

Chapter News

BAY AREA CHAPTER on December 20 enjoyed a presentation entitled "Electronic Displays in Japan" by Joseph A. Castellano, president and founder of Stanford Resources, Inc., San Jose. Quoting SID President Gus Carroll, who is also acting Chapter Chairman: "LCDs, portable computers, hand held b/w TVs, vacuum fluorescent displays, electroluminescent panels, plasma display panels and CRTs, and other active and passive display technologies are currently being researched. Japan is the unquestioned leader in many of these fields and is now being viewed as not only a quality high volume producer but as an innovator as well. This raises the question of the impact on development activities in the U.S. and Europe." Castellano was one of the many SID Members who attended both Japan Display '83 and the Japanese Electronics Show as well as leading research centers. His comments were especially interesting from a business viewpoint because he and his firm are recognized market research experts in information displays and related industries.

DELAWARE VALLEY CHAPTER in a meeting late this month (January 1984) will be treated to a presentation on Videotex by William Frezza, program manager, Communication Terminals Department, Jerrold Electronics, Philadelphia. Frezza is a member of the ANSI X3L2.1 Committee responsible for the development of Videotex/Teletext Standards for the U.S. and Canada. Thanks to Chapter Chairman Steve Filarski for this advance information.

LOS ANGELES CHAPTER on December 7 again had a large turnout, more than 50 SID Members, to enjoy a presentation by Tei Iki, Sony Corporation, San Diego, featuring a description of the Trinitron construction and demonstration of several high resolution examples of this color CRT. Iki showed the audience samples of the single-gun construction including its one large lens, electrostatic focusing, magnetic deflection, and the unique aperture grille. He made some comparisons between the Trinitron features and conventional color CRTs with three guns and a shadow mask. From your Editor's view, the pictures presented on the Trinitron screens by Iki and his associates from Sony were outstanding in brilliance,

contrast, color clarity, and definition. Chapter Chairman Kevin Kilcoyne complimented Program Chairman Pete Baron for arranging consistently good technical meetings, which brought loud applause.



Part of the large SID crowd at the Trinitron demonstration, LA Chapter meeting on December 7.

MID-ATLANTIC CHAPTER on November 8 heard a presentation from Dr. Allan R. Kmetz, Bell Laboratories, on "Flat-Panel Displays for High Information Content." This was based on the speaker's keynote address at Japan '83. He covered under one principal heading of emissive flat panels, plasma displays, electroluminescents, vacuum fluorescents, and flat CRTs; and then described developments in liquid crystal displays including multiplexed twisted nematics and active substrate addressing. His conclusions were: "The CRT is at once the best performer and the cheapest candidate (with) efficient, high-resolution color. It is unchallenged for home TV and will continue to dominate computer terminals. An exception is the market for portable computers... the full-page multiplexed LCD enjoys a unique position (at) 1/3 the cost of other flat panels... Those applications not covered by CRTs, LCDs or printers constitute the premium flat panel market, which must be shared by EL, PDP and VFD."

On December 13 another large SID-MAC audience heard

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INFORMATION DISPLAY

JANUARY 1984

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Information Display

The Official Journal of the Society for Information Display

JANUARY 1984



Dr. Robert W. Lester, president of Static Systems Corporation, New York City, a longtime SID Member, has recently reported considerable progress in imaging with liquid crystal displays built into the covers of copiers to eliminate mechanical printers. Now that large area flat panel LCDs are finally a reality, one of the largest Japanese copier companies has exercised their option for a license from Lester's firm. This will be reported in a subsequent issue. Liquid crystal displays comparable to a CRT terminal are this month available from Epson and soon will be supplied by Sharp and NEC. These new displays were recently shown in Japan during the 3rd International Display Research Conference. Automatic

copiers smaller than a CRT terminal are now on the market with throwaway, maintenance-free cartridges. Adding an inexpensive telephone modem permits facsimile as an additional service. The Static System, according to Bob Lester, does away with printers, noise, ribbons and maintenance. Just plugging in a keyboard with memory to the visual and imaging copier display provides a complete word processing system plus a copier. The small office and home personal computer market would be a candidate for this low cost solid state printing method in the opinion of Lester, who developed the liquid crystal display copier-printer. More data is supplied on pages 4 and 6.

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

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SOCIETY FOR INFORMATION DISPLAY

654 No. Sepulveda Blvd., Los Angeles, CA 90049
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SID Calendar 1984

January	16	SID Board of Directors Meeting, San Francisco
	17-18	Panel to select Papers for SID '84 International Symposium, San Francisco
June	4-8	SID International Symposium, Seminar and Exhibition, San Francisco Hilton
September	18-20	4th International Display Research Conference, Paris, France
Other Events		
January	22-27	SPIE Critical Review of Technology/Optical Computing; Advances in Display Technology on January 24-25, Marriott Hotel, Los Angeles
	26-29	3rd Annual Pacific Computer Expo, San Diego Convention and Performing Arts Center
February	20-22	1984 Office Automation Conference, Los Angeles Convention Center
	21-23	Softcon, Louisiana Superdome New Orleans
	22-24	IDBMA/Pick Spectrum '84, Reno, Nevada
	26-29	Medical Image Production, Processing, Display, and Archiving (SPIE), San Diego
March	26-29	National Design Engineering Conference, McCormick Place, Chicago
April	4-11	CeBIT Office and Data Technology, Hannover Fair, West Germany
	5-7	COMDEX, Los Angeles Convention Center
May	22-26	Office and Information Conference, Seoul, Korea
June	12-14	INFO/SOFTWARE, McCormick Place, Chicago
	19-21	Computerized Office Equipment Exposition/Office Information Systems Conference, O'Hare Exposition Center, Rosemont, IL
July	9-12	National Computer Conference, Las Vegas Convention Center

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The Display Copier's Liquid Crystal Display Interfaces with Copy Machine

