays an active role, although a number of them are still members. This in no way is intended to denigrate the importance of the contributions made by the others of that group over the years, or the many individuals

Sol Sherr is President of Westland Electronics, Ltd., a consulting firm. He is the editor of the "Proceedings of the SID" and a new series on computer graphics to be published by Academic Press.

who have devoted so much time and energy to making SID what it is today.

In particular, I remember Lux, or Dr. H. R. Luxenberg, to give him his full title, who was one of the founders and the first president, and Rudy Kuehn, who was also one of the founding group and the second president. Another who comes to mind is Bernie Lechner, who first became active in SID at my invitation when he joined the committee for the 11th National Symposium of which I was chairman. When he was chairman, Bernie turned the Symposia from a somewhat haphazard operation run by groups of enthusiastic amateurs into a professional operation when he brought in Lew Winner for the next Symposium, and the Symposia have continued to improve in quality since then.

Why we need more books

Kuehn and Luxenberg edited *Display Engineering*, the first comprehensive book on display technology, and it was an important incentive to me in writing my first book, *Fundamentals of Display Systems Design*. Another book was the one by Harry Poole titled *Fundamentals of Display Systems* that was perhaps the first of its kind and from which I borrowed most of my first title. Other early books were the ones by Admiral Howard and Sam Davis, and more recently my second book, *Electronic Displays*, as well as the most recent one edited by Larry Tannas, *Flat-Panel Displays and CRTs*. There are also several volumes that are collections of papers from various conferences, but the field is hardly notable for a profusion of texts.

Of course, the *SID Proceedings*, the *Proceedings of the International Display Conferences*, and the *Digests* of the SID conferences are important sources of information, but there is certainly room for more texts that could result in the establishment of college curricula concentrating on information display technology. The few isolated courses such as the ones given by Gene Slottow, Roger Johnson, and Larry Weber at the University of Illinois and the short courses run by Larry Tannas, Irv Reingold, and myself among others at different universities are a step in that direction, but much more can and should be done. The various seminars and other short courses are useful as an introduction and updating of information, but they are hardly sufficient in themselves from an educational point of view.

Technological evolutions and revolutions

But enough of the history of SID and a plea for more texts and university courses; the main question is what has happened to technology over these 25 years. Here there have been enormous advances, with technologies emerging and declining at a rapid pace.

One that comes to mind is the invention of the dynamic scattering liquid crystal display by Heilmeyer and his associates and its improvement by the twisted nematic technique by Schadt and Ferguson and many others. Most recently, the ultimate appears to have been achieved in the supertwist versions, first introduced by Schadt and Scheffer and the subject of intense effort by many others. This technique appears to allow multiplex-

ing of LCDs with highly improved contrast ratios and general legibility over the more conventional twisted nematic. The success of this technique is attested to by its rapid adoption as the display for laptop computers by a number of manufacturers.

A related development is active-matrix addressing, first expounded by Fischer and Brody, of which Brody has been the enthusiastic if rather lonely exponent for so many years. Although first developed as a means for multiplexing electroluminescent displays, it has found its main application with LCDs, and its success is attested to by its incorporation into a number of color flat-panel television sets and the enormous amount of work that is going on in many laboratories.

Other nonemissive flat-panel technologies have seen their ups and downs. Prominent among these are electrochromic and electrophoretic devices that evoked considerable interest when they were first reported on by Deb and Dalisa, among others, but have failed to fulfill their promise as yet. One can never predict what advances may occur to bring them back into favor, however; witness the revolution in the use of electroluminescence begun by the introduction of thin-film EL by Sharp. Only time will tell whether electrochromic and EPID will disappear or be resurrected by some future advance, and I will not attempt any prediction at this time. Remember that LCDs appeared to be a failure until twisted nematic was invented, and the latter appeared to be on the way out for panel displays before supertwist and ferroelectric approaches were discovered. Prediction is always a hazardous occupation, especially so in these rapidly changing technologies.

Thin-film EL has been briefly mentioned, but the ac plasma panel is the more widely used of the emissive flat-panel technologies. Its original invention by Bitzer and Slottow was for rather modest purposes, as a replacement for the combination of a scan converter or solid-state memory device with a CRT display to be used for the educational system termed PLATO. It has gone far beyond that limited application and is the most widely used technology for large flat-panel displays to be used in terminals and workstations. Of course, its adoption by IBM has been an important factor in this acceptance, but many other companies also produce ac plasma panels, and it is beginning to appear in laptop displays as

an alternative to LCDs, where its better visibility is considered of prime importance. Of course, it cannot compete with the very low power requirements of the LCDs when battery operation is considered, but it appears to have its place and should increase its share of this market. The same might be said of thin-film EL, and it is of great interest to speculate which one, if either, will be found most acceptable in this type of usage. This is still the subject of much controversy and debate, but it appears probable that each one has its place.

The omnipresent CRT

Next we turn to that old standby, the CRT, whose demise has been so frequently predicted. However, it still remains, by a very large margin, the display of choice for most applications. It is interesting to note that its basic structure has remained essentially the same as it was in its original introduction by Braun 91 years ago, and indeed in many respects it is an ideal display device. Its major deficiencies lie in size and the need for an evacuated envelope, but these have not been sufficient for flat-panel displays to take over to any significant extent. Its excellent visual characteristics and ease of addressing have allowed it to remain far in the lead, and of course its extensive use for television and the ease of obtaining good color have contributed to this prominence.

Many improvements have occurred over the years, with the Trinitron and the new shadow-mask structure, as well as the use of an in-line gun with a predistorted yoke among the most important. The Trinitron remains the sole property of Sony, whose engineers developed it from the original version invented by Lawrence that went under the cognomen Chromatron, but with typical Japanese ingenuity they produced an entirely new structure that should be considered as an original invention.

Other important features of the color CRTs are the increases in resolution allowed by the reduction in pitch of the apertures, the more rigid mask developed by Zenith, and the bowed mask developed by RCA. These latter developments reduce the effect of heating on the alignment of the masks and allow, in conjunction with the in-line gun and the CRT/yoke combination, for improvements in convergence. Taken as a group, these are impressive advances and should result in CRT displays retaining their

leading position for many years.

There has also been considerable effort spent on new flat-panel CRTs, some of them based on the original designs of Aiken and Gabor and incorporated into television sets by Sinclair and Sony. There is also Digisplay developed at Northrop by Goede and his associates, which is the first at least partially successful matrix-addressed CRT flat display, but it has more or less fallen into desuetude. Other matrix-addressed units are the gas-electron-discharge units from Lucitron and Siemens, but it is moot whether these should be considered as CRTs or plasma displays. In addition, there are the electron multiplier version developed by Philips and the discontinued effort by RCA to incorporate shadow-mask technology into a flat structure, but none of these has reached the product stage, and their future is uncertain.

Projecting into the future

There has been an increasing amount of interest in new approaches to projection displays. Of course, the light-valve Eidophor, especially in its latest versions, remains the system of choice for most outdoor installations, and indeed provides a most impressive result. However, GE has recently introduced new versions of the Talaria, based on its innovations in the light valve, and there are those that use liquid-crystal light valves such as the ones from Hughes and Greyhawk among others, so that we may expect improvements to occur in these systems as well.

This is a rather brief summary of what has happened in the field of information display technology over the last 25 years, and I have surely missed many of importance. In addition, there are numerous other contributors whose names have not been included here for reasons of space and memory. I must ask them to forgive me, and I trust I can retain their friendship in spite of this neglect. Meanwhile, my best wishes to SID on its 25th anniversary, and I hope it will be alive and flourishing on its 50th anniversary, although I have no illusions of being around at that time. ■

TWENTY-FIVE YEARS



History of the Society for Information Display

BY ROBERT C. KNEPPER

THE SOCIETY for Information Display (SID) was founded as a result of interest expressed at special courses on "Information Display Systems" coordinated by Dr. Harold R. Luxenberg at UCLA Extension in the summers of 1961 and 1962. Requests to speakers for reprints of papers reinforced the idea of forming a display society.

Beginnings

Dr. Luxenberg agreed to arrange an organizational meeting on September 29, 1962, and 39 people from major high-tech corporations attended [Table 1]. As a result of that first meeting at UCLA's Boelter Hall and a later meeting at USC, SID's first officers and committees were approved [Table 2].

The main business of the September 29 meeting was to establish the need for an independent society. Loren Gardner (who worked for Dr. Luxenberg at Houston Fearless Corp.), Rudolph Kuehn, and Richard Van Tassel spoke on the need for a new and independent display society. A majority enthusiastically supported the idea and approved Mr. Gardner's resolution to found a society. So SID was born.

Several alternative names were considered, including "International Society of Information Display Engineers and Scientists" (IS IDEAS). The group liked the acronym SID but put off formal approval of the name until the Society had a constitution. The minutes show that at-

Robert C. Knepper, SID Historian and Archives Chairman, was involved with SID from the very beginning. He is Senior Scientist at Hughes Aircraft Company in Fullerton, California.

tendees at the organizational meeting each paid \$10 for membership in the new Society for "one year from the time of incorporation." Memberships at \$15 per year were now solicited by letter and in magazine announcements.

Volume I, No. 1, of the *SID Newsletter*, the first SID publication, was issued in January 1963 and included news and a membership solicitation. SID was officially incorporated in the State of California on April 2, 1963.

The first major SID event was the

"First National Symposium on Information Display," held on March 14, 1963, at the Miramar Hotel in Santa Monica, California. The Symposium included a general meeting with the presentation of new and old officers, a keynote address, 14 technical papers, and a panel discussion. The historic affair closed with a banquet and a guest speaker. There were no formal exhibits by manufacturers. The *Symposium Technical Session Proceedings* was made available in June 1963 for both members and non-members.

**Table 1: Attendees at SID Organizational Meeting
September 29, 1962**

Robert W. Asher, <i>Litton</i>	M. C. Langtry, <i>Bendix Computer Div.</i>
Raymond E. Bernberg, <i>RCA</i>	William W. Lindsay, Jr., <i>Lockheed California Co.</i>
Jim Beucher, <i>RCA</i>	R. J. Lintell, <i>Houston Fearless Corp.</i>
George B. Collins, <i>IBM</i>	Richard T. Loewe, <i>Aeronutronic/Ford Motor Co.</i>
Phillip Damon, <i>Hughes Aircraft Co.</i>	Harold R. Luxenberg, <i>Houston Fearless Corp.</i>
R. A. Davidson, <i>Lockheed Missiles & Space Co.</i>	H. C. Martin, <i>Litton</i>
Herbert Deich, <i>Aerojet General</i>	John McGrail, <i>RCA</i>
Robert L. Delsasso, <i>RCA</i>	W. D. Merryfield, <i>Litton</i>
Walter E. Deutsch, <i>RCA</i>	David K. Robbins, <i>Nortronics</i>
Dail D. Doucette, <i>Aerojet General</i>	Louis M. Seeberger, <i>RCA</i>
W. A. Fails, <i>Litton</i>	John L. Stahlke, <i>Sylvania</i>
Michael J. Flanagan, <i>Mitre Corp.</i>	C. Tomaszewski, <i>RCA</i>
Dudley E. Foster, <i>Hazeltine Research Facility</i>	R. E. Turnage, <i>General Dynamics/Electronics</i>
Paul L. Fox, <i>Whittier</i>	Richard D. Van Tassel, <i>Sylvania</i>
Loren Gardner, <i>Houston Fearless Corp.</i>	M. Clark Wager, <i>Tridea Electronics</i>
Daniel J. Griffin, <i>CFL Co.</i>	K. H. Walker, <i>Houston Fearless Corp.</i>
Walter J. Hoffman, <i>IT&T</i>	Purry O. (Woody) Wilson, <i>General Dynamics/Electronics</i>
Robert C. Knepper, <i>Hughes Aircraft Co.</i>	Richard N. Winner, <i>North American Aviation</i>
John Kolostyak, <i>Hughes Aircraft Co.</i>	
Rudolph L. Kuehn, <i>Aeronutronic/Ford Motor Co.</i>	
Michael G. Kunec, <i>Autonetics</i>	

Including those who signed up at the Symposium, SID's paid membership grew to 125—about 75 from the west coast and 50 from the eastern and central U.S. Membership grew rapidly [Fig. 1, p. 16]. Of the charter members of SID, defined at those whose dues were paid prior to incorporation, 23 are still active in SID today.

