

Chapter News

MINNEAPOLIS/ST. PAUL CHAPTER—Thanks to our reliable friend, Vern Born, Director of SID Central Division, we have another picture of a happy group at a chapter meeting. Vern took this picture in November and sent it to your Editor with an amusing letter penned while flying back to the Twin Cities from New York: Dateline, Over Lake Erie 5 p.m., January 16, 1981. The weather was apparently rough enough so that Vern rated his chances of making the SID meeting that evening at 50%. Our hero did it, and enjoyed the demonstration at National Weather Service. In a report on this meeting approved by Russell E. Ingvaldsen, Chapter Treasurer, and prepared by Will Haller, Secretary, 27 SID Members and guests saw a computer display of weather data including 200 square mile grids covering the entire U.S. Dale Branch, meteorologist in charge of man-machine interface and electronic computer display at NWS, was the speaker.



At CPT Corp, about half the group of SID Members and guests from MINNEAPOLIS/ST PAUL Chapter who attended an interesting meeting in November 1980.

DELAWARE VALLEY CHAPTER on January 29 was treated to a talk by Dr. Derick Jones of Electronic Display Systems, Hatfield, PA. Topic was "Liquid Crystal Displays",

and 25 attendees enjoyed demonstrations at EDS plant in Hatfield. Thanks to C.P. Halsted, Chapter Chairman, and N. Rubin, Chapter Secretary, for regular information on SID meetings in your area!

LOS ANGELES CHAPTER has had exceptionally good SID meetings during this 1980-81 period, thanks to Gordon Kramer, Program Chairman. Gordon is also prompt about supplying data to your Editor for this page. Oh, that there were more like him . . . On February 25, SID Members enjoyed a tour of the control tower at LAX (Los Angeles International Airport), one of the world's busiest airports as most SID travelers know. Ivan Hunt of the tower staff guided SID Members and guests through the facility, described the display systems used for air traffic control, provided some classroom instruction for our numerous flying buffs, and led the large group to the LAX radar tracking facility, TRACON. Hunt was a most entertaining host, dealing with topics interesting to practically every SID member.

SAN DIEGO CHAPTER news is as reliable as the rain on the plain in Spain, thanks to George Unangst. (He not only collects bucks, he's willing to spend 15¢ frequently to send Chapter News to June Friend or me. Only the news comes in bunches, like bananas.) On December 16, the SID group went to world-famous San Diego Zoo in Balboa Park and enjoyed a discussion on "Special Photographic Techniques—How Zoo Animals Are Photographed" by B. Green of the zoo staff . . . R.W. "Bob" Netting, marketing manager of the Reuben H. Fleet Space Theater and Science Center, Balboa Park, provided a fascinating film, lecture, and tour of the facility for a large SID group on January 21. One feature described and displayed was the use of pinhole apertures for planetarium projectors . . . Then on February 10, Dr. William V. Smith, manager of the laser laboratory, and Terry Bochanty, marketing representative, both of DiscoVision Associates, Costa Mesa, presented an excellent program. The principles of the optical disc technology developed by MCA DiscoVision (now DiscoVision Associates) and Phillips were described.

INFORMATION DISPLAY

MARCH 1981

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Collection of Magnetic Shields for encapsulating various sizes of CRTs is shown with Richard D. Vance, president, Ad-Vance Magnetics, Inc., Rochester, Indiana. Shield fabrication involves deep drawing, metal spinning, and heliarc and spot welding. Materials range from 0.025 to 0.062 AD-MU-78 high permeability shielding alloy.

A unique CRT shield with support mounts and terminals is in SID member Rick Vance's hand. The accompanying article beginning on page 3 discusses protection against the earth's magnetic field, denser packaging problems, unexpected hidden hazards to equipment performance in modern construction, solutions to certain CRT shielding problems, and the pros and cons of low cost "instant" CRT shields made of foil.

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

Magnetic Shielding . . . Continued from page 3

Unexpected Hidden Hazards in Modern Construction

A firm moves proudly into its new reinforced concrete building. Equipment is set up and ready for use. But magnetic interference that seemingly defies tracing prevents optimum functioning of equipment. There was no such problem with identical equipment in the old building. Laboratory researchers and production technicians can't understand why the problem exists in the new building.

Typically, the hidden answer may lie in lower ceilings which contain more reinforced steel beams. Those lower ceilings bring nearer to sensitive equipment the performance-affecting magnetic fields which are generated by the steel beams. The older structures were constructed with higher ceilings; therefore the offending fields were farther away, so interference was less. Magnetic field gradients much more than the typical 150 Gamma/cm of the high ceiling structures are often present in low ceiling reinforced concrete buildings.

Thus, while a magnetic radiation source is frequently apparent, even obvious, it can also be difficult to trace. In any event, magnetic shielding for sensitive equipment in low ceiling reinforced concrete edifices is imperative. Otherwise, there is continuing excessive disturbance in such newer buildings, preventing research or production equipment from operating at desired resolution levels when the equipment is not packaged to function in such an inhomogeneous environment.

CRT Shielding Problems - The Magic Number is 0.2

The design stage is the foolproof time to realize the possible future need for a magnetic shield and to allow enough area for a shield in the design itself. Too often this possibility is not considered, causing later complications with suboptimum performance and even customer dissatisfaction. Trying to cram the required magnetic shield into the too-small area available won't work. So a less effective shield that does fit into the available area is a familiar compromise attempt at a solution. Of course the less effective shield helps but cannot fully block out the magnetic fields interfering with top CRT performance.

The proper solution is to design in sufficient clearance around the neck of the CRT to permit placing of a shield system. A two cylinder system generally gives the optimum static field shielding effectiveness per unit of weight when the outer cylinder diameter is 1.414 times the diameter of the inner cylinder. Thus when ventilation is not required, and the inner shield cylinder fits closely around the neck glass, a clearance slightly greater than 0.2 times the neck diameter would be the typical clearance to be designed into the shielding system.

Some CRT Shielding Examples

In this example, the problem was to design and manufacture a CRT magnetic shield that would meet three basic requirements. These were: to shield the neck portion from detrimental local magnetic fields; to provide adequate structural support for the tube; and to achieve shielding at a cost lower than for the usual CRT shield. Cost was an urgent consideration because a large number of shields was needed.