by Dr. Robert W. Lester, President,
Static Systems Corporation, New York City

THE INFORMATION DISPLAY INDUSTRY HAS BEEN ANXIOUS TO REPLACE THE CRT WITH FLAT PANEL DISPLAYS SUCH AS THIS ONE YOU'RE LOOKING AT. ADVANTAGES OF LIQUID CRYSTAL FLAT PANEL DISPLAYS OVER CATHODE RAY TUBES ARE AS FOLLOWS: THE CRT TAKES TWENTY TIMES MORE SPACE THAN A FLAT PANEL DISPLAY. THE CRT WEIGHS AT LEAST TEN TIMES MORE THAN THE FLAT PANEL DISPLAY. THE CRT REQUIRES A FIFTEEN TO TWENTY-FIVE THOUSAND VOLTS STEP-UP TRANSFORMER. THE CRT USES AVERAGE ONE HUNDRED WATTS AT ONE HUNDRED TWENTY VOLTS. THE LC DISPLAY USES LESS THAN ONE WATT AT ONLY ONE VOLT. STATIC SYSTEMS CORPORATION HAS DEVELOPED A PRINTING SYSTEM ALLOWING LETTERS OR OTHER DOCUMENTS TO BE PRINTED BY ANY FLAT BED PHOTOCOPIER. THE STATIC-TYPER SYSTEM UTILIZES REFLECTIVE TYPE LIQUID CRYSTAL DISPLAYS WHICH ARE IMAGED BY PLACING THE DISPLAY ON THE COPY MACHINE OR BUILDING IT INTO A REPLACEABLE COVER ADAPTER. THE WORD PROCESSOR USER TYPES THE TEXT DOCUMENT AND AFTER EDITING SAME INPUTS THE TEXT TO THE LIQUID CRYSTAL DISPLAY ON THE COPIER. THIS SYSTEM NOT ONLY ELIMINATES NOISY EXPENSIVE SPACE-CONSUMING PRINTERS BUT PAYS FOR ITSELF IN A FEW YEARS ANOTHER SIGNIFICANT ADVANTAGE IS COUPLING TO A TELEPHONE DATA UNIT TO SEND OR RECEIVE TO REMOTE COPIERS ANYWHERE THEREBY ELIMINATING TELETYPE AND TELEX MACHINES. GRAPHIC QUALITY DISPLAYS WILL ALSO BE AVAILABLE IN THE NEAR FUTURE ALLOWING THE USE OF A DIGITIZING SCANNER TO TRANSMIT PICTURES, SIGNATURES, DRAWINGS AND SO FORTH. SIMPLY PUSHING THE BUTTON FOR THE NUMBER OF COPIES DESIRED WOULD ALLOW THE MILLIONS OF EXISTING COPIERS TO BE CONVERTED INSTANTLY TO WORD PROCESSING PRINTERS YET STILL RETAINING THE FUNCTION OF DUPLICATING ORIGINALS WITHOUT ALTERING COPIER.

Sample of Copier Printout from a Large Area LCD Reflective Type

Imagine sitting down at a keyboard equipped with memory, typing a letter, and having the office copier "print" it out. To date, direct interface between text-editing equipment and copiers has only been possible via expensive communicating equipment.

The Static Systems Display Copier is a new breed of photocopier that doubles as a computer printer. The machine looks and costs nearly the same as today's office copiers. But it can be hooked up to any computer or word processor and turn out a page in a few seconds. The copier can produce graphics, forms, labels, financial statements — anything a conventional computer dot-matrix printer can do now. What you see on the liquid crystal display screen is exactly what you get. One advantage: no fragile printing mechanisms to jam or break. The flat panel display is built into the copier cover.

A direct-driven LCD without any polarizers will be available from Crystal Vision in California this March. With 32 lines of 80 characters, including the controller board, it is priced in the \$300.00 area in thousand quantities. A dot matrix ribbon printer would be far more expensive than an LCD panel in a copy machine cover.

The Static Systems Display Copier is about the same size and weight as a typewriter at slightly less cost, but a typewriter does only one thing whereas the Display Copier offers eight functions: 1. Visual Display; 2. Printer; 3. Copier; 4. Computer; 5. Calculator; 6. Word Processor; 7. Typewriter; 8. Facsimile.

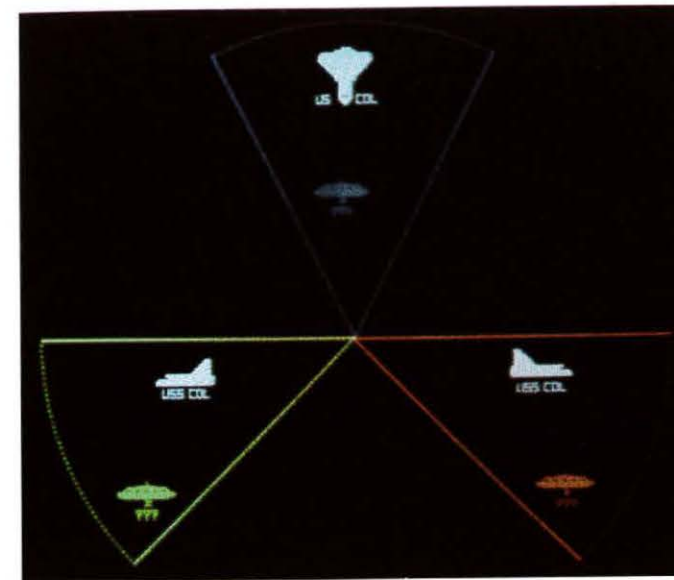
Since the copy machine is so small, the keyboard can

be placed in front of it as is normally done with a terminal. When the cover is lifted, it can be swiveled to allow the visual reading of the display. This eliminates the necessity of having two displays, one for the keyboard and one for imaging on the copy machine. This eliminates printers

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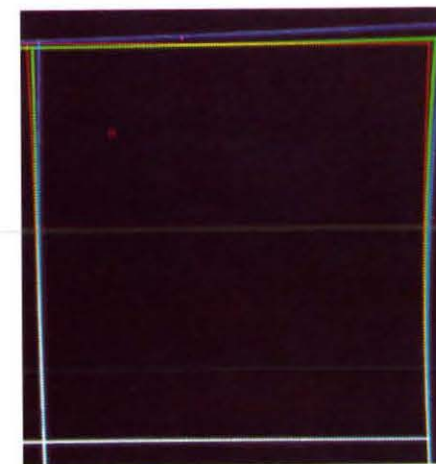
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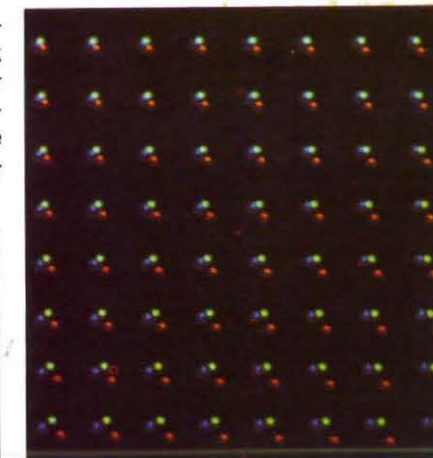
The CELCO Color Yoke Produces Perfect B&W

Engineers who design color displays requiring low inductance look for **perfect black and white** on their test patterns for best convergence. They do not want to see the beautiful colors illustrated in the error patterns — just black & white.



Typical Convergence Error Problem

CELCO color yokes provide complex magnetic fields to be compatible with your color CRT. The Yoke-CRT combination is optimized to achieve color purity and best convergence for your display applications. A precision color yoke is required to deflect the beam to the correct apertures in the shadow mask. These impinge on the proper phosphors to produce the blue, green, and red patterns.



Typical Dot Pattern Error Problem

Over twenty years ago CELCO designed and built low-inductance color *Deflectrons® for delta gun CRTs for military color information displays. Today's new generation of cockpit, air traffic control, flight simulation, ground and ship based radar and graphic displays, require precision deflection of the three in-line electron beams to produce the required colors **anywhere** on the CRT face!

CELCO supplies color yokes with a wide range of inductances and specializes in **low**-inductance color yokes for high-speed, random positioning and vector displays.