Just prior to the first Symposium in March 1963, the SID bylaws, which replaced the earlier constitution, were approved on the same ballot as the national officers. Table 3 lists the national officers elected each year between 1962 and 1987.

The SID board of directors now consists of the four elected officers (president, vice-president, treasurer, and secretary), the past president, and one director from each active chapter. Regional representatives from areas not having active chapters plus committee

Table 2: SID's First Officers

President: Harold R. Luxenberg
Vice President: Rudolph L. Kuehn
Secretary: Loren B. Gardner
Treasurer: David K. Robbins

Western Regional Director: Richard Van Tassel
Central Regional Director: Victor M. Bernin
Northeastern Regional Director: Solomon Sherr
Southern Regional Director: Milton Goldin
Members at Large: James H. Howard (Rear Admiral, Retired), Al Tauber, Leo E. Ubry, and George B. Collins

Committee Chairmen:
Constitution: Herbert Deich
Fiscal: David K. Robbins
Membership: Loren B. Gardner
Editorial: Michael Kunec
Ways and Means: Rudolph L. Kuehn
 Committee additions on December 2, 1962, at USC:
Publications and Archives: Dail D. Doucette
Nominations: Walter Hoffman and Solomon Sherr

Table 3: SID National Officers 1962-1987

Year	President	Vice President	Treasurer	Secretary
1962	Harold R. Luxenberg	Rudolph L. Kuehn	David K. Robbins	Loren B. Gardner
1963	Rudolph L. Kuehn	Anthony Debons	David K. Robbins	Herbert Deich
1964	Anthony Debons	Virgil P. Barta	Phillip P. Damon	John F. Martell
1965	James H. Redman	William P. Bethke	Sherman H. Boyd	William V. Taylor
1966	William P. Bethke	Solomon Sherr	Edith Bardain	Carl Machover
1967	William P. Bethke	Petro Vlahos	Fordyce M. Brown	Carl Machover
1968	Carl Machover	Petro Vlahos	Ernst N. Storrs	Carlo P. Crocetti
1969	Carl Machover	Phillip P. Damon	Robert C. Klein	Carlo P. Crocetti
1970	Phillip P. Damon	Carlo P. Crocetti	Louis M. Seeberger	Robert C. Klein
1971	Phillip P. Damon	Carlo P. Crocetti	Erwin A. Ulbrich	Robert C. Klein
1972	Carlo P. Crocetti	Robert C. Klein	Robert C. Knepper	Erwin A. Ulbrich
1973	Carlo P. Crocetti	Robert C. Klein	Bernard J. Lechner	Erwin A. Ulbrich
1974	Robert C. Klein	Erwin A. Ulbrich	Bernard J. Lechner	Thomas V. Curran
1975	Robert C. Klein	Erwin A. Ulbrich	Tarricia A. DuPuis	Bernard J. Lechner
1976	Erwin A. Ulbrich	Bernard J. Lechner	Vernon J. Fowler	Tarricia A. DuPuis
1977	Erwin A. Ulbrich	Bernard J. Lechner	Vernon J. Fowler	Tarricia A. DuPuis
1978	Bernard J. Lechner	Tarricia A. DuPuis	Gus F. Carroll	Vernon J. Fowler
1979	Bernard J. Lechner	Tarricia A. DuPuis	Gus F. Carroll	Vernon J. Fowler
1980	Tarricia A. DuPuis	Vernon J. Fowler	Ifay F. Chang	Gus F. Carroll
1981	Tarricia A. DuPuis	Vernon J. Fowler	Ifay F. Chang	Gus F. Carroll
1982	Gus F. Carroll	Ifay F. Chang	John A. van Raalte	John L. Simonds
1983	Gus F. Carroll	Ifay F. Chang	John A. van Raalte	Lawrence E. Tannas, Jr.
1984	Ifay F. Chang	John A. van Raalte	Lawrence E. Tannas, Jr.	Walter F. Goede
1985	Ifay F. Chang	John A. van Raalte	Lawrence E. Tannas, Jr.	Walter F. Goede
1986	John A. van Raalte	Lawrence E. Tannas, Jr.	Walter F. Goede	Peter Pleshko
1987	John A. van Raalte	Lawrence E. Tannas, Jr.	Walter F. Goede	Peter Pleshko

chairmen and chapter chairman are invited to the semiannual board of directors meetings.

Chapter formation

Local chapter formation was discussed at the September 1962 organizational meeting, and four chapters were in operation in 1963: Los Angeles, San Diego, New York (now Mid-Atlantic), and Washington. All but the last are still active. The first local chapter meeting on record was a meeting of the Washington Chapter in January 1963. Between 1965 and 1967 four more chapters were added: New England, Bay Area, Delaware Valley, and Minneapolis/St. Paul. By now SID membership had grown to near-

ly 1500. Two short-lived chapters, Southwest and Huntsville, were formed in 1968 and 1969 but disbanded in 1973.

The U.K. & Ireland Chapter cosponsored a conference on "Displays for Man/Machine Systems" at the University of Lancaster in April 1977, but that chapter remained dormant until its reorganization in 1985. The Japan Chapter was formed in 1975, followed a year later by the Midwest Chapter. In 1986 the Canadian Chapter was formed, and in January 1987 the newest chapter of all - Dayton - was added. By December 1986, SID membership had reached 2704.

To encourage chapters to have meetings and to solicit new members, SID National pays each chapter for each meeting

reported and for each member and sustaining member in its area.

Symposia

Holding symposia for the presentation and exchange of display information has always been a major activity of SID. Initially, two symposia per year were held, one on the east coast, one on the west, to minimize travel difficulties. The format was changed in 1966 to one symposium per year. Table 4 shows where they have been held each year since the formation of the Society.

Since 1972, SID has been a cosponsor of the annual International Display Research Conferences. SID and SID local chapters have also sponsored or cospon-

Table 4: SID International Symposia

Year	Place	Chairman	Program Chairman	Attendance			Exhibit Booths
				Symposium	Seminar Mon.	Fri.	
1963	Santa Monica, CA	William V. Taylor	Dail Doucette (Publications)	95			
1963	New York, NY	George Collins		266			
1964	San Diego, CA	Samuel B. Fishbein	Rudolph L. Kuehn (Publications)	466			32
1964	Washington, DC	Lewis R. Blair, Jr.	Ernest N. Storrs	?			19
1965	Santa Monica, CA	Raymond E. Bernberg	Erwin A. Ulbrich	?			?
1965	New York, NY	Fordyce M. Brown	Edmund Kennedy	~400			?
1966	Boston, MA	Glenn E. Whitham	Robert C. Shuppert	~500			?
1967	San Francisco, CA	Donald R. Cone	Jan M. Engel	513			19
1968	Los Angeles, CA	Louis M. Seeberger	Erwin A. Ulbrich	?			34
1969	Arlington, VA	Lewis Blair	Halvor T. Darracott	501			?
1970	New York, NY	Solomon Sherr	Bernard J. Lechner	927			?
1971	Philadelphia, PA	Bernard J. Lechner	Thomas E. Bray	473			15
1972	San Francisco, CA	Herbert C. Hendrickson	James H. Becker	597			16
1973	New York, NY	James H. Becker	H. Eugene Slottow	574	69	48	21
1974	San Diego, CA	H. Eugene Slottow	Samuel M. Stone	662	75	62	23
1975	Washington, DC	Joseph Markin	Vernon J. Fowler	481	60	40	22
1976	Los Angeles, CA	William E. Good	John A. van Raalte	465	72	50	22
1977	Boston, MA	Vernon J. Fowler	John B. Flannery	550	59	45	22
1978	San Francisco, CA	John A. van Raalte	John L. Simonds	567	147	106	25
1979	Chicago, IL	John B. Flannery	Philip M. Heyman	503	126	89	25
1980	San Diego, CA	John L. Simonds	Ifay F. Chang	803	266	184	36
1981	New York, NY	Philip M. Heyman	Andras I. Lakatos	632	158	143	33
1982	San Diego, CA	Ifay F. Chang	Walter F. Goede	854	268	257	42
1983	Philadelphia, PA	Andras I. Lakatos	James N. Price	824	310	256	45
1984	San Francisco, CA	Walter F. Goede	Thomas L. Credelle	1069	484	453	60
1985	Orlando, FL	James N. Price	Aris K. Silzars	984	475	370	84
1986	San Diego, CA	Thomas L. Credelle	Allan R. Kmetz	1088	410	436	99
1987	New Orleans, LA	Aris K. Silzars	Lee T. Todd, Jr.				

sored various local and specialized symposia. The printed symposia proceedings form a very important source and repository of the advances in display technology.

Early symposia were organized and arranged by the local chapter with help from SID National. The symposia grew too large for this arrangement, and year-to-year continuity was desired. So since 1970 professional help has been used. From 1970 to 1984, Lew Winner, helped until her death by his wife Beatrice, was the symposium and exhibit manager and coordinated the printing of the Symposium *Digest*. Starting in 1978, Palisades Institute for Research Services, Inc. in New York City was hired as symposium manager, using Mr. Winner as a consultant. In 1985, Palisades took over full responsibility for the symposium and exhibits.

Display tutorials held during the symposium week were cosponsored by SID and various convention-area universities from 1973 to 1979. Since 1980 these seminars have been operated by SID.

Awards

A privilege of a professional society is honoring distinguished accomplishments and service to the society. The SID awards include:

1. *Frances Rice Darne Memorial Award*
to a SID member for outstanding technical achievement.
2. *Beatrice Winner Award*
to a SID member for exceptional and sustained service to SID.
3. *Johann Gutenberg Prize*
to a SID member for achievements in hardcopy technology. This prize is sponsored by IBM Corp. and includes a \$2000 cash award.
4. *Karl Ferdinand Braun Prize*
named after the inventor of the CRT (1897), this prize is given to a SID member for outstanding achievement in display technology. It is sponsored by RCA and includes a \$2000 cash award.
5. *Fellow Award*
to a SID member for widely recognized significant contributions to the field of information display.
6. *Special Recognition Award*
to a member or non-member for distinguished and valued contributions to the field of information display.