As illustrated in Figure 2, the final design was based on skillfully combining magnetic with nonmagnetic materials. By actual experiment, it was determined that a cylindrical structure of 0.020" thick high permeability alloy around the magnetically critical neck area provided all the shielding needed for good resolution. The 0.020" thickness was chosen because it provided the needed safety against saturation. Furthermore, the alloy selected assured maximum permeability and minimum shock sensitivity. It was

then possible to utilize a lower cost 0.031" thick nonmagnetic stainless steel for the desired structural support for the forward part of the shield. As both the shielding alloy and the stainless steel have similar coefficients of expansion, annealing the final assembly presented no problems.

Combining the shielding alloy with the stainless steel was accomplished by spin reducing one end of the larger cylinder to mate with the smaller neck cylinder. Structural rigidity was enhanced and fracturing eliminated by incorporating generous radii. A mounting flange was heliarc welded to the outer perimeter of the larger cylinder's open end. The shielding alloy cylinder and the spun section were then pressed together and permanently located by a series of spot welds in the overlapping area.

To optimize the cylinder's magnetic shielding characteristics, the assembly was given a complete anhydrous hydrogen atmosphere anneal. Because of the shielding alloy's relatively stable permeability characteristics, further annealing was not necessary. Finally, an attractive glossy baked enamel finish was applied to match the finish of the surrounding hardware.

When subjected to a directed 60 Hz magnetic field normal to the cylinder's axis, the neck portions of a group of shields showed attenuation ranging between 47 and 55 db (voltage ratio).

In testing, the radiation source originated from a soft iron pole approximately 3/8" in diameter by 3" in length located in the center of a solenoid winding of sufficient impedance to prevent overheating during a maximum 5-minute period of excitation. The structure was physically positioned with the pole normal to the shield's axis and approximately 1/4" from the shield cylinder's outer surface and centrally located along the length. Input current was Variac controlled. A thin Hall probe measured the flux density impinging on the shield's surface directly in line with the pole structure. This level was set in the 3 to 5 gauss range. Then the flux within the shield was measured, locating the same probe on the shield's axial center, orienting it for maximum response. The resultant ratio of these two measurements was noted in terms of decibel attenuation.

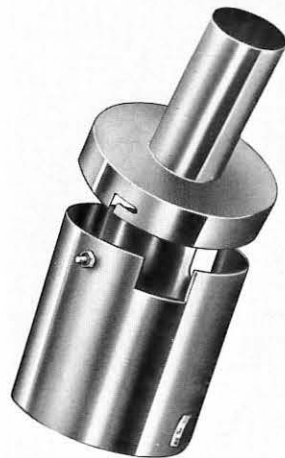


Figure 3

Figure 4



Magnetic Shielding . . . Continued from page 4

In another example, illustrated in Figure 3, the problem was to provide an effective, economical, and simple structure for shielding a CRT's deflection yoke and neck, thereby eliminating the need for a larger, more costly and complex magnetic shield covering the entire CRT. Fast, easy access to the yoke assembly was also specified.

Figure 3 illustrates the 2-section shielding structure fabricated from a single high permeability alloy 0.025" thick that fulfilled all the requirements. The specified quick and easy access to the yoke assembly was provided by a removable slip-on-and-twist cover. A threaded stud welded to the outside of the cylinder section fits into an L-shaped slot in the overlapping flange of the cover and is locked by drawing down the nut. Tests made on the shield only in an anticipated low level magnetic field indicated attainable attenuation ranging from 45 to 50 db. No finishing was required after fabrication, as the chosen shielding alloy offered adequate resistance to the operating environment. Furthermore, the alloy selected would not saturate when properly used nor suffer excessive degradation of permeability from shock. In addition, it displayed minimal retentivity for its given permeability.

The open-ended cylinder portion of the 2-piece shield assembly is 4" long by 3-5/8" ID. Inside, the deflection yoke is concentrically located and held in place by epoxy bonding. A rectangular cutout gives additional access when the cover is off. Cable entry is through an obround notch. Grounding is achieved by two tabs welded to the cylinder near the open front end. In the cover portion, a concentrically located welded 3" long tubulation completes the shielding of the neck. All seams are heliarc welded for maximum performance.

After fabrication, the shield is anhydrous hydrogen annealed to optimize magnetic shielding characteristics and to provide needed stability to avoid repeated time consuming and costly annealings.

A third example concerned designing and building a magnetic shield for 16" CRTs or memory tubes that can be used in areas subjected to shock and vibration and still deliver top performance shielding. Figure 4 shows such a shield for a complex radar system in a series of consoles. The main shield is on the table, the conformal cover in the model's right hand, and the aluminum bezel in her left hand.

Maximum protection against mechanical shock and vibration even in rough sea or mobile ground applications is provided by potting the tube in a resilient material within the shockmounted rugged dual-layer shield. Convenient access for periodic yoke adjustments is achieved through four rectangular holes 90° apart cut at the narrow end of the square-to-round transition. When operational, these holes are shielded by a removable conformally formed cover positioned and secured by tightening two screw clamps.

Despite exposure to wide variations in external magnetic environments, control tests determined that 43db minimum attenuation was held with approximately 5 gauss impinging on the shield plane. Operationally, widely varying exposure includes degaussing fields and radiating fields from neighboring associated electronic equipment such as power supplies, power carrying service ducts, etc., aboard ship.

Uniformity of performance is checked by measuring the attenuation actually achieved by the heat-treated shield. Good repeatability of tests is assured by use of a Helmholtz coil pair to apply a 60 Hz field perpendicular to the shield's axis. This coil pair is driven by a measured current. A calibrated AC magnetic field probe is positioned by a boom inside the shield, on its axis and parallel to the applied external field, i.e., in line with the axis of the Helmholtz system.

The 3-5/8" wide forward section of the basic rectangular shield has a high permeability alloy inner shielding layer 0.040" thick and a high permeability alloy outside overlay 0.050" thick. This assembly is fusion heliarc welded per MIL-W-8611 to the transition section, which terminates cylindrically to mate with the neck section. This section is made of high permeability alloy 0.062" thick as the shielding material. The final neck section uses high permeability alloy 0.062" thick shielding material.

Four U-shaped stainless steel channels are positioned at each radius corner parallel to the shield's axis and vertical to the plane of the open end, reinforced using fitted gussets with the shield's tapered section. These plates and gussets are heliarc welded to the shield per MIL-W-8611.