*CELCO Low-Inductance Color Yokes may be used with your own amplifier designs. They are also com-

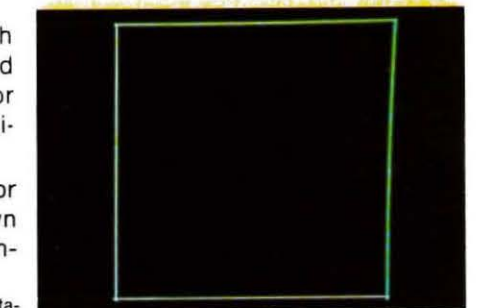
*Deflectron® is our registered trademark for Delta-Gun Deflection Yokes in the 1950's.

patible with CELCO High Speed X-Y Deflection Amplifiers for wide bandwidth, ultra-linearity, and high stability. CELCO Deflection Amplifiers are available in ranges from 20 to 75 volts with a change of 4 to 20 amps.

For every CRT face size and neck diameter for In-Line, Delta, or Color Penetration Yoke requirements call John Constantine, Jr. Yoke Designer or Dr. Sam Christaldi, Engineering Sales Manager, Mahwah, New Jersey at (201) 327-1123. (Or call Michael Constantine, President or Bud Reese, Manager, in Upland, California at (714) 985-9868.)



Typical CELCO Color Yoke Solutions



Celco's in-line color Yoke for perfect black & white.



Your plant is only hours away by CELCO Air Fleet piloted by CELCO design engineers.

Continued from page 4

and is a cost-saving system for the small office and the home personal market. A medium quality printer today costs more than a new copy machine. Everyone needs a copy machine, and since a copier is a printer it should serve a dual purpose.

All office word processing computer terminals consist of four basic parts: a keyboard, memory, visual display, and a printer. The Static System concept also has four basic parts: a keyboard, memory, visual display and a copy machine. However, the small copier used in the Static System images the new LCD built into the cover of the copier to give hard copy print output from the same visual display. The copier printer serves a dual purpose since it retains its function for copying originals. The Static Systems' copier-display-printer unit keyboard takes up less room than a standard CRT type terminal with printer and there is no noise or wasted printer space. The copier-printer speed is only a few seconds per page as compared with a minute or more for low-cost printers. There is also no need for ribbon or maintenance necessary with a separate printer. Elimination of a printer is equal to the cost of a separate copy machine. In effect the copy

machine is free and the savings on ribbons and maintenance pays for the system in time.

The new miniature desk-top copiers with throwaway cartridges are essentially maintenance free and equal in cost to a low-priced printer for the small office. Since every office needs a copy machine, this is in fact a free bonus with all offices moving toward individual satellite copiers for each room or even one or more secretaries sharing a copier. This saves time lost going to a large expensive central copier which has occasional breakdowns. In conclusion, comparison of the Static Systems unit with the standard system shows lower cost.

Standard System:

CRT Display Terminal and Keyboard,
Printer (separate),
Copier (separate).

Static Systems:

Small-Copier Printer with Visual and Imaging Flat Panel Display. (Keyboard slides under copier.)

For more information contact Dr. Robert Lester, President, Static Systems Corporation, 45 Rockefeller Plaza, New York, N.Y. (212) 957-8400.

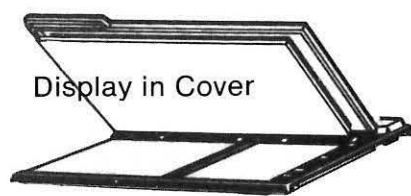
Goodbye — Copier, CRT and Printer!



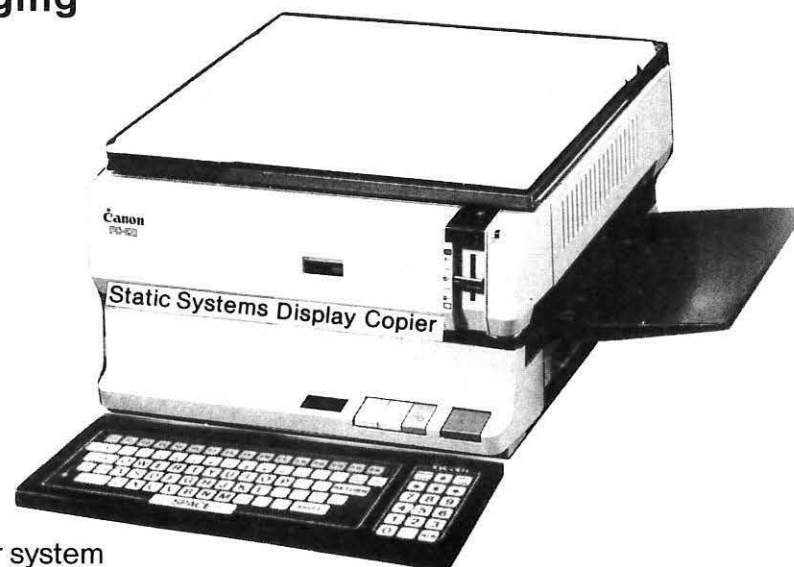
Liquid Crystal Dot Matrix Imaging

The Display-Copier

Copying/printing, cartridge copier



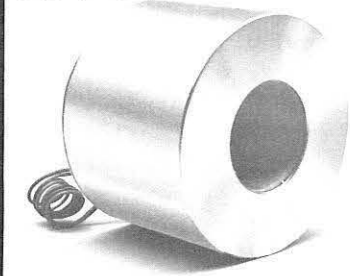
Display in Cover



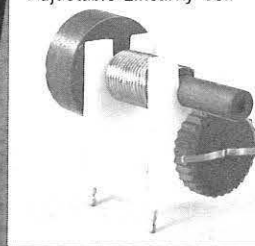
Large Alphanumeric LCD
Copier Imaging
Visual display panel

Keyboard slides under base of copier.
Memory units desired would be equal in either system
Copier converts to printer when imaging the display.

Precision Focus Coil



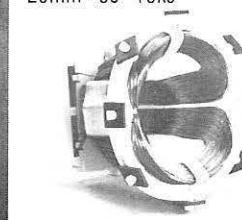
Adjustable Linearity Coil



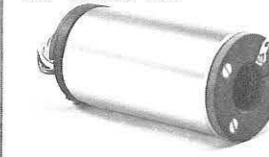
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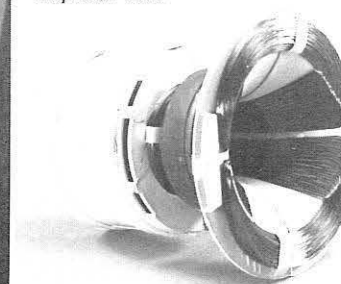
20mm - 90° Yoke



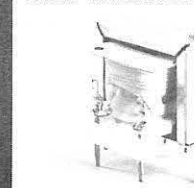
2/3" Camera Yoke



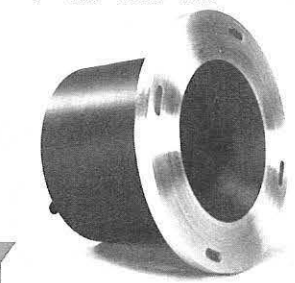
Projection Yoke



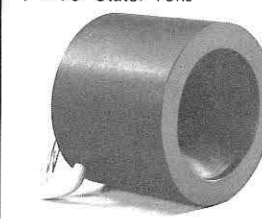
Buffer Transformer



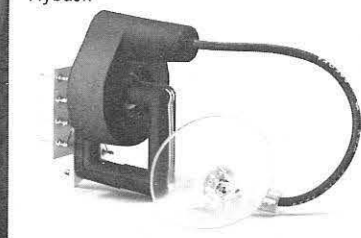
1-7/16" Stator Yoke



1"-70° Stator Yoke



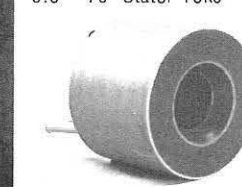
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Reducing Popping into View of Objects and Detail in Area-of-Interest Displays

by Kevin Berbaum, Essex Corporation,
Canyon Research Group, Orlando, FL

Summary

Eye-coupled area-of-interest displays may offer an alternative to more traditional multichannel simulator displays at a fraction of the cost but with the same or better resolution. Developers of any new system must concern themselves with potential limitations of the new devices; a potential issue for area-of-interest displays is "popping." Popping is the compelling phenomenal appearance of new scene content, as it passes from low levels of detail available in the periphery, or background, to the high levels of detail with the area-of-interest.