Table 5: SID Awards

Frances Rice Darne Memorial Award

1971	Bernard J. Lechner	1979	Sam H. Kaplan
1973	H. Eugene Slottow	1980	James C. Greeson, Jr.
1974	Norman H. Lehrer	1981	Jan A. Rajchman
1975	Harold B. Law	1984	George E. Holz
1976	Cecil E. Land	1984	James A. Ogle
1977	Vernon J. Fowler	1985	Peter Pleshko
1978	Irving Reingold	1986	James L. Ferguson

Beatrice Winner Award

1983	Bernard J. Lechner	1985	Solomon Sherr
1984	Lewis Winner	1987	Harold R. Luxenberg

Karl Ferdinand Braun Prize

1987 T. Peter Brody

Johann Gutenberg Prize

1987 Gary K. Starkweather

Fellows

1963	Ruth M. Davis	1975	H. Eugene Slottow
1963	James H. Howard	1976	Sanai Mito
1964	Anthony Debons	1976	Dalton Pritchard
1965	Rudolph L. Kuehn	1976	Gerald K. Slocum
1966	Edith Bardain	1977	Thomas C. Maloney
1966	William P. Bethke	1977	Koh-Ichi Miyaji
1966	Carlo P. Crocetti	1977	William H. Ninke
1966	Frances R. Darne	1977	John A. van Raalte
1966	Harold R. Luxenberg	1978	Ifay F. Chang
1966	Petro Vlahos	1978	Gentarō Miyazaki
1967	William R. Aiken	1978	Peter Pleshko
1967	Sid Deutsch	1979	Aron Vecht
1967	George Dorion	1980	Cecil E. Land
1967	Solomon Sherr	1980	Masanobu Wada
1968	Fordyce M. Brown	1981	Frederick J. Kahn
1968	Robert C. Carpenter	1981	Elliott Schlam
1968	Phillip P. Damon	1981	Alan Sobel
1969	James H. Redman	1982	Jay J. Brandinger
1969	Carl Machover	1982	Peter D. T. Ngo
1969	Louis M. Seeberger	1983	Yoshifumi Amano
1970	Leo Beiser	1983	T. Peter Brody
1970	N. J. Koda	1983	Webster E. Howard
1970	Bernard J. Lechner	1983	Lawrence E. Tannas, Jr.
1970	Harry H. Poole	1984	Thomas L. Credelle
1971	Benjamin Kazan	1984	Werner E. Haas
1971	Harold B. Law	1984	P. Andrew Penz
1972	Pierce W. Siglin	1985	C. J. Gerritsma
1973	Irving Reingold	1985	Allan R. Kmetz
1974	Vernon J. Fowler	1986	Tomio Wada
1974	Charles P. Halstead	1986	Paul M. Alt
1974	Edwin H. Hilborn	1986	Roger L. Johnson
1974	George Holtz	1987	Omesh Sahni
1974	Albert Loshin	1987	Andras I. Lakatos
1975	Lucien M. Biberman	1987	Shunsuke Kobayashi
1975	William E. Good		

The Johann Gutenberg Prize and the Karl Ferdinand Braun Prize will be awarded for the first time in 1987. Together they will take the place of the Frances Rice Darne Award.

The SID awards and recipients to date are shown in Table 5.

Publications

To many members, publications are SID's most important activity. Following the organizational meeting in 1962, the *SID Newsletter* first appeared in January 1963. In July of that year, the name was changed to *SID Readout* and five issues followed. *Information Display* was first published in October 1964. Today *ID* has a circulation of nearly 11,000.

The *SID Symposium Proceedings*, issued after each Symposium and equivalent to today's *SID Digest*, were the primary technical publications until the (usually) quarterly *Proceedings of the SID* began in 1969. Under the editorship of Sol Sherr, the *Proceedings* publishes refereed scholarly articles four times a year, usually devoting one issue a year to extended versions of symposium papers.

Not counting joint SID-IEEE publications, SID has published more than 2400 technical articles in its 25-year history.

Sustaining members

The support of sustaining (or corporate) members has helped SID throughout its history. Houston Fearless Corp., where Dr. Luxenberg was vice-president and director of engineering, was never an official sustaining member but provided valuable services for the initial SID organizational meeting and for the first Symposium. The first sustaining member was General Dynamics-Electronics in August 1963. The number of sustaining members has grown impressively to its present 113.

Coming of Age

In 1967, SID became an affiliate member of the American Federation of Information Processing Societies (AFIPS), and in 1978 it became a member society. AFIPS provides coordination between the 240,000 members of its societies, which include the Computer Society of the IEEE, the Association for Computing Machinery, and nine additional societies. AFIPS provides society representation to the U.S. Government, the United Nations, and various international governments and standards organizations. To

Table 5: SID Awards (Continued)

Special Recognition Awards

1972	Malcolm L. Ritchie	1979	Donald L. Bitzer
1972	Solomon Sherr	1979	Tony N. Criscimagna
1974	William E. Good	1979	Tadashi Nakamura
1974	Herbert C. Hendrickson	1979	Peter D. T. Ngo
1974	Kenichi Owaki	1980	Paul M. Alt
1974	Ivan Sutherland	1980	Philip M. Heyman
1974	Andries van Dam	1981	William B. Pennebaker
1975	Joseph E. Bryden	1982	Larry F. Weber
1975	George H. Heilmeier	1983	Toshio Inoguchi
1975	Peter Seats	1983	Henry Marcy
1975	Otto H. Schade, Sr.	1983	Chuji Suzuki
1975	Donald A. Shurtleff	1983	Omesh Sahn
1976	T. Peter Brody	1984	Koichiro Kurahashi
1976	Joseph Markin	1986	Masakazu Fukushima
1976	Albert Rose	1986	Eiichi Yamazaki
1976	Aron Vecht	1987	Dwight Berreman
1977	Gerald Marie	1987	Eiji Kaneko
1977	Solomon Sherr	1987	Jurgen Nehring
1977	Beatrice & Lewis Winner	1987	Peter Raynes
1978	Leo Beiser	1987	Martin Schadt
1978	C. J. Gerritsma	1987	Terry Scheffer
1978	Benjamin Kazan		

many, AFIPS is best known for its sponsorship of the National Computer Conferences and other conferences.

SID now has 15 different committees at the national level, performing many valuable functions for the Society. A list of these committees vividly illustrates how SID has grown and the wide variety of its activities: Academic; Archives; Bylaws; Chapter Formation; Conferences—Sym-

posium and IDRC; Definitions and Standards; Honors and Awards; Inter-society; Membership; Publications; Publicity; and Special Technologies—Workstations and Hard Copy.

This brief history is based on the best available data, although some of the records are incomplete. If you have additional data, corrections, and clarifications, please let the author know. ■

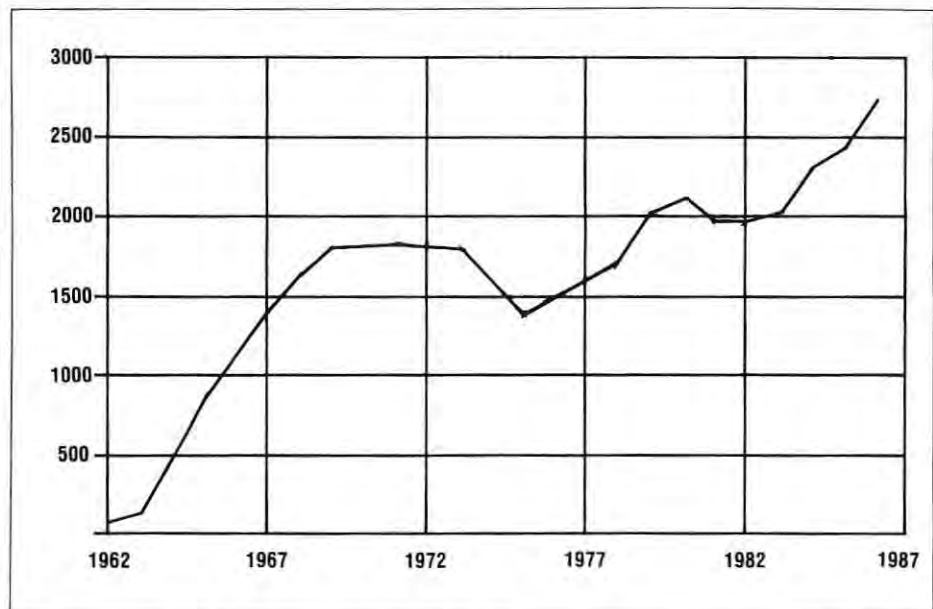


Fig. 1. SID membership has grown to nearly 3000. Includes regular, fellow, life, associate, and student members and sustaining member designees.

Are we where we should be?

interviews with display industry leaders—part one

TO CELEBRATE the 25th anniversary of the Society for Information Display, we asked 25 leaders of the display community these four questions:

1. What was the single most important event in SID's history and how has this affected the Society and the display industry?
2. What was the most important event to the display industry in the last 25 years, and who has been the single most significant person?
3. What is the single most important event or development you expect to see in the display industry in the next five years?
4. What is SID's biggest problem today?

Not all of our interviewees answered every part of every question but they all made valiant efforts, especially since the questions were intended to put them on the spot. We have shortened some answers substantially, but have done our best to retain not only the main points of the interviewees' answers, but also their personalities.

To allow adequate room for the other features in this issue, we are only publishing the responses of the first 13 interviewees this month. The remainder will appear in May.



Thomas L. Credelle
Manager, Display Program
General Electric Co.
Schenectady, NY

1. The creation of the international display Symposium, which provides a central yearly meeting place for display experts from around the world and a showcase for all types of display research. This has generated a cohesiveness that has really aided the development of displays.

2. The development of VLSI and very inexpensive memory have allowed for the development of inexpensive flat-panel displays and have also led to many new

products that need better displays. Though really not a display development, I think it has affected our industry more than anything else.

3. The end of the CRT as the dominant display vehicle. There's going to be a real proliferation of flat-panel displays in everything from home entertainment to airplane cockpits.

4. We have strength in our diversity, but also weakness. We're still a relatively small society, and as we try to cover a breadth of materials, maintaining a central focus is sometimes difficult. It used to be the CRT; now it's CRTs, flat panels, printers, and human factors. As a group, we have to identify those areas that are growing and have synergism with existing technologies so we can contribute new input.



Tarricia DuPuis
Program Manager
Advanced Avionics
Programs
Hughes Aircraft Co.
El Segundo, CA
Past President, SID

1. The strength of the Society is that there is no single event or single person that shaped SID. It was the contribution of many people volunteering their time and energy over many years that is responsible for SID's success.

2. The development of flat-panel liquid-crystal devices capable of displaying TV video, and the mass production of these devices with good reliability and long lifetimes.

3. Growing concern over the health effects of spending long hours in front of a computer terminal: there will be increasing efforts to reduce ionization levels and ameliorate eye fatigue. Emphasis will shift from "user friendly" to "user healthy."