Four flanges formed at right angles extend outward from the shield's open end to facilitate attachment of the embossed aluminum bezel. Bracketry is 1/8" stainless steel. The complete unit is formed over solid aluminum plugs.

After fabrication and fitting, the entire shield, except for the aluminum bezel, was subjected to an anhydrous hydrogen anneal to maximize the high permeability alloy's magnetic properties. The shield and tube assembly were then mounted inside the console by attaching to the U-shaped stainless steel channels.

Low Cost "Instant" Foil CRT Shields

In an emergency, or during experimental work, or when time is a factor, a ductile shielding foil shield may be used as illustrated in Figure 5. It can be cut and hand-shaped in moments to the exact contour required. It is wise to have on hand a modest quantity of both low and high permeability ductile shielding alloy foils. They can be ordered from any reputable shielding manufacturer and are delivered already heat treated, ready for immediate use. If one layer doesn't solve the radiation problem, as many more as are needed should be cut and added.

Shielding foils can save not only time, but cost, as they eliminate the designing and tooling charges of prefabricated shields. Foils are also ideal for hard-to-get-at places as well as for emergency or experimental work. They can do away with delays and possible costly downtime.

The foils are not without limitations, assuming electrical insulation between layers and proper grounding at a single point for each layer. Generally, their advantages are confined to situations requiring relatively small numbers of shields. In large volume, the economics indicate prefabricated shields.

Figure 5



GREETINGS TO NEW SID MEMBERS!

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

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**TAB Products Markets
Smart Terminal**

TAB Products Co., Palo Alto, CA, has introduced a new editing CRT display terminal, the TAB 132/15. Developed by the company's electronic office products group, this terminal features a 15-inch, non-glare, high resolution screen, 80 or 132 column format, 7 x 11 dot matrix characters in a 9 x 14 or 9 x 16 cell, screen-labeled soft keys, and English language prompts for set up and operation modes.

"One of the strongest features," says Robert J. Stroh, electronic office products director of marketing, "is the eight soft keys. These keys put over 100 functions, some of which are user programmable, at the operator's fingertips. "The TAB 132/15," Stroh says, "is designed specifically for the operator. English (or other) language prompts lead the operator through set up and operation modes. There is no need to learn 'computerese' or to refer to detailed manual instructions.

"Features such as bidirectional smooth or jump scroll, horizontal scroll, split screen, communications speeds to 19,200 baud, four pages of display memory, a fully displayed status line, make the TAB 132/15 suited to almost any application.

"To our knowledge," claims Stroh, "the TAB 132/15 is the first fully featured smart terminal on the market in its price range."



The TAB 132/15 Smart Display Terminal features a 15-inch, high resolution, non-glare screen, with 80 or 132 column format. Large, flicker-free characters are formed by a 7 x 11 dot matrix in a 9 x 14 or 9 x 16 cell. Character attributes include blinking, bold, underline, reverse video. Protected fields may be based on any attribute.

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In addition to marketing the terminal directly through the TAB sales offices, the company will sell through distributors, original equipment manufacturers, and systems houses.

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SID CALENDAR MARCH TO SEPTEMBER 1981

1981		
April	1	Proceedings, Volume 22, No. 2, 1981, Mailed
	6	National Ballot Return Deadline
	20	Quarterly Mailed
	20	Executive Committee Meeting
	27	National Board Meeting, New York, NY
April	27	SID 1981 International Symposium
May	1	Grand Hyatt Hotel, New York, NY
July	1	Proceedings, Volume 22, No. 3, 1981, Mailed
	20	Quarterly Chapter Rebates Mailed
September	16-18	Eurodisplay 81 — The First European Display Research Conference, Munich, Germany

OTHER EVENTS

1981		
March	23-24	Office Automation Conference, Houston, TX
	24-27	Printemps Informatique (DEP exhibition), Paris, France
May	4-7	National Computer Conference, Chicago, IL
	4-7	Personal Computing Festival, Chicago, IL
June	17-19	International Conference on Optical Radiation Measurements of Fluorescent and Retroreflective Materials, Minneapolis, MN
	18	20th Annual ACM Symposium (NBS and ACM), College Park, MD
	24-26	Computer Industry Trade Expo, Atlantic City, NJ
August	17-22	5th International Congress of Cybernetics and Systems, Mexico City
	24-28	SPIE Annual International Technical Symposium & Exhibit, San Diego, CA
	26-29	National Small Computer Show, New York, NY
November	1-4	DPMA's 30th International Conference & Business Exposition, San Francisco, CA

Call For Nominations Of Candidates For The 1982 SID Honors And Awards

The SID Honors and Awards Committee is soliciting your help in nominating qualified candidates for Fellow, for the Frances Rice Darne Memorial Award, and for Special Recognition Awards. General qualifications based on the SID Bylaw requirements for honors and awards are given below.

(1) FELLOW

The grade of Fellow is one of unusual professional distinction conferred by the Board of Directors, acting on the recommendation of the Honors and Awards Committee, upon a *SID member* of outstanding qualifications and experience as a scientist or engineer in the field of Information Display. The candidate shall have made a widely recognized and significant contribution to the advancement of the field. The nomination must be supported and signed by at least five members in good standing.

1982 Guidelines For SID Honors And Awards Nominations

Nominations for SID Honors and Awards should be concise, but they *must* include the following information, preferably in the order given below.

- (1) Name, Present Occupation, Business and Home Address, and SID Membership Grade (Member or Fellow) of Nominee.
- (2) Award being recommended: (a) Fellow*, (b) Francis Rice Darne Memorial Award, (c) Special Recognition. *Fellow nominations must be supported and signed by at least five SID members.
- (3) Proposed Citation — this should not exceed thirty words.
- (4) Name, Address, Telephone Number, and SID Membership Grade of Nominator.
- (5) Education and Professional History of Candidate—Include college and/or university degrees, positions and responsibilities of each professional employment.
- (6) Professional Awards and Other Professional Society Affiliations and Grades of Membership.

(2) FRANCES RICE DARNE MEMORIAL AWARD

The Frances Rice Darne Memorial Award is awarded periodically, but not more than once each year, to a *Society member* for an outstanding technical achievement (as opposed to teaching, publication, or service) in, or contribution to, the display field. The award is made by the Board of Directors acting on the recommendation of the Honors and Awards Committee.