The results of these experiments suggest that popping will be more pronounced for lower spatial frequencies (larger sizes); that popping depends upon the slope of the temporal onset and offset of the high level of detail material; and finally that popping is more apparent with more frequent changes in level of detail. From these findings we derive recommendations for minimizing popping. These results can also be translated into general principles describing how to make display changes conspicuous or inconspicuous.

Introduction

Visual Display Research Tool, 6.3, funded by NAVAIR, which is targeted for incorporation into the Visual Technology Research Simulator at the Naval Training Equipment Center in 1985, offers a low-cost alternative to traditional, multichannel, wide field of display in the area surrounding the pilot's fixation, and low detail display elsewhere. In this system, two CIG channels are displayed through a helmet-mounted projector onto the interior of a dome screen. One channel is a 20 degree square area-of-interest display; the other channel is a wide field (120 degrees horizontal) background display. The whole display is slaved to the observer's eye, so that wherever the eye is fixated, a high level of detail will be seen. A two-channel display, so constructed, may achieve the effective spatial resolution of a multichannel display but at much less cost (cost determined by the number of CIG channels). This system's designers have been concerned that it may occasion popping into view of objects as the scene layout passes from low to high level detail areas of the display, (1).

The purpose of the current experiments was to investigate the popping phenomena in order to understand the visual mechanisms involved and to recommend methods of stimulus presentation which minimize, or remove, the effect.

One report in the research literature (2) contends that the slope of the onset and offset of a stimulus determines the transient visual system response to that stimulus. Since the transient system is implicated in perception of popping, it is critical to obtain good control over this variable in the current experiments. Therefore, we selected two temporal waveforms: triangular and rectangular. These two waveforms permit the importance of rate-of-contrast change and of frequency-of-contrast change to be determined. In the triangular waveform, onset and offset slope change as a function of frequency; in the rectangular waveform, since slopes of onset and offset are infinite, they are unchanged, regardless of the modulation frequency.

Perceptually, an object, or new detail, popping into or out of view is very different from a steady state object. In attempting to control popping, sensitivity to steady state or ordinary movement is not really the issue. It is the sudden, anomalous, noticeable changes that are not ordinarily present in a scene but which may accompany new area-of-interest displays that are of concern. Thus, the appropriate response measure for the current experiment ought to reflect sensitivity to change, rather than simple sensitivity to stationary pattern. To study this, we invented a response measure: "Popping threshold." Subjects adjusted the peak contrast of the gratings to the point at which an eye-catching or attention-gathering change or temporal discontinuity could just be detected. This point was operationally defined as the popping threshold. The importance of distinguishing between popping threshold and ordinary threshold was apparent from the beginning of the current study. A high contrast, low spatial frequency, low temporal frequency (triangle or sine waveform) stimulus has a well defined spatial structure, but there is no noticeable pop. However, when the contrast of a low spatial frequency, high temporal frequency, grating is set to popping threshold, a pop is conspicuous, even though the spatial structure of the pattern cannot be apprehended.

Stimuli

All stimuli were presented on the viewing screen of the Optronix Vision Tester, which is described elsewhere in detail (3). This screen was 22 cm wide and 29.2 cm in height. The average luminance of the screen was 100 cds/sq. m, and the peak contrast of the patterns was 0.5. Vertically oriented gratings varying rectangularly in contrast were used in these investigations. Stimuli were viewed from a distance of 3 meters measured from the eye. The proper parafoveal eccentricity was maintained by the use of a fixation point off the CRT in these conditions. Subjects fixated a point 12.5 degrees to the right of the center of the Optronix viewing screen, which subtended 4.4 degrees horizontally at the 3 meter viewing distance. Square wave gratings of fundamental frequency (0.16, 0.33, 0.5, 1.0, 3.0, 6.0, 11.4, 22.8 cycles per degree), which were contrast-modulated as a function of time, with either rectangular or triangular waveforms at various rates, were presented. Squarewave gratings were used in this study rather than sinewave gratings, because the former would be more likely to be employed to depict objects having edges and extent, or size. In using squarewave gratings, no assumption is required regarding whether the human visual system can be considered to be linear with respect to space. The temporal waveforms were used to model the change in contrast of material of various sizes crossing the blend region at different rates. Rectangular temporal waveforms of 0.1, 1.0, and 10 Hz were used to model a blend region having infinite slope. Triangular temporal waveforms of 0.1, 1.0, and 10 Hz were used to model material moving across a 5-degree-wide contrast blend region at rates of 1, 10, and 100 degrees per second assuming trough-to-peak contrast change for counter-phase corresponds to change in contrast across the

TTXTM 3003 "Smarter" Terminal from Teletex Communication Corporation, Foster City, CA, is a TTY-compatible terminal with a 24-line by 80-character nonglare 12-inch display screen, 19 programmable functions, two-page screen memory, and N key roll-over.



A ready-to-run package combining OptoMouse, an all-digital optical mouse, with the VisuALL software environment has been introduced by USI Computer Products, Brisbane, CA. VisuALL creates a window interface on IBM PCs, XTs, and compatibles, and supports all PC DOS application programs without modification. With OptoMouse, the user can freely move the cursor anywhere on a video screen and execute commands without use of the keyboard.

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blend region. (Of course, for other blend region widths, the triangular waveforms map into other rates. For example, for a one-degree-wide blend region, the above rates would correspond to 0.2, 2, and 20 degrees per second.)

Procedure

The Optronix 200 Vision Tester permits automated determination of threshold contrast sensitivity for spatial waveforms (gratings) having various spatial frequencies temporally modulated with various temporal waveforms. Subjects used the method of adjustment — adjusting peak contrast to the point at which popping was just noticeable.

The experiment was conducted in blocks, with each block including all spatial frequencies; so that for all subjects, each block included 6 trials. (The lowest spatial frequencies (0.16 and 0.33) were run in a separate block, because a different viewing distance — 1 meter — was required.) The factorial combination of the six highest temporal frequencies and temporal waveform resulted in 6 blocks of trials. The order of blocks was random (different for each subject), but the order of presentation of spatial frequencies within each block was not. Each block of trials required approximately 10 minutes. Several blocks (usually three) were completed in a single session.