4. Expanding the focus of our activities from, primarily, display media to system-level integration—the coordination of multiple data sources and sensing devices

"There's going to be a real proliferation of flat-panel displays in everything from home entertainment to airplane cockpits."

—Thomas L. Credelle

"We missed a tremendous opportunity to get into the graphics area. SID could have been where SIGGRAPH is today."
—Howard L. Funk

into an integrated whole with the display and its processor as the primary interface between man and system.



Howard L. Funk
Program Director
IBM Corp.
Thornwood, NY

1. The founding—the very fact that we exist as a uniquely display-oriented society. There is no other society that does precisely what we do. We have maintained our uniqueness, and the credit goes to the founding fathers.

2. Let me go back just a little further. The ubiquitous display technology which has been with us since 1950, the color CRT, has shown enormous staying power and continuous evolution. It is this technology and the enormous volumes provided by the television industry that has made color displays for computer terminals economically feasible.

Credit for the leadership and foresight to support the development of color television and the related technologies must go to David Sarnoff.

3. Color LCDs.

4. SID has to be more aggressive in going after new areas in display-related fields, such as hard copy, which we've already done to an extent. We need to expand our membership and move into other areas like image processing, I/O, graphics. We missed a tremendous opportunity to get into the graphics area. We could have been where SIGGRAPH is today, with a conference attendance of 25,000. It was a lost opportunity for expansion.



Frederick Kahn
Vice President
Physical Technology
Greyhawk Systems, Inc.
Milpitas, CA

1. The SID International Symposium and the International Display Research Conference. They occur every year. The most important thing to the display industry and to the Society is to maintain the free flow and international exchange

of ideas. This exchange promotes invention, commercialization, and more importantly, international understanding.

2. The invention of the microprocessor by Marcian Hoff of Intel. Though not a display device, the microprocessor has driven and created the need for displays in a wide range of applications requiring programmability or local intelligence.

3. The commercialization of high-definition television will drive the development and proliferation of a new generation of very-high-resolution and very-large-area displays. We will be able to see and process more information, more effectively and more naturally, both at work and at play.

4. Change. There are many changes going on in the display industry and in the world, and SID has to be able to modify itself to accommodate these changes. One of these changes is the internationalization of industry and technology. For SID to continue to be a true international society, it must bring together the key workers from all over the world.



Christopher N. King
Vice President
Planar Systems, Inc.
Beaverton, OR

1. The growth of non-television applications for displays in fields such as avionics, computer graphics, and personal computers. The performance requirements of these new applications has stimulated the display engineering community to develop an amazing diversity of new display technologies ranging from stadium-size screens to pocket-size color televisions. This has fueled the growth both of the Society and the display industry.

2. Commercialization of flat-panel display technologies, which has stimulated the broad interdisciplinary development which is a unique characteristic of the display technology field.

Dr. Toshio Inoguchi, for the presentation at the 1974 SID Symposium of the results of his Sharp Electronics Research Group that demonstrated the technical merits and commercial prospects for flat-panel EL display devices. Dr. Inoguchi's work not only stimulated an international effort to successfully develop EL display technology, but also struck a resonant

chord with researchers in many other flat-panel display technologies at a time when the display industry was so dominated by CRT technology that it needed injections of new ideas.

3. Commercialization of a large-area full-color flat-panel display technology.

4. Relative decline of the U.S. display industry versus the Japanese display industry. This is tending to make the International Display Research Conference, especially the meeting in Japan, take on relatively more significance.



Shunsuke Kobayashi
Tokyo University of
Agriculture and Technology
Tokyo, Japan

2. The development of color television and its penetration into society, which was initiated by Harold Law at RCA. Next would be liquid-crystal technology and George Heilmeyer's work at RCA in the late '60s.

3. The penetration of high-definition television into society.

4. Reducing the gap between display hardware and human factors.



Bernard J. Lechner
Consultant
Princeton, NJ
Past President, SID

1. Restructuring the annual SID Symposium so that it was run by the national organization rather than the local chapters. This permitted continuity in the organization and management of the Symposium, and the creation of a large on-going program committee that could actively solicit, review, and select the papers that are presented at the Symposium each year. As a result, the SID Symposium has become *the* internationally recognized forum for new developments in the display industry.

2. Not one single development or one single person, but a collection of many developments by many people relating to the application of liquid-crystal technology to display devices.

3. The development of a true flat-panel color display device that meets the requirements of consumer television. That's been a goal of this industry for over 30 years and I would like to see it happen in the next five years, but I'm not predicting that it will.

4. Membership. The Society is very healthy and has a strong and loyal membership, but when you compare the size of the industry with the size of the membership, it's clear that there are a lot of people who are freeloading. They participate in the field and doubtless read our publications, but fail to become members and support the Society. When you think of what our annual dues are and the value that members receive from those dues, it's hard to understand why more of the people in our industry have not joined the Society.



Harold R. Luxenberg
Professor Emeritus
California State University
Chico, CA
Past President, SID

1. The fact of its organization.
2. The rapid emergence of liquid-crystal displays and the development of them into practical display devices.

3. Hopefully, the flat-panel high-resolution color display element—or device—to replace the CRT.

4. That display systems engineering is not an independent technology. It's interdisciplinary. The big problem is making the existence of SID known to people in some of the disciplines that are important to information display.



Carl Machover
President
Machover Corp.
White Plains, NY
Past President, SID

1. The establishment of national meetings with technical papers and exhibitions which effectively created a forum for display activities. In addition to providing a place where experts could exchange information, it allowed users to understand what was becoming available that they could incorporate into their ap-

“The personal computer has expanded the display market by orders of magnitude and brought it into the consumer realm.”

—Carl Machover

“The CRT is the driving force behind the entire industry; either you are trying to develop it further, or you’re chasing after it and its capabilities.”

—Gerald M. Murch

plications. Coupled with the meetings is the proceedings, which has become one of the standard reference sources of the display industry.

2. The personal computer. It has expanded the display market by orders of magnitude and has brought it into the consumer realm. The result is a very sophisticated user community, which places higher and higher demands on applications using displays. The big names that come out of that are Steven Jobs and Steve Wosniak, the co-founders of Apple Computers.

3. Desktop systems that have realistic real-time image capability not unlike our present-day flight simulators.

4. The lack of attention paid to software. SID is so device oriented that it has lost sight in many cases of the environments in which the devices are used. If you look at industry statistics you will find that the cost of hardware is going down and down, and software contributions are going up and up. Unless the Society takes a much more aggressive position in the software environment, it’s going to find itself with severe problems.



Paul Malmberg
Manager
Design Engineering
Litton Panelvision
Pittsburgh, PA

2. The seminal work on liquid-crystal active-matrix flat-panel displays is the most significant development in the last 25 years of display history, so the first SID paper describing these displays is the Society’s most important single event.

Dr. T. Peter Brody, because of his pioneering work in active-matrix flat-panel displays.

3. The use of active-matrix circuitry on the periphery of large displays to do all the driving and perhaps the logic memory work as well. I expect these displays to grow rather large—up to maybe 20 or 25 in. in diagonal.

4. Drawing together display interests around the world. The U.S. and the Far East are well represented, as well as honored, today, but scientific work in Europe, Russia, the Near East, India, and the continents of Africa and South America is not yet properly represented.



Gerald M. Murch
Chief Scientist
Tektronix, Inc.
Beaverton, OR

1. That SID has had a 25-year history, that it continues to grow, and continues to play a unique and crucial role in high technology. Twenty-five years ago it was not clear that an organization could be formed that would successfully bring together all the different sub-disciplines that were involved in display technology. But SID’s success is clear. Many corporations, universities, and other organizations regard SID as the premier forum for announcing new advances in display technology, and subjecting those advances to the probing, practical questions of a professional audience.

2. The explosion of computer technology. The magnificent operations computers perform must be communicated to human beings, usually in the form of a visual event. So displays have blossomed as the primary means of translating those computer bits into a form humans can understand.

Sol Sherr and Harry Snyder. Sol, a great educator, is able to distill the knowledge of each of the sub-disciplines that make up SID, and transmit it in a way that can be understood by all of them. This is very important since one of SID’s primary functions is to be an educational forum. Harry, whose background is in human factors, has the ability to describe the needs of the human visual system to display technologists, so they know what to design.

3. The truth of the standard joke that the lifetime of the cathode ray tube is another five years, and it doesn’t matter when you say it. If the cathode ray tube had *not* been invented yet, and someone were to present a paper at SID ’87, it would be the most significant paper to be given in the last 25 years. The CRT is the driving force behind the entire industry; either you are trying to develop it further, or you’re chasing after it and its capabilities.

4. The danger of becoming an old boy’s club. Not that the good old boys aren’t pretty good, but we must get some fresh young faces involved—people who have different ideas. For example, one of the issues we’ve wrestled with for a long time is how involved SID should get in soft-

ware issues. But the next generation that's coming along doesn't even make the distinction between hardware and software that our generation does. To them, it's all part of a system. And we need to get some people involved who think that way. As part of this, we must do more to further the university programs. We want people who are coming from the universities to recognize that SID is in fact a forum they should be participating in.



Lawrence E. Tannas, Jr.
President
Tannas Electronics
Orange, CA
Vice President, SID

1. Going it alone outside larger electrical engineering organizations. This has allowed SID to concentrate on a very important electronic component, the display, which doesn't really fit in any IEEE or human factors or SPIE or EIAA organization, but is, on the other hand, important to all of them. The key reason is because display technology is so multidisciplinary. It involves material sciences, physics, chemistry, human factors, as well as electrical engineering.

2. Not a single event, but a wave of them. That wave is the evolutionary development of large high-resolution color CRT video displays. And there is no one person responsible. It's an industry event, not only from materials and engineering standpoints, but from applications and systems standpoints.

3. A 10-in.-diagonal color liquid-crystal television that you can hang on the wall and fly in an airplane.

4. Growth; growing out beyond being a components-oriented society and bringing in more systems applications and other disciplines, and making them a stronger part of our membership and our conferences. We need to build from our strong base of display and printer components, grow into related components such as sensors and memories, and expand more extensively into information-based systems.



John A. van Raalte
Director
Display Systems Research
David Sarnoff Research
Center, Inc.
Princeton, NJ
President, SID

1. The 1970 "IDEA" Symposium, which became the model for all the International Symposia that followed and which established them as the premier annual information display conference in the world. The SID Symposia have done more to bring together the international information display community than any other SID-sponsored activity. As a result SID is known world-wide, our international membership has grown significantly, and SID has a reputation for presenting the latest and most exciting developments at its conferences.

2. I was, at first, inclined to mention the development of certain new flat-panel technologies. But I believe advances in hard-copy technologies will have a far greater impact on our Society and the display industry.

George Heilmeyer, because he has been mostly responsible for the renewed interest in liquid-crystal displays. He started his work in the mid-'60s at RCA.

3. The information explosion, which is driven by new developments and the rapidly declining costs in IC technology, communications, data storage, display devices and hard-copy technologies, will continue and, in about five years, will produce a tremendous increase in electronic communications and data processing/display in the home as well as the office.