(3) SPECIAL RECOGNITION AWARDS

Special citation awards are given to members of the technical and scientific community, not necessarily SID members, for distinguished and valued contributions to the Information Display field. These awards may be made for contributions in one or more of the following categories:

- a. Outstanding technical accomplishments.
- b. Outstanding contributions to the literature.
- c. Outstanding service to the Society.

Nominations should comply with the 1982 Guidelines for SID Honors and Awards Nominations, and they should be submitted to the Honors and Awards Committee Chairman at any time during the year, but no later than June 30, 1981.

(7) Specific statement by the nominator concerning the most significant achievement or achievements or outstanding technical leadership which qualifies the candidate for the award. This is the most important consideration for the awards committee, and it should be specific (citing references when necessary) and concise.

(8) Supportive material: Cite specific evidence such as patents, publications, SID activities, other technical and/or professional society activities, evidence of outstanding leadership, etc. *Please be specific and concise.* Cite material that directly supports the citation and statement in (7) above. Limit the evidence to the most important patents, publications, or service — do not generalize.

(9) References: Fellow nomination *must* be supported by the references indicated in (2) above. Supportive letters of reference will strengthen the nomination for any award.

Send the complete nomination—including all the above material—to the Honors and Awards Chairman by June 30, 1981.

I. Reingold, Chairman
 SID Honors and Awards Committee
 USA Electronics Technology
 & Devices Laboratory, ERADCOM
 DELET-B
 For—Monmouth, NJ 07703
 Phone: 201-544-5740



Intelligent Copier Using Liquid Crystal Dot Matrix Imaging For Printing

Shown here from Static Systems Corporation, New York City, is a photograph of the first liquid crystal printing intelligent copier. Any RS232 plug serial or parallel display computer type or word processing terminal may be plugged into the copier up to a maximum of 16 units with collator. The copier shown is the EP310 self-diagnostic electronic copier made by Minolta. This has a Static Systems Corporation liquid crystal imager made by Hitachi, with upper-lower case single-line page width display of 80 characters. The mounted imager display box on the copier where the cover would normally be also contains a strobe unit flashed every tenth of a second and synchronized to the speed of the liquid crystal display, which is 100 milliseconds. This is equal to 10 lines per second or four to five seconds for the average page.

According to SID member Bob Lester, president of Static Systems corporation, the liquid crystal speed is synchronized to the drum speed of the copier. The purpose of the strobe light is to illuminate the liquid crystal matrix display prior to the change, preventing any blur such as would occur if a continuous light source were left on between changes due to the slowness of the display. However, direct-driven dot matrix liquid crystals of high speed (less than one millisecond on-off) will be available later this year, eliminating the strobe light and allowing the use of the fastest copy machines available.

Looking ahead to the next few years, the inventor expects that full screen (page size) for graphic quality allowing any style of font will be available for imaging, eliminating the scrolling of the single line alphanumeric dot matrix LCD.

Liquid crystal imaging provides solid state graphics at very low cost and with exceptionally low power requirements. Liquid crystal image printing is another new method to be added to the list, such as lasers, fiber optics, thermal, inkjet, electrostatic and all types of impact printers, with advantages over all of the above, says Lester.

Chomerics Offers Lifetime Keyboard Guarantee

Chomerics, Inc. Woburn, MA, a major membrane keyboard manufacturer, recently announced it will offer lifetime guarantees on its Fastype™ line of alphanumeric keyboards. The guarantee covers end-product keyboard use, and is said to be the first available in the A/N keyboard market.

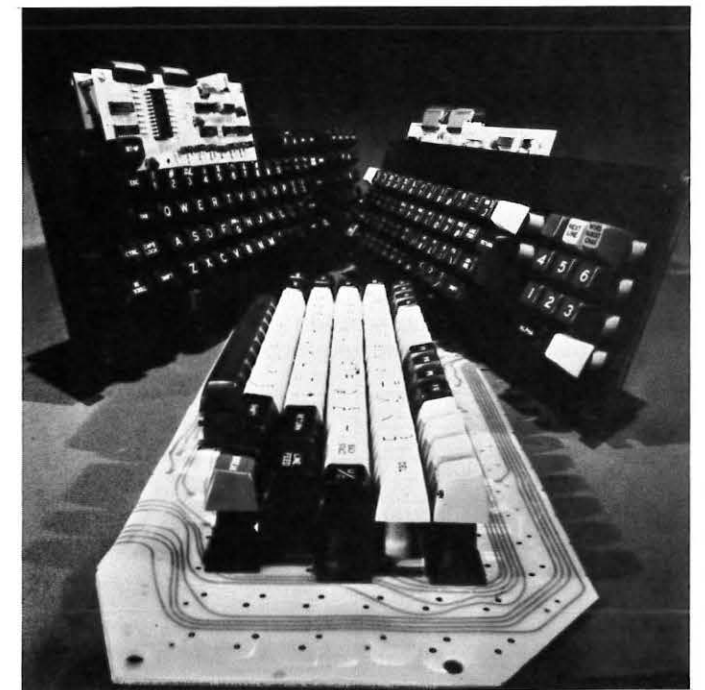
In making the announcement, Len Halio, general manager of Chomerics alphanumeric products said: "Issuance of a lifetime guarantee reflects the quality and reliability of our Fastype keyboards. Since we have complete control over the manufacturing process—from conductive ink formulation to keytop production—it is only natural that we stand behind our products.

"Furthermore, Chomerics is in the unique position of being the world leader in membrane switch technology. The company invented this technology in the late '60s and holds more than 100 patents covering the spectrum of material and component developments critical to its reliability and economy," said Halio.

In outlining the guarantee program, Chomerics stated that it will unconditionally replace any keyboard that becomes defective in the course of normal operation in end-use applications. Halio said, "This does not cover damage resulting from abuse. It is effective with shipments on or after January 1, 1981."

Chomerics, with nearly half of the membrane keyboard market, introduced a complete line of high-end, alphanumeric membrane keyboards last year. Membrane switches are said to provide a cost-effective alternative to both conventional electromechanical and solid state switch-based keyboard designs.

Halio points out that Chomerics has delivered more than 15 million membrane keyboards for over 1,000 applications since 1970. Its keyboards are currently integrated into products such as a computerized PABX system, an industrial robot, appliances, telephones, electronic toys, instruments, and terminals.



Lifetime guarantee now offered on Fastype™ line of alphanumeric membrane keyboards from Chomerics Inc.