Results and Discussion

Results of the experiment are presented in Figure 1. It is dramatically clear that popping declines with increasing fundamental spatial frequency for all functions ($F = 453.46, p < 0.001$). Since the spatial waveform is square, we may also infer that the popping declines with size. Next, consider the order of the functions. If the slope of onset/offset were the sole variable affecting the order of these functions, then we would expect the following:

1. The functions for rectangular temporal waveform (solid lines) would not differ, since they all have the same onset/offset slopes, though they differ in modulation frequency.
2. The functions for triangular temporal waveform (dashed lines) ought to be separated from each other, with level of popping corresponding to modulation frequency (since for the triangular waveform, onset/offset slope is related to frequency).
3. We would expect the highest temporally modulated triangular waveform function to be just slightly below the rectangular waveform functions, because its onset/offset slope approaches those of the rectangular waveforms (infinity).

4. Statistically, we would expect a main effect for waveform and an interaction between waveform and modulation frequency. Results are not in complete agreement with these expectations. Of course, many of the expected relationships can be observed visually in the graph. The overall height of functions seems to depend upon the slope of the change in contrast; those functions with the highest onset/offset slopes overlap, and functions with shallower slopes are correspondingly lower. However, the statistical analysis shows significant main effects for both temporal waveform ($F = 25.71, p < 0.01$) and modulation frequency ($F = 16.25, p < 0.005$), but no statistically significant interaction between variables. This means that while onset/offset slope (a contrast blend region) has an impact upon the noticeability of changes in details, the frequency of changes in detail also affects conspicuity.

The results indicate that popping declines with 1) decreasing size, 2) decreasing onset/offset slope, and 3) decreasing frequency of changes. Several recommendations for eye-coupled area-of-interest displays seem warranted. First, a 5-degree-wide contrast ramp between area-of-interest and immediate field-of-view will tend to suppress popping (this tendency being most pronounced at lower rates of travel of material across the blend region). Second, a restriction upon scene modeling which may be helpful in mitigating popping is to maintain contours between levels of detail which are required for the external borders and to cast shadows of objects. Addition or subtraction of internal contours will produce much less popping. These recommendations are intended to minimize the noticeability of changes in display content. However, the converse of these recommendations may be used in display content to make changes conspicuous and eye-catching (e.g., for warning signals.)

Footnotes

- (1) Spooner, A.M. *Technical Memorandum—File Note, AMS*, 18 December 1981.
- (2) Breglia, D. *Technical Memorandum—File Note, DRB* 12 January 1982.
- (3) Breitmeyer, B. and Julesz, B. "The role of on and off transients in determining the psychological spatial frequency response." *Vision Research*, 1975, 15, 411-415.
- (4) Optronix Corporation. *Optronix Corporation Series 200 Vision Tester. Operating Manual (Software Version 1.0)*. Evanston, IL.

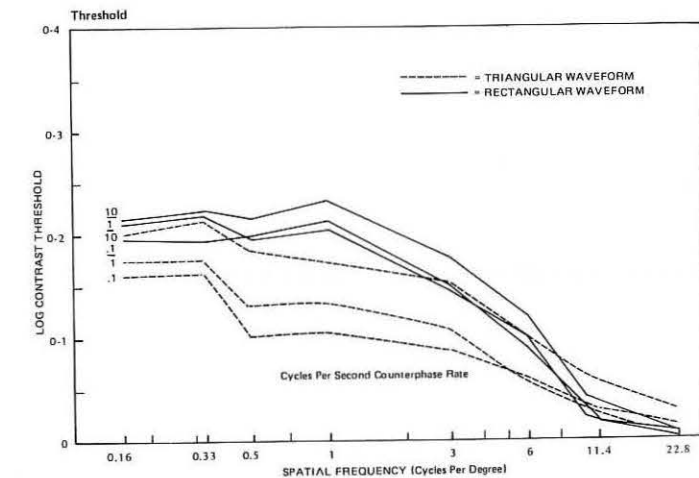


Figure 1. Popping threshold as a function of fundamental spatial frequency.

Chapter News continued from page 20

Dr. James L. Levine, IBM Watson Research Laboratory, described a "Touch Sensitive Plasma Display Panel." He explained how an IBM 581 plasma display panel has been equipped with a laser scanning device. This provides touch input of coordinate data, with the accuracy of a light pen, but without the complications of a special stylus. He also demonstrated the device with examples of graphic and menu-driven programs.

On January 10 a review of the Japan '83 display research conference will be presented by Dr. Ifay Chang, IBM, the SID Vice President. Additional meetings of this Chapter are scheduled for February 14, March 13, April 10, and May 8. Thanks to Chapter Chairman Howard Funk for excellent reports.

MINNEAPOLIS/ST. PAUL CHAPTER held a business meeting in November to plan future technical meetings according to Vice Chairman Tom Werner.

Display Searchlight

Classified Advertisements Now Accepted in Information Display

For the convenience of SID Members and other readers of **Information Display** — there are some 500 libraries that subscribe to our Journal — we are initiating a section each month to provide classified advertising. These ads will be in five categories as follows:

1. Professional Positions Available
Already many major and minor companies have advertised in **Information Display** for scientists and engineers with experience in display technologies. Classified advertising offers a low-cost method to interest competent professional personnel.
2. Professional Positions Desired
A market place is provided at low cost — and with anonymity, if desired, with Box numbers — for those wishing professional employment. Since SID now has some 80 Sustaining Members, organizations large and small in the display industry, the Journal's new Display Searchlight section will help professionals find the kind of work most interesting to them.
3. Consulting Services
This is a suitable place for consultants' business cards.
4. Hardware For Sale
A low-cost method for advertising specialized display hardware is now available.
5. Software for Sale
Offerings of display programs and programmers are welcome.

Rules for Display Searchlight Section

1. The Society for Information Display (SID) reserves the right to refuse advertisements not considered suitable for insertion in the Journal.
2. Rates are \$45 per column inch, with a minimum of 2 column inches @ \$90.
3. Copy for each classified advertisement must be mailed to Communications Printing Corp., 4709-A N. Towne Ave., Pomona, CA 91767 along with a photostat of the check for payment. Closing date is the 3rd of the month prior to the issue month, i.e. February 3 for insertion in the March issue.
4. Payment by check must be mailed to Society for Information Display, 654 N. Sepulveda, Los Angeles, CA 90049, at the same time that the advertisement is mailed to the Journal printer in Pomona. We are simplifying the entire procedure so as to minimize clerical work by eliminating invoicing.
5. An advertising agency discount is paid for display advertisements (1/4, 1/2 and full page ads) placed in the Journal. No discount will be paid for classified advertising. If placed by an agency, the agency must collect any fee from its client (s).
6. Additional information may be obtained, if necessary, by phoning Ted Lucas, Journal Editor, at 714/337-8889.

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To apply, complete the application, enclose membership fees, and mail to the Society.

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Greetings to New SID Members

Every month you'll find a roster of new SID Members, listed by chapters with the Chapters in alphabetical order. If your name — or a friend's — should have been listed and was inadvertently omitted, please let Bettye B. Burdett or your Editor know immediately. We'll make amends in the next issue. Additional new SID Members will appear in the March issue.