4. That SID must change with the times. Years ago we used to place our greatest emphasis on display phenomena, physics, and novel devices. Since then our Society has expanded into new areas—systems, human factors, and hard copy, for example. We have not been totally successful in our attempts to establish ourselves in the areas of software development, workstations, image processing, data storage technologies, and others. SID must continue to change and expand if it is to remain vital. ■

"SID must continue to change and expand if it is to remain vital."

—John A. van Raalte

Lew Winner and SID

BY THE EDITORIAL STAFF

LEW WINNER is a memorable and emotional man, and the two qualities are inseparable. He speaks freely of the pains and satisfactions gained in his long career, and the emotions arising from his memories play across his face. He doesn't hesitate to discuss the frustrations he has experienced, some of which stem from his past association with the Society for Information Display.

In 1970, Lew was asked by Bernie Lechner, then National Symposium Committee Chairman, to run SID's annual technical Symposium and to edit the Symposium *Digest*, starting with the 1971 meeting in Philadelphia. This was to be done following the model Lew had created for the Institute of Electrical and Electronics Engineers' International Solid State Circuits Conference (ISSCC), which was already a highly successful meeting and has since become one of the most successful of technical conferences. SID's Symposium has also prospered, and Lew was invaluable in setting up the meeting for which the Society as a whole is known worldwide.

Lew and Beatrice

Over the years, Lew and his wife Beatrice became fixtures at SID Symposia. Lew, crusty and opinionated, secure in his convictions about how the Symposium should be run and the *Digest* edited, orchestrated these activities with an authoritarian flair and strong feelings about what he thought was right. Bea was his constant helpmate. As a team, they ran it all, from the smallest detail through the vital tasks a successful meeting requires, performing throughout with tremendous energy,

especially when the work piled up. Lew also recognized the value of publications, digests, and tutorials. He did an incredible amount of work and was meticulously honest.

Lew's strongest point was his passion for quality in the program, especially the *Digest of Technical Papers* for the Symposium. He is a relentless editor, and the efforts he devoted to that task, although at times disconcerting to authors, are reflected in the overall quality of the output. He also insisted on high quality and consistency in the graphics used. Ever the innovator, each year he tried something new and creative to try to make the *Digest* better, and in so doing he has left an indelible stamp.

But by 1984, Lew had withdrawn from SID activities, frustrated by the increasing

restrictions placed on his handling of the Symposium and *Digest*. Since then, he has devoted himself to ISSCC and has enjoyed ever-increasing success there.

A close-knit family

In 1976, Bea Winner died after a lengthy illness, but in any conversation with Lew, she is a participant. It is never long before a point is made with an anecdote involving her, or support marshalled for an argument by Lew's recalling advice that "Mama" once gave him. Others recall what a delightful, lovely person she was, dedicated to Lew and always with a kind word for others and a smile on her face. In addition to their remarkable working relationship, they were a very fond couple, each looking out for the other's comfort and that of their son, who must still



Lew Winner and friends.

cope with the effects of a bout with polio.

In 1982 SID established the Beatrice Winner Award for distinguished service to the Society. Bernie Lechner was the first recipient in the spring of 1983 (see inset), followed in 1984 by Lew—over his strong objections.

Lew and his wife Beatrice became fixtures at the SID Symposia. As a team, they ran it all, performing throughout with tremendous energy.

A critical view

In this month that marks the 25th anniversary of SID, there is a general mood of self-congratulation within our Society, but Lew sees things differently. "I'm embittered," he told *Information Display* recently, "SID leadership has missed an opportunity, has not been as aggressive as it could have been. Twenty-five years and only 2500 members is not success to me."

He went on to say that information display is an inherently exciting field with broad applications and that many non-members attend the spring meeting for the exhibits. He feels that with proper promotion and management, SID should have no trouble attracting 5000 members. With a membership base of that size, SID could embark on an ascending spiral of professional service, influence, and further growth. (Editor's note: The circulation of *Information Display* is approximately four times the size of the Society's membership.)

Even with his frustrations, Lew has not completely severed his relationship with SID. He still reads our magazine and he keeps up with what is happening in the Society. He is a member of the board of directors of Palisades Institute for Research Services, Inc., the publisher of *Information Display* and organizer of SID's annual Symposium, Seminar, and Exhibition. In his conversations with *ID*'s editors, he even surprised himself with some not totally negative recollections of his relationship with SID. ■

Remarks by Bernard J. Lechner on Accepting the Beatrice Winner Award at SID '83

I am deeply honored to have been selected as the first recipient of the Beatrice Winner Award. To those responsible, my sincere thanks.

I am very proud to be a member of the Society for Information Display and I am proud of what the Society has accomplished over the past 20 years—especially this Symposium which has become *the* international forum for the display industry. A large number of dedicated people have made that possible and I am pleased to have been a part of the process.

But the Beatrice Winner Award has a very special deeper meaning to me that goes beyond its recognition of my service to the Society. Because I knew Beatrice personally, I shall also cherish the award for the memories of her that it will bring back.

Twelve years ago, right here in Philadelphia at SID '71, I was honored by the Society as the first recipient of the Frances Rice Darne Award. I also knew Frances and I cherish that award too. But there is something else special to me about the 1971 Symposium. It was the first year that Lew Winner was associated with the Society. The little man in the blue suit was flitting all over the Sheraton Hotel, just a few miles from here in downtown Philadelphia, and he's been behind the scenes at the SID Symposia ever since. His true professionalism is reflected in all aspects of this annual event. The *Advance Program*, the *Digest*, the exhibits, the audio-visuals, the arrangements, everything that is required to make this meeting come together.

And, until her untimely death in the fall of 1976, his wife Beatrice was at his side night and day, whenever and wherever. At the office in New York, at the committee meetings, at the symposia and conferences Lew was associated with. She too was a true professional, meticulously checking that all the t's were crossed and all the i's were dotted. Lew and Beatrice were helpmates to each other in the truest sense of the word.

I last saw Beatrice in February of 1976 when after a gruelling week at the Solid State Circuits Conference she and Lew flew from Philadelphia to Boston early on a Saturday morning to meet me and resolve a hotel problem for SID '77. The hotel we had booked had just closed. She could have gone home to New York and rested. But no, although already suffering from her terminal illness, she remained at Lew's side. Later that spring her illness prevented her from accompanying Lew to Los Angeles for SID '76. But back in New York she continued to answer the phone and pound the typewriter.

Lew always referred to his beloved wife as Mama. I knew her first as Mrs. Winner, then as Beatrice, occasionally the simple Bea. But I think that from now on, with your permission, Lew, I too shall think of her as Mama. This award will help me to remember her as the wonderful person she was.

I thank the Society for what to me is a very special and great honor.

have you read . . . ?

Compiled by HOWARD L. FUNK
IBM CORP.

"Laptops to Gain Speed, Storage, Legibility in '87," Lisa L. Spiegelman, *InfoWorld*, Vol. 9, No. 3 (January 19, 1987), p. 11.

"Quality of Monitor Affects Productivity, Comfort of Workers," Walt Rowinsky, *PC Week*, Vol. 4, No. 1 (January 6, 1987), p. 99.

"Advocates and Scientists Disagree about Hazards of CRT-based Displays," Walt Rowinsky, *PC Week*, Vol. 4, No. 1 (January 6, 1987), p. 99.

"Flat-Panel Displays May Pose Less Health Concern than CRT Technology Has," Steve Rosenthal, *PC Week*, Vol. 4, No. 1 (January 6, 1987), p. 66.

"Color Display Tube for Engineering Workstation: A Technical Tour de Force," Tadanori Okada, *Journal of Electronic Eng*, Vol. 23, No. 237 (September 1986), pp. 53-55.

"Anisotropic Fluorophors for Liquid Crystal Displays," R. L. Van Wyk et al., *Displays*, Vol. 7, No. 4 (October 1986), pp. 155-160.

"Computation of Unique Optimal Ambients and Optimal Contrast Sets of Colours for Cathode Ray Tubes," W. De Corte, *Displays*, Vol. 7, No. 4 (October 1986), pp. 171-178.

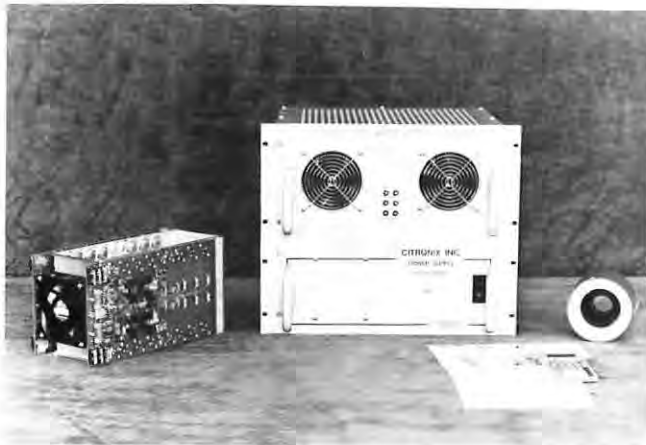
"Next-Generation LCDs Abound with Options," Jack Confrey, *Electronic Products*, Vol. 29, No. 11 (November 3, 1986), pp. 85-88.

"Electroluminescence of Europium Ion-implanted Aluminum During Anodization," Masakazu Katsuno et al., *Jpn J Appl Phys Part 1*, Vol. 25, No. 8 (August 1986), pp. 1262-1263.

"Custom VLSI Circuits for Series 300 Graphics," James A. Brokish, David J. Hodge, and Richard E. Warner, *Hewlett Packard J*, Vol. 37, No. 9 (September 1986), pp. 17-22.

Of special interest: "Liquid Crystal Light Valves Display Large Plots in Real Time," D. Stepner and F. J. Kahn, *Computer Technology Review* (Fall 1986) pp. 143-147. For further information about this technology be sure to attend the SID 1987 International Symposium and Seminar. Dr. Kahn will present a paper on this topic at the Display Systems Session on Wednesday, May 13. ■

DEFLECTION AMPLIFIERS FOR PRECISE CRT BEAM CONTROL



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Applications Engineer

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Multisync touch monitor

MicroTouch Systems announces Multisync Touch, the industry's first multisync touch monitor. This new monitor employs the NEC Multisync monitor integrated with the MicroTouch Screen™, the company's proprietary analog capacitive touch screen. Multisync Touch is specifically designed to support a wide variety of graphics cards, including IBM's EGA, CGA, and PGA, and most new color graphics boards from other vendors.



The integrated Multisync Touch monitor has a 0.31 dot pitch and can display up to 64 colors, with a resolution of up to 800 (H) × 560 (V) pixels. It can be used with the 640 × 200 IBM Color Graphics Adapter, the 640 × 350 IBM Enhanced Graphics Adapter, and the 640 × 480 IBM Professional Graphics Adapter. This 14-in. monitor works with graphic boards having scanning frequencies from 15.75 to 35 kHz, which includes most standard color graphics boards currently available, and has switch selectable analog RGB or TTL inputs.

The MicroTouch Screen features a durable solid glass sensor with a conductive coating bonded to its surface. It provides a high level of optical clarity which is particularly well suited to work with new higher resolution systems. The screen's high definition allows interaction with more detailed graphics images. The new Multisync Touch Monitor is available

immediately for \$1795 in single quantities. OEM quantity pricing is available.