HIGHLIGHTS OF THE SID '81 INTERNATIONAL SEMINAR AND SYMPOSIUM

Symposium Topics Covered in 16 Daytime Sessions:

Electroluminescent Displays
Hard Copy
Human Factors
Non-Impact Printing and Recording
Passive Displays
Color CRTs
CRTs
Panel and Large Screen Displays
Graphics and Image Processing
Plasma Displays
Display Systems

Seminar Topics Covered in Two Day Sessions (April 27 and May 1)

CRTs for Information Display
Passive Displays
AC Plasma Display Panel Fabrication Technology and Intrinsic Panel Addressing Techniques
Electroluminescent Displays
Printer Technology and Applications
Display Interface Requirements
Architecture for Display Terminals
Human Factors and Display Quality
Display Technology Forecasting

Keynote Address:

Videotext: Information Display for the Mass Market, by Richard Clark, Joan de Smith (Systems) Ltd., London, England.
Progress report on display standards, stytem designs, prospects for the future.

Invited Papers:

Telconferencing for Business Meetings
Space Industrialization and the Role of Information Display
Hardcopy Technology in Japan
Trends in AC Plasma Displays in Japan

Luncheon Address:

Sports telecast programming by the NBC sports director. His talk will cover setup procedures and a wide assortment of display equipment required, illustrated by video tapes.

Evening Panel Topics:

Displays and Health Hazards
IC Approaches to Addressing Problems
Engineering/Scientific Office of the Future.

Number of Authors/Coauthors:

More than 175 from U.S., England, Finland, France, Japan, Switzerland, Taiwan, and West Germany.

Award Ceremonies:

1980 Symposium Best Papers
Sid Honors and Awards

Exhibition:

International show featuring latest developments in equipment, accessories, components, and measuring devices.

Symposium Registration Fees:

Advance . . . \$50.00 (Member) . . . \$65.00 (Nonmember)
Symposium . . . \$60.00 (Member) . . . \$75.00 (Nonmember)

Seminar Registration Fees:

One Day (Monday or Friday) . . . \$80.00
Two Days (Monday and Friday) . . . \$125.00

DIGESTs (Additional Copies):

\$30.00 (Member) . . . \$40.00 (Nonmember)

Symposium/Seminar/Exhibit Dates:

Symposium and Exhibition . . . Tuesday to Thursday, April 28-30
Seminars: Monday, April. 27 and Friday, May 1

Symposium/Seminar/Exhibit Information:

Lewis Winner, 301 Almeria/Box 343788, Coral Gables, FL 33134. 305-446-8193/4(1:00-5:00 P.M.)

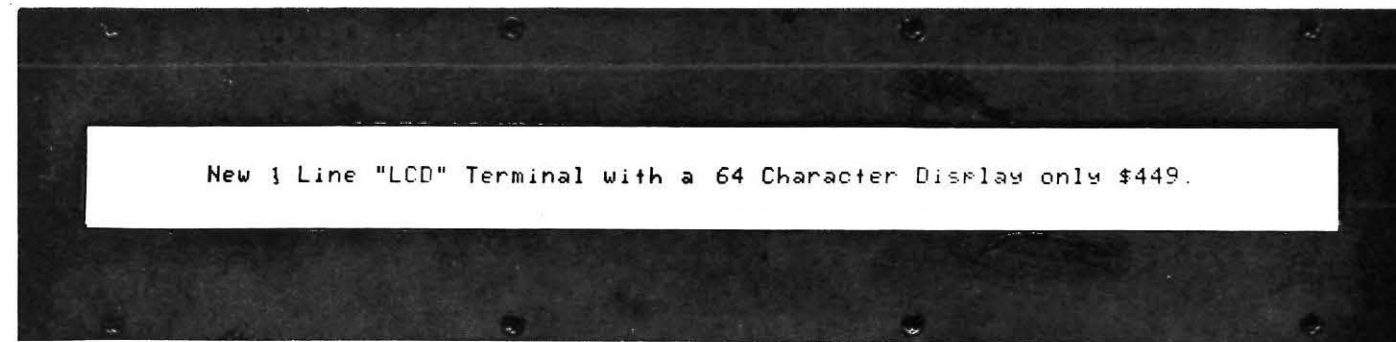
SID '81 AT THE GRAND HYATT HOTEL NEW YORK CITY

	Timetable	Empire State Ballroom Foyer	Empire State Ballrooms					CARNEGIE-BWAY-JULLIARD
			A	B	C	D	E	
Sunday April 26	4:00 P.M. 9:00 P.M.	SID 81 Registration	-----	-----	-----	-----	-----	-----
	Monday April 27	8:00 A.M. 8:30 A.M.	Seminar Registration	-----	-----	-----	-----	-----
8:30 A.M. 5:15 P.M.		-----	-----	-----	-----	-----	SEMINAR I-IV	
Tuesday, April 28	5:00 P.M. 9:00 P.M.	SID 81 Registration	-----	-----	-----	-----	-----	-----
	8:00 A.M. 4:00 P.M.	SID 81 Registration	-----	-----	-----	-----	-----	-----
	10:00 A.M. 5:30 P.M.	-----	Exhibits		-----	-----	-----	-----
	9:00 A.M. 9:30 A.M.	-----	-----	-----	SESSION I SID BUSINESS MEETING		-----	-----
	9:30 A.M. 10:15 A.M.	-----	-----	-----	SESSION II FORMAL OPENING		-----	-----
	10:15 A.M. 11:00 A.M.	-----	-----	-----	SESSION III KEYNOTE ADDRESS		-----	-----
	11:00 A.M. 12:00 Noon	-----	-----	-----	SESSION IV INVITED ADDRESSES		-----	-----
	12:05 P.M. 1:40 P.M. [Lunch]	-----	-----	-----	-----	-----	-----	-----
	2:00 P.M. 5:00 P.M.	-----	-----	-----	SESSION V Electroluminescent Displays	SESSION VI Hard Copy	SESSION VII Human Factors	-----
	5:15 P.M. 6:15 P.M.	-----	-----	-----	-----	AUTHOR INTERVIEWS		-----
	6:00 P.M. 7:30 P.M.	-----	Social Hour			-----	-----	-----
	8:00 P.M.	-----	-----	-----	INFORMAL DISCUSSIONS E-1 Health Hazards and Displays E-2 IC Approaches to Addressing Problems		-----	-----
Wednesday, April 29	8:00 A.M. 4:00 P.M.	SID 81 Registration	-----	-----	-----	-----	-----	-----
	9:00 A.M. 5:00 P.M.	-----	Exhibits		-----	-----	-----	-----
	9:00 A.M. 11:45 A.M.	-----	-----	-----	SESSION VIII Non-Impact Printing and Recording	SESSION IX Passive Displays I	SESSION X Color CRTs	-----
	12:00 Noon 1:50 P.M. [Lunch]	-----	-----	-----	Lunch - Invited Talk	-----	-----	-----
	2:15 P.M. 5:00 P.M.	-----	-----	-----	-----	SESSION XI Passive Displays II	SESSION XII CRTs	-----
	5:15 P.M. 6:15 P.M.	-----	-----	-----	-----	AUTHOR INTERVIEWS		-----
Thursday, April 30	8:00 P.M.	-----	-----	-----	INFORMAL DISCUSSIONS E-3 Engineering-Scientific Office of the Future		-----	-----
	8:00 A.M. 11:00 A.M.	SID 81 Registration	-----	-----	-----	-----	-----	-----
	9:00 A.M. 12:00 Noon	-----	-----	-----	SESSION XIII Panel Displays	SESSION XIV Image Processing Graphics	-----	-----
	9:00 A.M. 12:00 Noon	-----	Exhibits		-----	-----	-----	-----
	12:00 Noon 1:00 P.M.	-----	-----	-----	-----	-----	AUTHOR INTERVIEWS	
	12:00 Noon 1:40 P.M. [Lunch]	-----	-----	-----	-----	-----	-----	-----
Friday, May 1	2:00 P.M. 5:00 P.M.	-----	-----	-----	SESSION XV Plasma Displays	SESSION XVI Display Systems	-----	-----
	8:00 A.M. 8:30 A.M. 5:15 P.M.	Seminar Registration	-----	-----	-----	-----	-----	SEMINAR V-VIII