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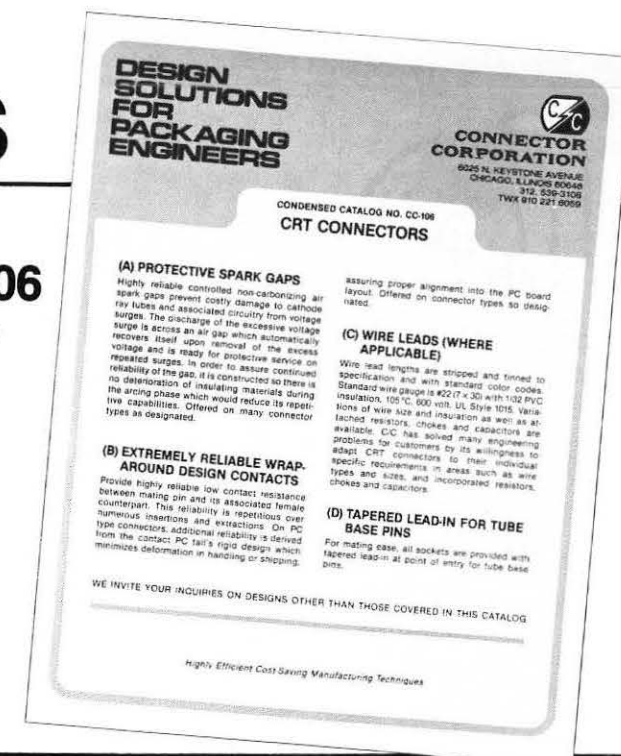
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Tymshare, Inc., Cupertino, CA, recently announced new features for its Scanset XL personal information terminal, including increased speed to 1200 baud, downline loading capability for the directory, status, and 12 function keys, and the optional inclusion of an RS232-C interface, which allows the terminals to be connected directly to a computer with automatic, one-button telephone dialing and automatic log-in. Special subscriptions to the Dow Jones News/Retrieval Service (R), CompuServe, and Comp-U-Store are included with the purchase of any Scanset terminal.



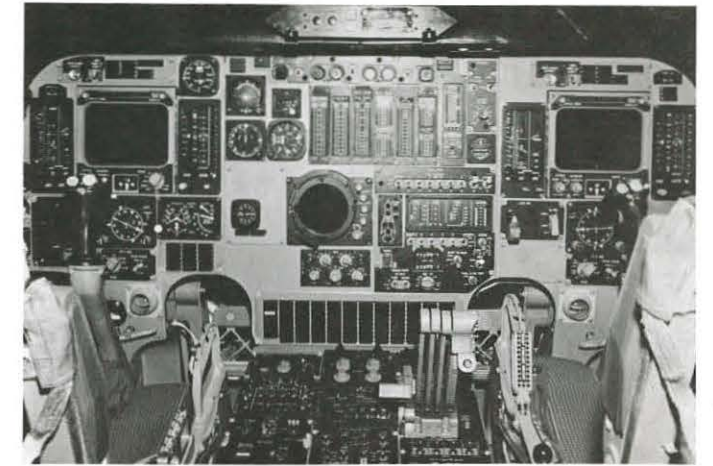
The Logical L-XT, the first IBM compatible microcomputer to utilize the Logical Natural Language, was introduced by Logical Business Machines, Sunnyvale, CA, at COMDEX/Fall. The Logical Natural Language helps users, with or without programming experience, to develop customized business applications using everyday nouns and verbs.

Please be sure to notice the perforated insert in this issue. We want your help in enlisting more SID Members and getting classified ads.



This compact Polaroid Palette computer image recorder connects to personal and small business computers for producing presentation-quality computer graphic images on new Polaroid 35mm Autoprocess transparency films. Compatible with several existing graphics software packages, Palette allows even monochrome-display computers to be used for making color hard copy.

In the Driver's Seat of the B-1B



The complexity of the nation's newest strategic bomber, the B-1B, is obvious from this cockpit photograph provided by Rockwell International, builder of the aircraft for the U.S. Air Force. Cubic Corporation Defense Systems Division of San Diego won an \$8.3 million subcontract from Rockwell to produce maintenance trainers for the B-1B. Full scale, the simulator will duplicate the cockpit as well as other major aircraft subsystems.

Coming Features

February: Multicolor electrochromic flat panel displays.
March: CRT Displays on the space shuttle.

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Internal Schmidt Projection CRT's

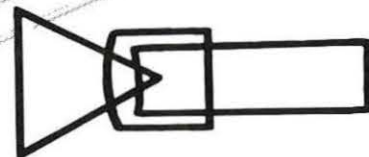
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Ebasco Advances Earthquake Prediction with CAD

As a result of recent seismic studies around Mount St. Helens, Ebasco Services Incorporated, New York City, international engineers/constructors, has announced a major breakthrough in earthquake analysis — the use of a CAD system to explore the causes and patterns of earthquakes and to help forecast their occurrence.

"Such an advancement in the state of the art helps answer both federal and state demands for increased safety from earthquake damage in the design and construction of dams, power plants and major public works," said Joseph L. Ehasz, Ebasco's chief civil engineer. "Analyses using the CAD system can now provide more realistic estimates of the probability of earthquake occurrence and maximum impacts, which, in turn, can help improve project design and potentially reduce construction costs. Furthermore, when presented to clients and regulatory agencies, CAD's impressive display capability can provide direct support for conclusions of seismic analyses."

In the Mount St. Helens region, CAD findings distinguished between earthquakes which were fault-related and those which were related to the actual volcanic eruption. More specifically, CAD clearly showed the onset and increase of earthquake activity in the months prior to the major eruption on May 18, 1980. Repetition of this same seismic pattern, Ebasco concluded, could be a prime indicator of future activity.

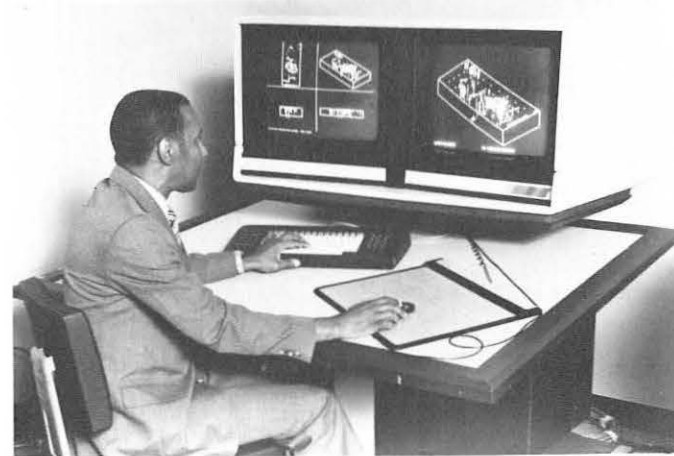
Compared to the traditional method of paper-plotting earthquakes, the CAD system enables analysis in seconds of what used to take days. Around Mount St. Helens, where over 5,000 earthquakes were recorded between 1978 and early 1983, five dimensions of information were gathered about each quake: date and time of occurrence, magnitude (Richter scale), and latitude, longitude and depth of the hypocenter (shock). With each dimension color-coded and entered in the CAD system, display capabilities in plan, profile and isometric (3D) views allow interactive sorting and plotting using all five dimensions at once. As a result:

- Earthquakes can be displayed chronologically as earthquake "movies" allowing Ebasco earth scientists to view space and time relationships between events: i.e., those subtle patterns which provide important information about mechanisms of earthquake generation, migration of earthquake locations over time, and relationships of smaller earthquakes to larger ones.
- Three dimensional capability outlines fault planes where earthquakes have occurred. A chronological display of a particular fault can show the migration of events with time to different areas and depths along the fracture, thus yielding new insights into faults and how earthquakes behave.
- At any time, plots can be printed out at any scale and size to overlay topographical and geological maps, aerial photos, and satellite and radar images. Such overlays enable earth scientists to correlate the earthquakes to known or suspected geologic features on the ground and to identify areas requiring detailed field investigations.