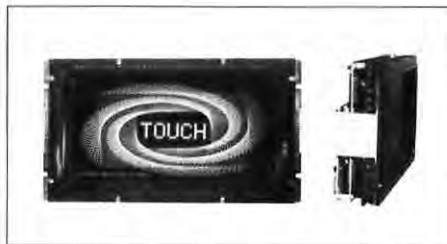
For further information contact Fran Bernstein, MicroTouch Systems, Inc., 10 State St., Woburn, MA 01801. 617/935-0080

Circle no. 7

Sealed IR touch-screen EL display module

Digital Electronics Corporation (DeeCO) has released the SealTouch™ flat-panel IR touch display module. Named "SealTouch" for its one piece molded IR sealed bezel and filter assembly, this new product provides a solution to the common problem of preventing moisture and dust from contaminating the IR touch sensor array.

This new IR touch entry panel is specifically designed for 512 × 256 dot-matrix EL displays and DeeCO's second-generation graphic and text controller. The M3EL512X256 EL module incorporates the patented SealTouch mechanical design and new expanded touch software features such as "pop-up" menus, enter, exit, and track/touch modes, automatic button draw, button pages, callable on-screen keyboards, smooth scroll, and a command set including 68 graphic primitives. The SealTouch array logic is internally interfaced to the DeeCO graphics and text controller. Host interfaces are available in high-speed serial and/or parallel configurations.



The SealTouch display subsystem measures 10.278 (W) × 5.078 (H) × 2.50 (D) in., providing the smallest footprint available. Only +5 and +12 V_{dc} are required. The M3EL512X256 EL module, with SealTouch, is available now for \$3345. Delivery is 30 days ARO.

For further information contact Brian Frey, Digital Electronics Corp., 26142 Eden Landing Rd., Hayward, CA 94545. 415/786-0520.

Circle no. 8

Disturbance waveform analyzer uses touch screen

A new ac power waveform analyzer available from Dranetz Technologies, Inc. is capable of monitoring and analyzing power-line disturbances for up to a month, storing the data in non-volatile memory, and displaying it on a built-in CRT. A touch screen and on-line help routines make the Dranetz Series 656 easy to operate. Commands are given or help requested by touching the appropriate part of the screen. A zoom feature, operated by touch, allows close examination of waveforms. The operator uses a finger to move the zoom to the area of interest and enlarge it to full screen. Time and voltage scales change accordingly. The zoom function may be repeated again and again to obtain high magnifications of disturbance waveforms.



Power-line voltages are monitored in a manner similar to a storage scope with programmable trigger thresholds. Measurements are made on single cycle with "true RMS" computation. When a preset parameter is crossed, the total picture is recorded and labeled with a unique event number. Events are analyzed for the nature of the disturbance, with alphanumeric information attached describing the content—impulse, dropout, sag, surge, and line frequency. Parameters such as amplitude, duration, sine wave position, and time and site of occurrence are also recorded.

new products

In addition to storing waveform data in memory and displaying it on a screen, hard-copy printouts can be made, again by a finger touch, via a built-in printer. The standard instrument is supplied with four independent ac/dc channels, user programmable to measure ac, dc, or neutral-to-ground voltages. An optional eight-channel input accepts external transducer signals for monitoring temperature, humidity, RFI, or other environmental or industrial process parameters. The Series 656 Waveform Disturbance Analyzer is priced at \$9750 with delivery 30 days ARO.

For further information contact James J. Toy, Manager of Corporate Communications, Dranetz Technologies, Inc., P.O. Box 4019, Edison, NJ 08818-4019. 201/287-3680.

Circle no. 9

Multi-application color monitor

Mitsubishi Electronics America, Inc. has introduced a new multi-application color monitor that is fully compatible with the IBM® MDA/CGA/EGA/PGC and Monochrome Hercules graphics boards.



The new Diamond Scan monitor, designated as model AUM-1371A, has unique scanning circuitry which automatically locks onto any horizontal frequency from 15.6 to 35.0 kHz, and any vertical frequency from 45 to 75 Hz. The Diamond Scan is designed for a wide range of applications, including personal computers, NC machines, medical equipment, home automation, sophisticated CAD systems, and NTSC (TV).

In its CGA-compatible mode, the new 13-in. viewable color monitor has a resolution of 330 × 550; for EGA the resolution is 640 × 350; and in PCG operation its resolution is 640 × 480. The Diamond Scan monitor can receive an NTSC video signal for the video overlay feature. Other key features include a 0.31 dot pitch, in-line gun with multistep focus, low power consumption, super-high-contrast panel glass, and glare-

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Circle no. 10

reduction diamond matte coating. The Diamond Scan, measuring 14½ (W) × 15 (D) × 12½ (H) in., comes in an ergonomically designed plastic cabinet. With a suggested retail price of \$889, the Diamond Scan is available immediately through distribution channels.

For further information contact Evie Turner, Mitsubishi Electronics America, Inc., Computer Peripherals Division, 991 Knox St., Torrance, CA 90502. 213/515-3993.

Circle no. 11

AutoCam recorder makes prints and slides

The first multisync film recorder delivering high-quality instant color prints and slides is being introduced by Focus Graphics. The Focus Graphics AutoCam

is designed to provide highly accurate reproductions on 35mm slides and instant color prints from any video source—personal computers, video cameras, image processing systems, electronic imaging systems, CAD/CAM workstations, and display terminals. Since the AutoCam is software independent, it will produce a print or slide from any image generated on a video display. The unit requires no manual adjustment as it calibrates itself automatically for different video characteristics. Exposure values for all commonly used films are already programmed into the unit's memory.

The unit was also specifically designed to take advantage of the latest generation of graphics boards supporting up to 16 million simultaneous colors and resolutions up to 1280 pixels by 1024 lines. The AutoCam is particularly suited for the reproduction of gray-scale, shaded, or



three-dimensional images for applications such as medical imaging, solid modeling, graphic design, and research and development, and for electronic-imaging applications merging live video and graphics.

The AutoCam image recorder digitizes video signals compatible with a variety of standards including TTL RGB, RS-170, or RS-343. Brightness and contrast are calibrated automatically. The AutoCam is

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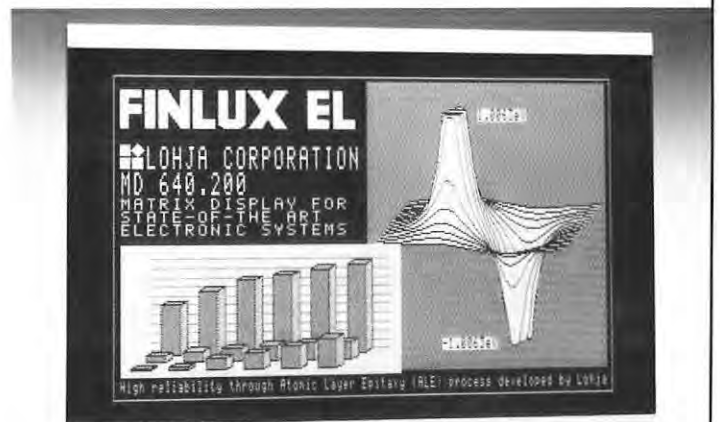
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- Effective display area: 98 mm (H) by 195 mm (W)
- Number of dots: 512 by 256
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- Low Power

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- Number of dots: 640 by 200
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Circle no. 12

new products

a highly intelligent unit that automatically enhances the images as they are being recorded. It performs edge and contrast enhancement, corrects gray levels and colors to match particular film profiles, and eliminates raster lines through a unique smoothing process.

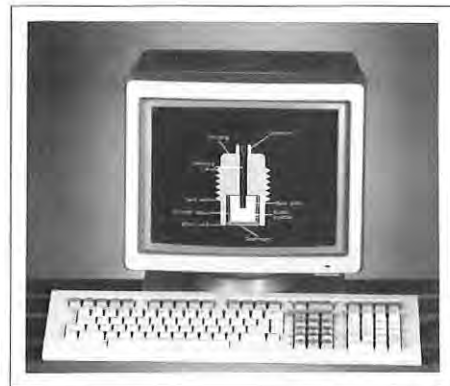
Equipped with the motorized Polaroid CB-33 AutoFilm camera back, the AutoCam recorder delivers a 3 x 4-in. type 339 instant color print. Type 339 film is a self-developing integral film matching the aspect ratio of video displays. Equipped with the 35mm motorized camera back, the AutoCam accepts all standard 35mm films including Ektachrome and Polachrome for slides. Focus Graphics expects to begin distribution of the AutoCam through OEMs and value-added resellers in the second quarter of 1987. The suggested list price in the U.S. will be less than \$2500.

For further information contact Judy Nash, Focus Graphics, Inc., 10 Twin Dolphin Dr., R305, Redwood City, CA 94065. 415/595-6920.

Circle no. 13

Color alphanumeric/graphics terminals

The GO-400 Series is GraphOn's first family of color composite terminals. The series addresses the growing demand for color terminals with the performance and convenience of monochrome terminals at affordable prices. Each GO-400 Series terminal supports a range of industry standard interfaces from Tektronix (4100/4200 series) and Digital Equipment Corporation (VT220 and ReGIS graphics).



GraphOn maximizes the image size for each emulation mode despite differing pixel resolutions. This is achieved by varying the video dot clock, refresh rate, and image aspect ratio on the screen. Thus, each image resolution represents as large an image as possible on the display con-

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Circle no. 30

sistent with correct image aspect ratio.

The GO-400 Series uses the new high-resolution (0.26-mm screen pitch) Trinitron CRT. It provides sharp focus, high brightness, freedom from doming, and high efficiency (no fan is required in the unit). The CRT face is flat in the vertical axis which reduces screen glare from overhead light sources. High-speed video refresh (minimum 60-Hz non-interlaced) eliminates flicker, and the short persistence P-22 phosphor eliminates smearing.

The GO-400 Series uses a 16-bit 68000 microprocessor running at a 10-MHz clock speed for communications and system functions. A Texas Instruments TMS34010 Graphics System Processor (GSP) handles graphics operations from line drawing to windowing. With communication speeds available up to 57.6 kbits/sec, the GO-400 Series is designed for consistently high throughput of graphics and alphanumerics. Compact packaging provides a small footprint (12 x 12 in.) on the desktop with built-in tilt and swivel for the 14-in. display. The low-profile keyboard is a modified version of the VT220 layout.

The GO-405 emulates the Tektronix 4205 (480 x 360 resolution) and supports ReGIS (800 x 520 resolution). Full VT220 support includes 132 column screen display. Enhancements include 16 pages of local alpha storage, a 4096 color palette, 1 parallel and 3 serial ports, and up to 52 lines of text on the screen. List price is \$2995.

The GO-407 emulates the Tektronix 4207 (640 x 480 resolution), and it provides ReGIS (800 x 520 resolution) and full VT220 alphanumerics. Enhancements include 32 pages of local alpha storage, up to 52 lines of text, 256 colors from a palette of 16 million, raster operators, and local storage for two full 16-color graphics images. List price is \$3795.