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As the operator types, a full 64 character 5x10 dot matrix line appears on keyboard display. The terminal stores several pages of memory with text editing and scrolling. The print button transfers text to LCD imager units memory and synchronizes the display to copier scan rate with a strobe light. A low cost alternative to IBM, Wang, and other non-impact printers. Options: Multiple terminals and full page CRT's are available.

Graphic quality LCD imaging will be available in the near future allowing any style font. Full page LCD high speed imagers using thin film transistors directly driven will culminate this technology. LCD imager unit is manufactured under license by Minolta Corporation exclusively for Static Systems. Copier is standard. System as shown under \$6,000. Delivery this year. Write for technical information. Patents worldwide.

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TRW-Fujitsu Introduces New POS Terminal

The TRW-Fujitsu Company (TFC), Los Angeles, recently announced its first product since the joint venture began—a retail POS terminal that offers retailers a high degree of flexibility in tailoring terminal operation to specific point-of-sale transaction needs.

The terminal, designated the TFC 7880, makes available a choice of display types, keyboard types, cash drawers and memory configurations including up to one megabyte of internal storage using bubble memory technology. The manufacturer states that this flexibility, combined with proven transaction software, gives the user the ability to configure each terminal with only those features necessary to match his operating style.

"TRW-Fujitsu is offering retailers two highly sophisticated 'a la carte' menus of features and transaction software," says William Carr, vice president of retail systems for TFC.

The TFC 7880 offers the user one of three display types, ranging from a numeric version providing basic operator prompting to one that's highly interactive. A 40 character alphanumeric display type provides additional prompting flexibility. Also available is a full function 320 character version utilizing plasma display technology.

"With three choices, you select and pay for the level of operator prompting required to perform transactions best at each particular point of sale," Carr explained. "For checkout lanes where operators perform routine transactions, a numeric display may be all that's needed."

The plasma display offers the highest level of operator prompting and is appropriate where transactions are more complex, such as at customer service desks to handle layaways and returns. An optional customer display is also available.

The system's transaction software works with each of the displays, so operations continuity can be maintained when different display types are used in the same store.

"The powerful microprocessor-based terminal can function as a dedicated unit in a variety of different retail functions such as checkout, layaway, stockroom, or customer service, depending on the customer's selection of hardware options and software options," Carr noted.

Internal program memory is available with capacities from 32 K to 128 K bytes of RAM.

Data storage capabilities can be directly integrated into the terminal with the addition of a non-volatile bubble memory. The bubble memory capacity ranges from 32 K to one million bytes of data storage. The high-speed characteristics of the bubble memory enable users to generate promotional item price lookup or local layaway files quickly.

The 7880 is said to be the first POS terminal to offer as an option a magnetic stripe credit card reader that is directly integrated into the terminal. The card reader located just above the keyboard.

The TFC 7880 terminal also offers a choice of two programmable keyboards for sales recording and data entry. Key functions are coordinated with prompting instructions on each of the three displays to speed and simplify transaction processing. To further improve the speed and accuracy of sales and merchandise information entry, automatic reading capabilities such as OCR-A wand readers can be easily added, TFC states.

In terms of communications, the terminal has been designed to meet both on-line and switched network requirements within the retail industry. It can interface with a variety of processors, controllers, and peripherals, and can be intermixed in a common network to satisfy the exact needs of the retailer.

The new POS terminal will be supported by the TRW Customer Service Division, a nationwide service organization. "While the TFC 7880 POS Terminal is brand new, it is far from an unknown quantity," Carr said. "Fujitsu products are known worldwide for their quality and reliability."



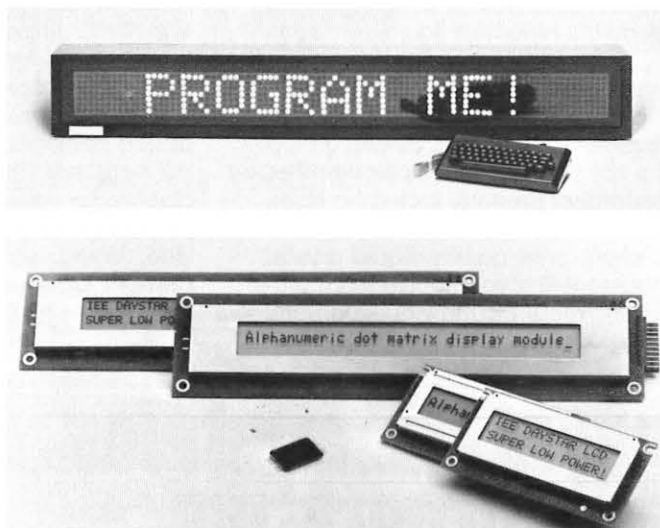
The TRW-Fujitsu Company's 7880 POS System is said to be the first on the market to offer as options such state-of-the-art technology as bubble memory, plasma display, and an integrated magnetic stripe card reader.