In addition to the Mount St. Helens study, Ebasco has also used the CAD system to study earthquakes in the eastern half of the U.S. from the mid-1500s to the present, including the Oct. 7, 1983 earthquake in the Adirondacks which registered 5.2 on the Richter scale. Unlike the West

Coast, where earthquakes occur along well-defined fault planes, the study confirms that eastern quakes appear in scattered clusters.

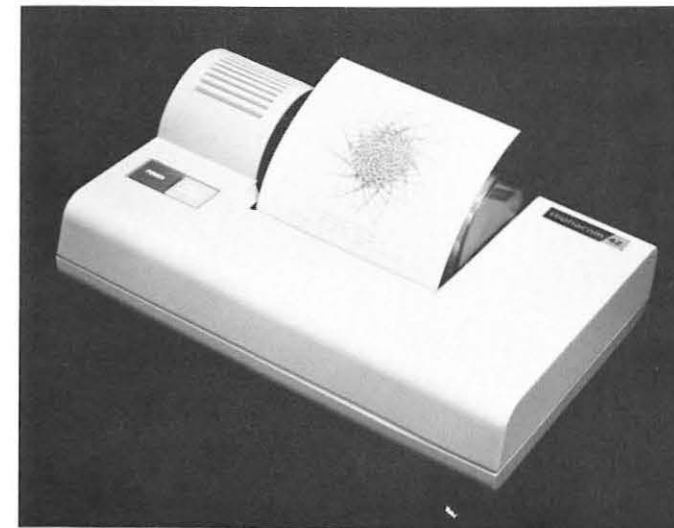
The Ebasco CAD system consists of Intergraph work stations with color capability driven by PDP and VAX computers. In addition to the earth sciences area, Ebasco Mechanical, Electrical and Civil Engineering Departments, as well as Instrumentation & Control, Facilities Management and multidiscipline functions, also use the CAD system.



For the earthquake analysis of the Mount St. Helens region, Ebasco's CAD system provides display capabilities in plan, profile and isometric views and allows interactive sorting and plotting, using five dimensions of information about each quake.



The new System 2000, 16-bit microcomputer from Monroe Systems For Business, Morris Plains, NJ, features the Intel 80186, a 16-bit CPU. This microcomputer comes complete with two industry standard operating systems, MD-DOS and CP/M-86 DPX.

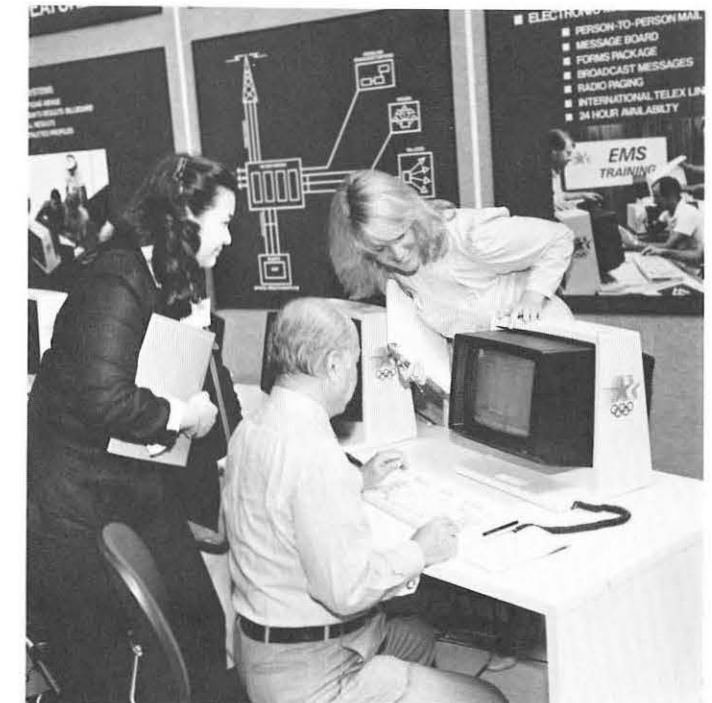


This Alphacom 42 "universal" printer is said to be ideal for use with home computers such as those from Commodore, Atari, and Texas Instruments. It prints at two lines a second and combines a single-chip microprocessor, and Olivetti print mechanism using advanced thermal technology, and a light-weight, impact-resistant, award-winning enclosure. Alphacom Inc. is located in Campbell, CA.



This new Apricot 4th-generation, 16-bit personal computer offers professionals a complete, ready-to-work environment, including a system manager that simplifies the operating system, 256 Kbyte IBM-PC compatibility, and a Microscreen™ — a two-line LCD built into the keyboard. Maker is Applied Computer Techniques (ACT), largest microcomputer company in Great Britain.

Olympic Communications Network



Members of the International Olympic Broadcast Committee, representing a world wide audience of more than one billion television viewers, were introduced recently to Western Electric's Electronic Messaging Service (EMS) at the XXIII Olympiad headquarters in Los Angeles. Developed for the 1984 Los Angeles Olympics, EMS is one of the largest area communications networks ever devised. It will provide easy access to event schedules and results and athletes' profiles as well as links to radio paging services and the international telex network.

The system will be especially helpful to the more than 50,000 members of the Olympics family next year because of the scattered Olympic venues over a 4,000 square mile area in greater Los Angeles. EMS will provide event results at over 60 event locations within a minute after official results have been certified and released. Athletes and coaches will use EMS to schedule meetings, send and receive messages, reserve practice facilities and request a variety of services from the Los Angeles Olympics Organizing Committee.

A new fiber optic lightwave system will connect the 23 Olympic sites. Laser-generated light pulses can handle voice, video and data transmissions over the same glass fiber simultaneously. Western Electric and its Teletype Corporation subsidiary are official telecommunications sponsors of the 1984 Los Angeles Olympics.

Thanks, Chapter Chairman

Some SID Chapter Chairmen have responded nobly to your Editor's pleas for Chapter technical meeting information and pictures of happy, enthralled SID Members and guests. To them, thanks! To the others, a hope you'll do better in 1984.

MODEL 801CE



COLOR SYSTEMS GENERATOR

Now you can bring all of the signal generating power of our popular Model 801C under direct computer control. Introducing the Model 801CE Color Systems Generator.

FUNCTIONS

APPLICATIONS

- Computer controlled testing of O.E.M. CRT displays.
- Automatic Alignment of CRT displays.
- Mass storage and distribution of test signal formats (in the lab and on the production floor).
- Remotely control custom designed signal buffers and control panels (using the Interflex Bus™).