The GO-411 emulates the Tektronix 4111 (1024 x 768 resolution) and 4207 (640 x 480 resolution), with ReGIS (800 x 520 resolution) and full VT220 alphanumerics. Enhancements include 32 pages of alpha storage, up to 52 lines of text, 256 colors from a palette of 16 million, raster operators, and local storage for two full graphics images. List price is \$5995.

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Circle no. 15

The following options are available on all models: current loop interface, mouse pointing device, 1 Mbyte RAM upgrade, and video output. Additionally, the GO-405 and GO-407 can be upgraded to higher models. The GO-400 Series will

be available for shipment in April.

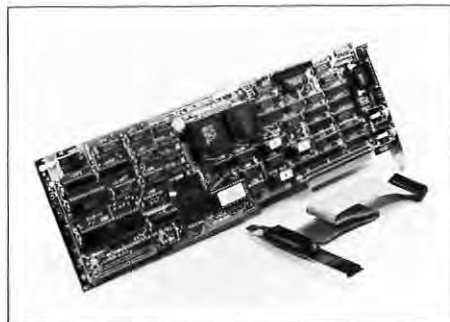
For further information contact Mason Killebrew, GraphOn Corporation, 1901 South Bascom Ave., Campbell, CA 95008. 408/371-8500.

Circle no. 16

new products

Color graphics board delivers PGA resolution at EGA price

NEC Home Electronics (U.S.A.), Inc. has introduced the MultiSync Color Graphics Board Model GB-1, and ultra-high-resolution (640 × 480) 16-color display card (from a palette of 64 colors) for use



with an NEC MultiSync Color Monitor or its functional equivalent. The MultiSync Color Graphics Board matches the IBM Professional Graphics Controller (PGC) or Professional Graphics Adapter (PGA) in resolution but at an Enhanced Graphics Adapter (EGA) price. The suggested retail price for the model GB-1 is \$649.

Compatibility for running software in Color Graphics Adapter, CGA, EGA, Monochrome Display Adapter (MDA), and Hercules modes is made possible through the MultiSync Color Graphics Board's hardware trapping which is reported to be faster than software trapping and supports all functions of true EGA. Users with extensive software libraries won't have to update their software. Text modes display a full page of text (80 characters × 60 lines) or spreadsheets with up to 132 columns × 44 lines.

Other features include a parallel printer port, which supports the I/O port of the LPT1 or LPT2 to open up a slot on the user's PC, and a free printer spooler utility for higher user productivity; hardware zoom and viewport to allow users to zoom in up to eight times closer to magnify screens for detailed viewing or pixel editing; and potential 300% speed improvement by using an ET2000 chip set with a micro-engine to assume certain CPU functions, such as memory write/read tasks associated with bit-mapped graphics displays.

Purchasers of the MultiSync Color Graphics Board will receive Dr. Halo II software, a \$149 retail value, at no extra charge. The MultiSync Color Graphics Board Model GB-1 is 13.3 × 4.25 × 0.95 in. (including the CMII IBM Color Graphics Adapter and Hercules Graphics

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Circle no. 17

Card (720 × 348) compatibility module).

For further information contact Marion Black-Ruffin, NEC Home Electronics (U.S.A.), Inc., 1255 Michael Dr., Wood Dale, IL 60191. 312/860-9500 ext. 4244. **Circle no. 18**

Image-processing system

Image analysis, using a video frame store developed in Britain, can be linked to a computer for robotic vision, medical imaging, x-ray analysis, factory inspection, and many other applications in industry and research. The IMAGE III frame store can capture and display high-resolution pictures in real time from any 625/525 line video source. Once stored in the 512 × 512 frame memory, every pixel can be accessed by the computer for processing

or manipulation.

The video store board was developed at the British Telecom Research Laboratories as a low-cost digital picture store with hardware selectable resolution. It uses 6-bit A/D and D/A converters to give up

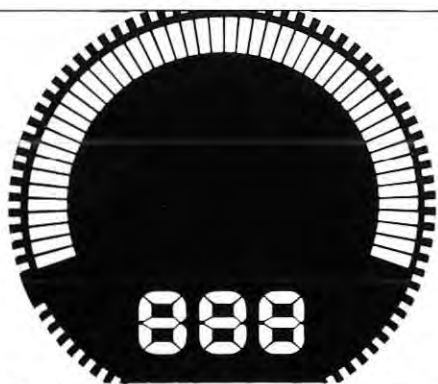


to 64 gray levels for each pixel. The IMAGE III can store multiple pictures at lower resolutions. For example, four pictures can be stored at 256 × 256 pixels to

allow the computer to compare pictures from the same or from the different video sources. Once captured, pictures can be stored on disk via the microprocessor. Each frame store consists of a V1500 video store board housed in a slimline case with an electrical power supply and a computer interface card. Three interface cards are available to connect the board directly to the IBM PC, BBC, or Apple computer. Other interfaces are under development. The frame store case can be either free standing or rack mounted.

For further information contact Mr. D. Hurst, Eltime, Ltd., Unit D29, Maldon Industrial Estate, Fullbridge, Maldon, Essex CM9 7LP, England, 0621-59500; or Ms. Sandra Paul, British Information Services, 845 Third Ave., New York, NY 10022, 212/752-8400. ■

Circle no. 19



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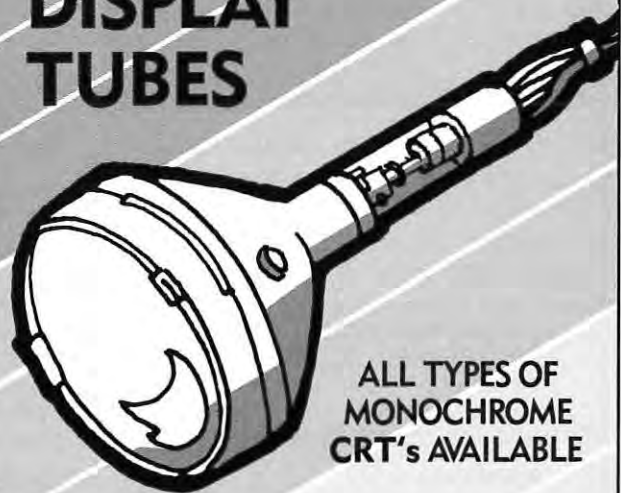
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Circle no. 21

CRTs in the USA

The U.S. market for entertainment and color data display CRTs has been growing steadily due to increased color TV assembly capacity and greater use of color monitors for commercial and industrial displays. A new report from International Competitive Assessments projects the growth in these markets over the next five years and analyzes the current market strategies of domestic and foreign, primarily Japanese and Korean, suppliers. *The U.S. CRT Market, 1986-1991*, details the economic and political factors which have begun to drive the domestic industry toward resurgence. Projections for the color data display market comprise a major portion of the study. Forecasts for monitors and tubes are derived from system capacities and display requirements

of key markets such as CAD/CAM, CAE, business, and process control, and are broken down by performance requirements and tube size. The cost of the study is \$12,000, or \$7000 for the data display portion alone. For further information contact Stephen Metzger, International Competitive Assessments, 170 Broadway, Suite 201, New York, NY 10038. 212/312-6337.

Circle no. 22

“Find out about . . .”

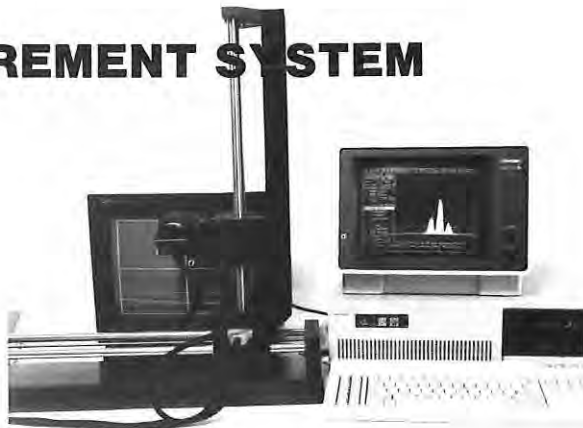
Finding Out . . . About Information Technology, the latest title in the “Finding Out . . .” children’s series published by Hobsons Limited, U.K., explains the development of information technology,

some of its uses, and how it will help shape the future of business and leisure. Digital recording, telecommunications networks, office automation, computer-aided design and manufacturing, weather forecasting, and artificial intelligence are some of the topics explored in the 24-page full-color booklet. Written by teachers, the booklet is designed for 14- 18-year-old students of science and general studies. Each chapter contains exercises and activities to help students explore the subject. British Telecom and Rank Xerox provided publishing subsidies, so that the cost to schools could be kept low. The price is £1.40 ea. for single copies or 90p ea. for 10 or more copies, plus postage and handling. For information contact CRAC Publications, Hobsons Limited, Bateman St., Cambridge CB2 1LZ, England. 0223-314640. ■

Circle no. 23

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Circle no. 25

Bay Area Chapter

Don Kline of **Panavision** spoke on high-definition television (HDTV) at the Bay Area Chapter's March 17 meeting. Mr. Kline covered current trends and the suitability of various CRT and projection display technologies for HDTV.

Lyn Reynolds of **Apple Computer** will be the Bay Area's guest speaker at the April 21 meeting. Mr. Reynolds will discuss "Display Needs for the Personal Computer."

Los Angeles Chapter

The February 25 meeting of the Los Angeles Chapter featured **Larry F. Weber** of the Computer-based Education Research Laboratory of the **University of Illinois at Urbana-Champaign**, speaking on "New Images for Plasma Displays." Dr. Weber described and demonstrated his new very thin plasma panel that uses only eight display drive chips for a full 512×512 pixel display. Dr. Weber also reviewed recent developments in full-color plasma displays and in very large plasma displays.

Mid-Atlantic Chapter

"The AT&T Soft Touch Screen" was discussed by **Thomas Schwartz** of **AT&T Information Systems** at the February 10 Mid-Atlantic Chapter meeting. The soft touch design has an unusually "friendly" feel and good response, and is also inherently aligned to the CRT raster and hence free of any drift or alignment problems. The screen is currently marketed on AT&T's 9-in. Personal Terminal 510. Further development will concentrate on simplifying construction to allow a wide variety of shapes and sizes at a reduced cost.

The Annual SID-MAC Banquet has been tentatively scheduled for April 11 at the New York Hall of Science. Please contact Chairman Ron Feigenblatt (914/945-3312) or Secretary Douglas Ketchum (201/696-5200) for details.