Programmable Electronic Message System

The Z-PEMS (Programmable Electronic Message System) 8001 manufactured by One-Up, Inc., Santa Ana, CA., was chosen for special recognition in the Advertising and Promotion Showcase at the 1981 International Winter Consumer Electronics Show in Las Vegas.

The Z-PEMS 8001 is a new addition to One-Up's product line of LED computerized message systems. This new system features a high intensity display with four-inch characters. Features include: traveling message presentation; scrolling message; flashes and winks; spells on; wipes on; definable graphics and animation; variable width letters; and a combination of any of the presentations.

The system consists of only two components: the display sign and the programmer. They may be detached, while the memory remains stored in the programmer.



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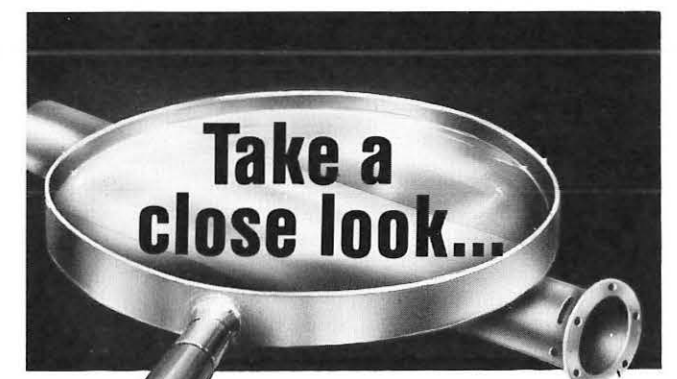
11 East 26th Street, New York, New York 10010 (212) 679-8535

IEE Announces New Family Of Alphanumeric LCDs

The Industrial Products Division of Industrial Electronic Engineers, Inc. (IEE), Van Nuys, CA, has introduced a new line of low-cost alphanumeric liquid crystal display modules and accessories. The company's new DAYSTAR minimum logic products replace earlier, more expensive devices. The electrical interface, mounting and cutout dimensions are identical on corresponding new and old models. Principal changes include a low-profile package design and modified environmental specifications. Resulting mass production techniques allow price reductions of up to \$180.00 per unit depending on model and quantity purchased, according to Carl Doria, national sales manager, IEE.

The new DAYSTAR minimum logic family includes four displays, an optional ASCII controller IC, and cables. There are 1x16, 2x16, 1x40 and 2x40 models. All displays are 5x7 + cursor dot matrix devices. Each requires +5VDC at less than 1mA. The optional CMOS controller IC is said to reduce system development time by providing an ASCII interface, cursor control, character generation, timing and refresh functions.

Demands on the host system are minimized as well. This IC supports the current 5x7 + cursor DAYSTAR displays and upcoming 5x11 + cursor dot matrix models. All items are available immediately. DAYSTAR evaluation kits, consisting of a display, cable and the controller IC mounted on an evaluation board, are being offered for a limited time. The pre-assembled evaluation PC board contains all components and controls required to demonstrate each DAYSTAR feature.



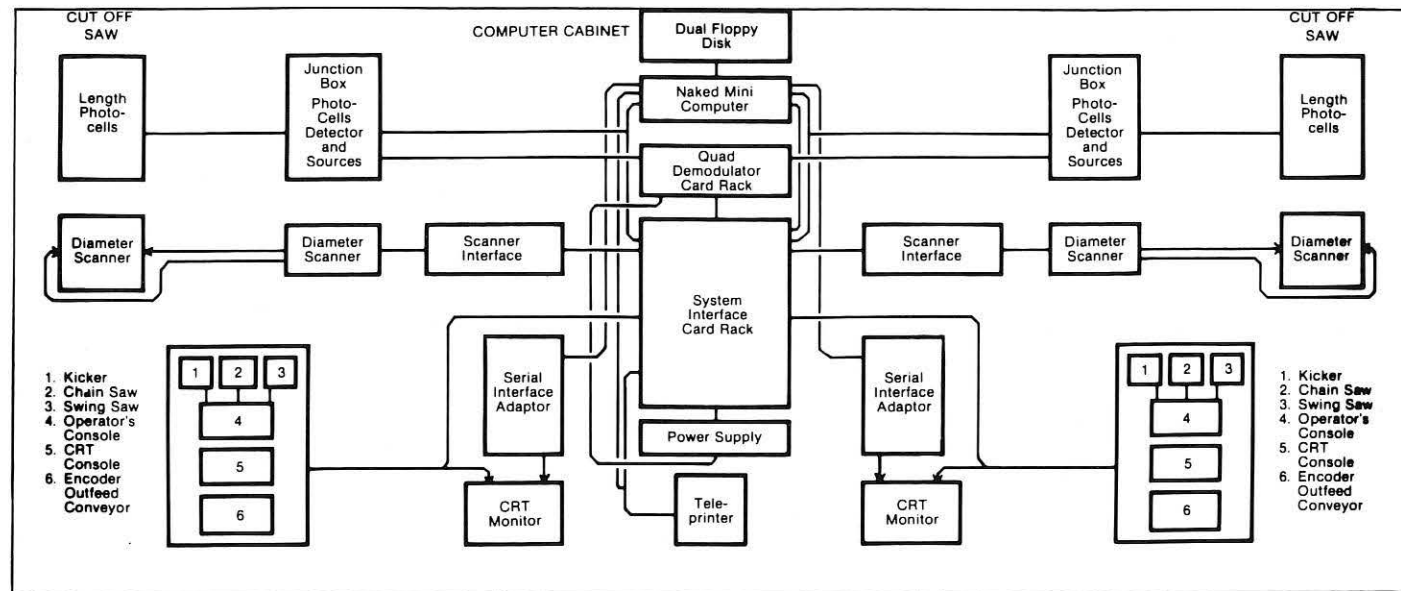
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Automated Lumber Flowchart—Schematic representation of automated cut off saws at the Port Alberni Sawmill in British Columbia. Diagram shows the electrical cabling for system developed by Lloyd Controls, Ltd., also of Vancouver. System is controlled by a NAKED MINI computer from Computer Automation, Irvine, CA.