FEATURES (in addition to those provided by the Model 801C)

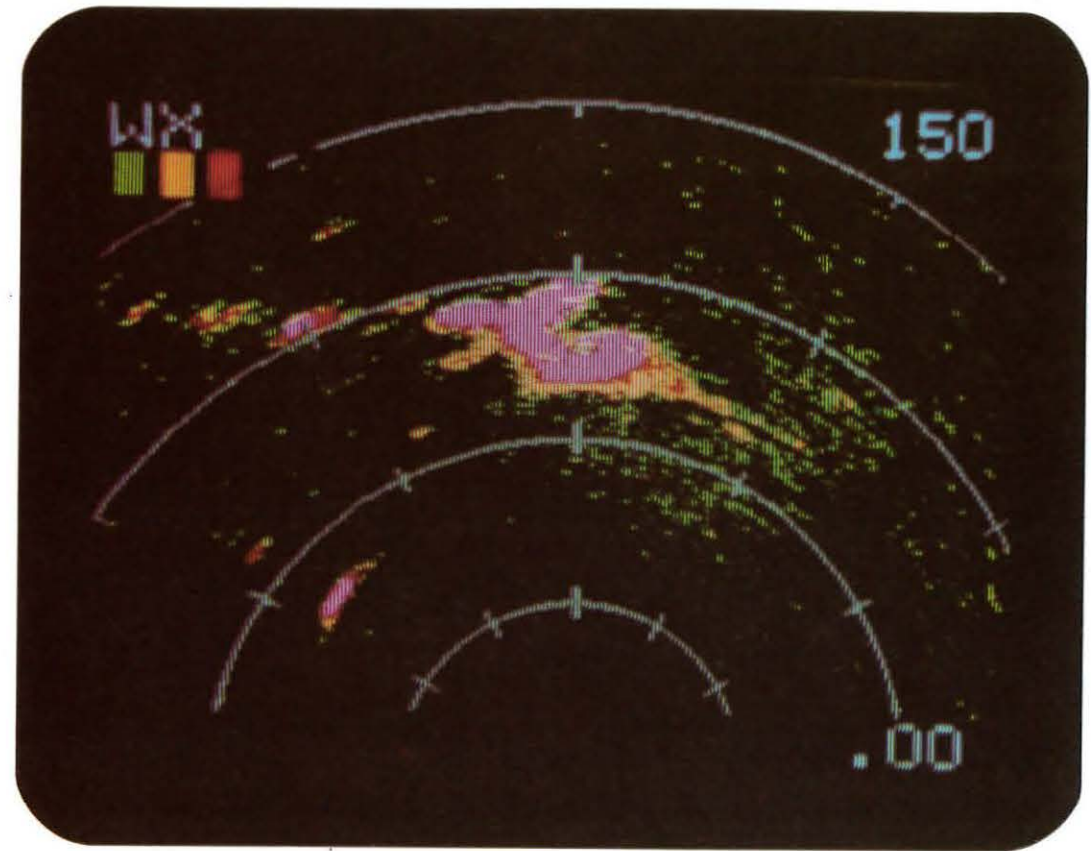
- A computer interface to the world standard IEEE-488 General Purpose Interface Bus (GPIB).
- A computer interface to Quantum Data's Interflex Bus™. Allows the direct attachment of custom-designed devices at very low cost.
- Easy-to-use commands that allow you to program your own custom patterns.
- Thirty four (34) additional color patterns.

FEATURES (in common with the Model 801C)

- Sixteen (16) selectable color patterns.

- Two-level grey scale for color tracking measurement.
- Five selectable monochrome patterns (including crosshatch).
- Character set containing 64 characters.
- Four (4) custom user define characters.
- Up to 256 characters/row by 128 character row/frame (includes blanking).
- Interlace and non-interlace modes.
- Negative video capability.
- Non-volatile CMOS memory stores and recalls 3 color or monochrome formats.
- Internal frequency synthesizer for variable dot clocks with crystal accuracy.
- Programmable dot clock range of 1.024 to 32.768 MHz color, 1.024 to 65.520MHz monochrome.
- Both video and sync timing are entirely programmable by the user.
- Automatic frequency calculation from entered parameters.
- Error messages to help identify invalid format entries.
- Resident performance check formats.

NOW YOU SEE IT...



WXR-700 Weather Radar, Manufactured by Collins Air Transport Division, Rockwell International Corp., Contrast Enhancement Filter Patent #4,245,242.

BETTER.

Better CRT Contrast Enhancement From Schott.

Schott Optical's contrast enhancement filter glass types create a dramatic effect regarding the improved readability of CRT displays in high ambient light environments. These glass types, developed and produced in Schott Optical's Duryea, Pa. facility, provide unmatched readability under full sunlight cockpit conditions. Schott Optical's contrast enhancement filter glass types are available for full color and penetration phosphor type displays. There is also a filter type developed specifically for displays utilizing CRTs with P-43 phosphors.

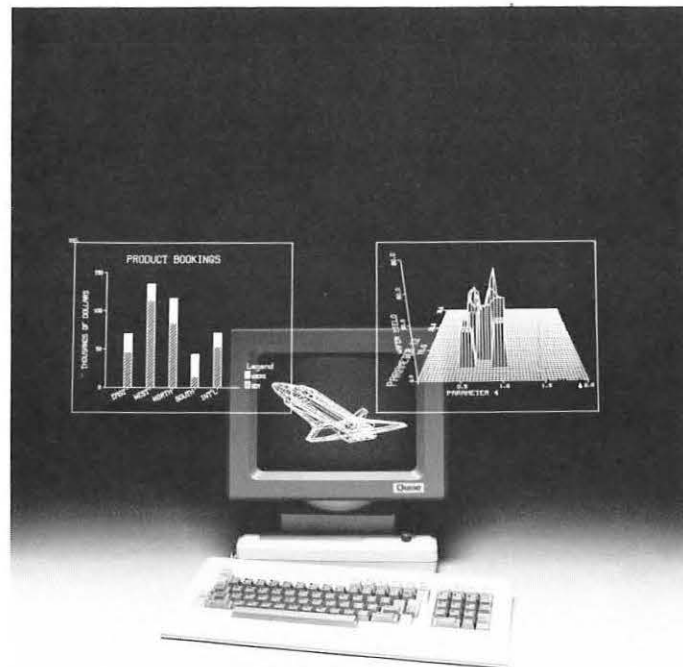
Schott Optical supplies its contrast enhancement filter glass cut to size, ground and polished. All contrast enhancement filters may be hardened and coated easily with both antireflective and conductive coatings.

For visibility problems in critical CRT displays, Schott Optical's contrast enhancement filter glass is the superior solution. Contact Schott Optical today!



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This new nine-user networking Altos 986 supermicro, a 16-bit, 8086-based system, runs the Xenix operating system, and competes directly with minicomputers in the business environment. The maker is Altos Computer Systems, San Jose, CA.

Happy New Year!

Remember that each SID Chapter officer (1 per Chapter) who sends in reports on Chapter technical meetings, earns \$35 per report for his chapter. Plus \$5 per published picture in the Journal.

Capable of three-dimensional engineering design, the QVT 211 GX graphics terminal made by Quine Corporation, San Jose, CA, is another recent entry into the field of 3D business and engineering graphics.

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