Minneapolis-St. Paul Chapter

At the February 27 Chapter meeting members heard two interesting presentations by members of the **St. Paul Ramsy Medical Center**. **Dr. L'Heureu**, Head of

the Radiology Dept., and **Dr. Joseph Tashjian** spoke about "Computer Tomography, Nuclear Medicine, and Ultrasound." Dr. Tashjian explained and demonstrated operation of the hospital's CAT scanner and ultrasound machine. ■

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Circle no. 26

April

Machine Vision and Image Recognition—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231. 800/421-8166.
Apr. 7-10 Palo Alto, CA

Digital Signal Processing—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231. 800/421-8166.
Apr. 7-10 Toronto, Canada

Market Forecast for Electro-Optical Systems—Short Course. Advanced Technology International, Dept. EOC, 1901 Pennsylvania Ave. N.W., Suite 804, Washington, DC 20006. 202/223-8840.
Apr. 10 Boston, MA

Third Photoreceptor Industry Conference. Diamond Research Corp., P.O. Box 128, Oak View, CA 93022. 805/649-2209.
Apr. 12-14 Santa Barbara, CA

Display Workshop on CRTs, Flat Panels, and Touch Entry. (Sponsored by SID, New England Chapter.) Melvin Silverstein, Chairman, SID N.E. Chapter, 19 Wichita Rd., Medfield, MA 02052. 617/359-6063.
Apr. 15 Sudbury, MA

CD-ROM vs. Micrographics—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
Apr. 20-22 Monterey, CA

Intelligent Digitizing/Intelligent Infrastructure—Short Course. F-M Automation Newsletter, 9501 W. Devon Ave., Suite 203, Rosemont, IL, 60018-4804. 312/823-0555.
Apr. 21-22 Washington, DC

Integrated Voice/Data Communications and ISDN—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Avenue, P. O. Box 3614, Culver City, CA 90231-3614. 800/421-8166.
Apr. 21-24 San Diego, CA

Machine Vision and Image Recognition—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231. 800/421-8166.
Apr. 21-24 Washington, DC

Artificial Intelligence and Advanced Computer Technology Conference and Exhibition. Tower Conference Management, 331 W. Wesley St., Wheaton, IL 60187. 312/668-8100.
Apr. 22-24 Long Beach, CA

Electronic Newspaper Production—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
Apr. 22-24 Amsterdam, Netherlands

3rd Annual Artificial Intelligence and Advanced Computer Technology Conference and Exhibition. Tower Conference Management Co., 331 W. Wesley St., Wheaton, IL 60187. 312/668-8100.
Apr. 22-24 Long Beach, CA

Fiberoptic Venture '87. June Warren, Kessler Marketing Intelligence, America's Cup Ave. at 31 Bridge St., Newport, RI 02840. 401/849-6771.
Apr. 23 Boston, MA

Integration of Text and Graphics—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
Apr. 27-29 Bedford, MA

IEEE Computer Society Symposium on Office Automation. Vincent Lum, Dept. of Computer Science, Naval Postgraduate School, Monterey, CA 90045. 408/646-2449.
Apr. 27-29 Gaithersburg, MD

CLEO '87: Conference on Lasers and Electro-Optics. Optical Society of America, 1816 Jefferson Pl. N.W., Washington, DC 20036. 202/223-8130.
Apr. 27-May 1 Baltimore, MD

IQEC '87: International Quantum Electronics Conference. Optical Society of America, 1816 Jefferson Pl. N.W., Washington, DC 20036. 202/223-8130.
Apr. 27-May 1 Baltimore, MD

Reliability Engineering—Short Course. Rochester Institute of Technology, College of Continuing Education, 50 W. Main St., Rochester, NY 14614. 716/475-5079.
Apr. 27-May 1 Rochester, NY

British Electronics Week. Show Organizer, British Electronics Week, The Hub, Emson Close, Saffron Walden, Essex CB10 1HL, England. 799/26699.
Apr. 28-30 London, England

Digital Signal Processing—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231. 800/421-8166.
Apr. 28-May 1 Washington, DC

May

Intelligent Digitizing/Intelligent Infrastructure—Short Course. F-M Automation Newsletter, 9501 W. Devon Ave., Suite 203, Rosemont, IL, 60018-4804. 312/823-0555.
May 5-6 New York, NY

HouseWorld Expo/Australia. The Interface Group, Inc., 300 First Ave., Needham, MA 02194. 617/449-6600.
May 5-7 Sydney, Australia

Communication Systems Design: Digital and Data Link Applications—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Avenue, P. O. Box 3614, Culver City, CA 90231-3614. 800/421-8166.
May 5-8 Palo Alto, CA

Fiber Optic Communications—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231-3614. 800/421-8166.
May 5-8 Washington, DC

37th Electronic Components Conference. Doug Loerscher, Sandia National Labs., Div. 2123, P.O. Box 5800, Albuquerque, NM 87185. 317/261-1306.
May 11-13 Boston, MA

calendar

EICO '87: 4th European Conference on Integrated Optics, Electro-Optics, and Sensors. SPIE, P.O. Box 10, Bellingham, WA 98227-0010. 206/676-3290.
May 11-13 Glasgow, Scotland

New Opportunities for Video Publishing—Short Course. Institute for Graphic Communications, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
May 11-13 Monterey, CA

SID '87: Society for Information Display International Symposium, Seminar and Exhibition. Palisades Institute for Research Services, Inc., 201 Varick St., Suite 1140, New York, NY 10014. 212/620-3388.
May 11-15 New Orleans, LA

IEEE Workstation Technology and Systems Workshop. Ralph J. Preiss, 12 Colburn Dr., Poughkeepsie, NY 12603.
May 12-13 Cherry Hill, NJ

Interface '87: Fifth Symposium on Human Factors and Industrial Design in Consumer Product Design. James Wilson, Eastman Kodak Co., Human Factors Dept., Bldg. 320, 2nd Fl., Rochester, NY 14650. 716/722-6627.
May 13-15 Rochester, NY

Thermal Printing—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
May 13-15 Amsterdam, Netherlands

Laser Optical Disk and Video-Based Information Systems. American Society for Information Science (ASIS), 1424 16th Street N.W., Washington, DC 20036.
May 17-20 Kings Island, OH

1987 Technical Symposium Southeast on Optics, Optoelectronics. SPIE, P.O. Box 10, Bellingham, WA 98227-0010. 206/676-3290.
May 17-22 Orlando, FL

SPSE '87: 40th Annual SPSE Conference and Symposium on Hybrid Imaging Systems. Pam Fornas, SPSE, 7003 Kilworth Lane, Springfield, VA 22151. 703/642-9090.
May 17-22 Rochester, NY

Opportunities in Flat-Panel Displays—Short Course.

N. Ronnie Sarkar, Arthur D. Little, Inc., 15 Acorn Park, Cambridge, MA 02140. 617/864-5770 ext. 2377.
May 18 Boston, MA

Digital Facsimile—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
May 18-20 Bedford, MA

NAECON '87: A National Forum for the Exchange of Aerospace Electronics Information. Cindy Porubcansky, Wright-Patterson AFB, OH 45433. 513/255-4848.
May 18-22 Dayton, OH

Intelligent Digitizing/Intelligent Infrastructure—Short Course. F-M Automation Newsletter, 9501 W. Devon Ave., Suite 203, Rosemont, IL, 60018-4804. 312/823-0555.
May 19-20 Boston, MA

EMC Expo '87. Sandra Hamilton, EMC Expo '87, P. O. Box D, Gainesville, VA 22065. 703/347-0030.
May 19-21 San Diego, CA

Fiber Optic Communications—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA, 90231-3614. 800/421-8166.
May 19-22 San Diego, CA

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Hard Copy Processes for the Future—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
May 20-22 Bedford, MA

CG Int'l '87: Conference on Computer Graphics in Japan. Prof. Toshiyasu L. Kunii, Kunii Laboratory of Computer Science, University of Tokyo, 7-3-1 Hongo, Bunkyo-Hu, Tokyo 113, Japan. (03) 812-2111.
May 25-28 Karuizawa, Japan

West Coast Desktop Publishing Roundtable. NCGA, 2722 Merrilee Dr., Suite 200, Fairfax, VA 22031. 703/698-9600.
May 27 San Francisco, CA

Second Annual Conference on Optical Storage for Large Systems. Judith Hanson, Technology Opportunity Conference, P.O. Box 14817, San Francisco, CA 94114-0817. 415/626-1133.
June 9-11 New York, NY

Electronic Imaging Industries—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
June 14-16 Monterey, CA

National Computer Conference. Marketing Department, AFIPS, 1899 Preston White Dr., Reston, VA 22091. 1-800/NCC-1987.
June 15-18 Chicago, IL

Flat Panel Displays 1987 International Conference. International Planning Information and Stanford Resources, Inc. (IPI), Nordre Ringvej 201, DK-2600 Glostrup, Denmark. 45 2 63 2044.
June 17-18 Copenhagen, Denmark

45th Annual Device Research Conference. Jerry Woodall, IBM Corp., P.O. Box 218, Yorktown Heights, NY 10598. 914/945-1568.
June 22-24 Santa Barbara, CA

MARSIM '87: Fourth International Conference on Marine Simulation. Marsim '87, c/o SMS, Ladehammerv 6, 7000 Trondheim, Norway. 47-7-51-14-11.
June 22-24 Trondheim, Norway

June

COMDEX/Spring. The Interface Group, Inc., 300 First Ave., Needham, MA 02194. 617/449-6600.
June 1-4 Atlanta, GA

Integrated Voice/Data Communications and ISDN—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Avenue, P. O. Box 3614, Culver City, CA 90231-3614. 800/421-8166.
June 2-5 Toronto, Canada

Images on CD-ROM—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425.
June 3-5 Amsterdam, Netherlands

Special Applications for Electrostatic Imaging. Diamond Research Corp., P. O. Box 128, Oak View, CA 93022. 805/649-2209.
June 7-9 Santa Barbara, CA

International Conference on Computer Vision. Azriel Rosenfeld, Univ. of Maryland, Center for Automation Research, College Park, MD 20742. 301/454-4526.
June 8-11 London, England

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Munich Laser Show. SPIE, P.O. Box 10, Bellingham, WA 98227-0010. 206/676-3290. June 22-26 Munich, West Germany

Fiber Optic Communications—Short Course. Marilyn Martin, Integrated Computer Systems, 5800 Hannum Ave., P. O. Box 3614, Culver City, CA 90231-3614. 800/421-8166. June 23-26 Boston, MA
June 23-26 Palo Alto, CA

Symposium on Marketing Trends in Photoelectronic Imaging. Conference Manager, SPSE, 7003 Kilworth La., Springfield, VA 22151. 703/642-9090. June 24-25 New York, NY

Color Hard Copy—Short Course. Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. 617/267-9425. June 28-30 Bedford, MA

Call for Papers

129th SMPTE Technical Conference and Equipment Exhibit. Oct. 30-Nov. 4, Los Angeles, CA. Papers are sought on motion picture and TV technology. Topic headings have not been determined, but past sessions have focused on laboratory practices; film and video post-production; film and electronic production; computer applications for TV; digital applications for TV; and enhanced TV systems. Send

name, address, paper title, and a 100-word abstract to Dollie Hamlin, Society of Motion Picture and Television Engineers, 595 W. Hartsdale Ave., White Plains, NY 10607. 914/761-1100. Deadline for abstracts: June 15

1988 SCS Multiconference. Feb. 3-5, 1988, San Diego, CA. Papers are solicited in the following areas of interest: modeling and simulation on microcomputers, power plant simulation, aerospace simulation, distributed simulation, and simulation and artificial intelligence. Send an original, unpublished paper proposal of 300 words, specifying area of interest, to: Society for Computer Simulation, P.O. Box 17900, San Diego, CA, 92117. 619/277-3888. Deadline for abstracts: June 1 ■

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