\$54 Million Port Alberni Conversion Streamlines Lumbermill Operations

MacMillan-Bloedel, a leading Canadian forests product company, has converted its turn-of-the-century Port Alberni sawmill in British Columbia into what is said to be Canada's most advanced, automated lumber production facility by installing automated equipment and controls developed by Canadian-based Lloyds Controls Ltd. The computerized equipment installed by Lloyd Controls includes NAKED MINI® computers from Computer Automation, Inc., Irvine, CA.

More wood per tree, less waste per board, faster production, more overall efficiency per daily operations—those are a few of the hard fact benefits that are derived from Port Alberni's automated sawmill.

"The Port Alberni mill conversion represents an historical shift in the entire nature of sawmilling operations in Canada," reported Dale Tuckey, systems manager for MacMillan Bloedel in Port Alberni. "For many years the industry has employed and relied upon automated equipment and the computer in its pulp and paper mills; but a prevailing attitude among sawmillers was that every log was different and wouldn't accept automation in the same way that chemicals, sawdust, and standard processes would. The job of a lumber sawmill is to slice logs into usable lumber, not turn pulp into cardboard boxes and stationery—and for a very long time lumbermen felt the computer couldn't help produce 2x4's and ceiling rafters." Technology has come a long way in the last few years. Finally, computers and electronic equipment are durable and reliable enough to withstand the harsh environment of the sawmill. And lumbermen are becoming convinced that computers can perform at more optimum levels of productivity than even the most jaundiced-eyed log-assessor.

Warren Thomlinson, president at Lloyd Controls, explained just what his company does: "We develop customized systems for sawmills. Our systems can actually analyze every log and determine the best way to cut the log for maximum product yield and minimum waste. We also provide systems that sort finished lumber product and provide management reports, enabling the sawmill's

management to analyze the entire milling operation and productivity on a day-to-day, shift-by-shift basis."

The Port Alberni sawmill has a total of five different computer-controlled automated systems that streamline the entire process of producing lumber. Four of those systems were developed by Lloyd Controls Ltd. and rely on NAKED MINI computers from Computer Automation, Inc. The fifth system was supplied by Applied Theory Associates and is controlled by a Hewlett Packard computer.

After a tree has been chopped down and transported to the mill with hundreds of other trees just like it, then the bark is stripped from each log. Debarked trees are ready to move through the mill on a system of conveyors.

Computers throughout the mill have been programmed and contain all the vital information about the logs—species, marketing requirements, etc. In addition, the computers contain all the programming required to control equipment throughout the mill—saws, conveyors, photo-optic cells, etc.

Information such as the dollar value of different cuts and sizes of lumber, demand for each kind of board, and the overall profitability obtainable from the lumber is stored inside the computers. The computers are prepared to tell mill operators whether 2x4's, 2x6's, joists, rafters, or other cuts of lumber are preferable. In some instances the computer automatically relays that information to automatic saws that can slice logs without an operator.

Logs move into the mill on conveyors. Each log is scanned by photo-optic cells which measure the log for diameter and length. This information is immediately fed to the computer automatically. The computer determines the best way to "buck" the log for optimum yield. (Bucking is the process of cutting the long log into a number of shorter logs and was previously done by the bucking saw operator, who could only see the butt end of the log as it approached his sawing station.)

Now, computer-controlled devices determine all the characteristics of the log long before it reaches the bucking saws. Data is flashed onto a CRT screen and a digital display in front of the saw operator. The conveyor moves the log into position, and then the operator activates the saw. The bucking saw operator can override the computer decisions if he sees an obvious problem such as tree damage from a forest fall. However, in most cases, the computer has determined the best way to segment the log so that waste is minimized.

Port Alberni . . . Continued from page 18

Once logs are bucked, they move along to the head rig saws, where they are sliced into rough lumber. Again, an automated system developed by Lloyd Controls controls the log carriage networks that positions the log in front of the sawblades. The Computer Automation NAKED MINI computer also provides the operator with concise data on how to cut the log for optimum yield.

The computer controls the bunks holding the log in place and remembers exactly where the bunks held the log, calculates their present location as well, so the operator simply has to initiate operation instead of worrying about positioning the logs for optimum cuts. After the logs have been broken down by the head rig, they move down the line to the Cant Quad area, where four bandsaws will saw the cuts into the desired widths and thicknesses.

A NAKED MINI computer sends information about the lumber to the bandsaw operator and controls the networks of the log carriage. The computer is programmed to allow for the "kerf" (the space created by the saw passing through the wood), so calculations as to maximum yield are very exact.

A totally automated sawing station, The Log Quad, is also employed at the Port Alberni mill. The Log Quad station accepts smaller diameter logs (13" to 23") and is controlled by the Hewlett Packaged computer. The computer receives a plan view of the log from photo-optic scanning cells and the grabber that positions the log in front of the four bandsaw blades. It also determines how much lumber the chipper heads will cut from the log. This station is the first fully-automatic sawing area in a Canadian sawmill, according to Dale Tuckey of the forest products producer.

These automated sawing procedures enable up to 12 pieces of lumber to be produced each minute. In pre-automated sawmilling days, says Thomlinson of Lloyd Controls, a man could have been about 10 to 20 as percent efficient at equivalent high production rates. And the automation doesn't stop at the saws.

Very important to the overall efficiency and productivity of the Port Alberni mill are the two automated lumber sorting systems provided by Lloyds Controls. Controlled by NAKED MINI computers, these sorting systems move the produced lumber to appropriate storage bins. Cut lumber moves along the sorting conveyors at rates up to 90 pieces per minute toward from 24 to up to 80 different bins. A great many manhours of tedious work are eliminated by this automated sorting method.

We are very excited about the Port Alberni Sawmill conversion," reported Tuckey. "The mill introduces a new era of Canadian lumber milling—an era that was a long time in coming, but that now has arrived."

MacMillan Bloedel is already planning more conversions of other mills, convinced that the \$54 million investment at Port Alberni will return itself many times over in more efficient operations and increased mill productivity.

The paybacks are increased mill productivity, more lumber from each log, and the ability to cut every log into the most valuable product demanded by the marketplace at the time the log is moving through the mill, Tuckey explains. He added that there are many additional benefits that will help make the mill even more productive.

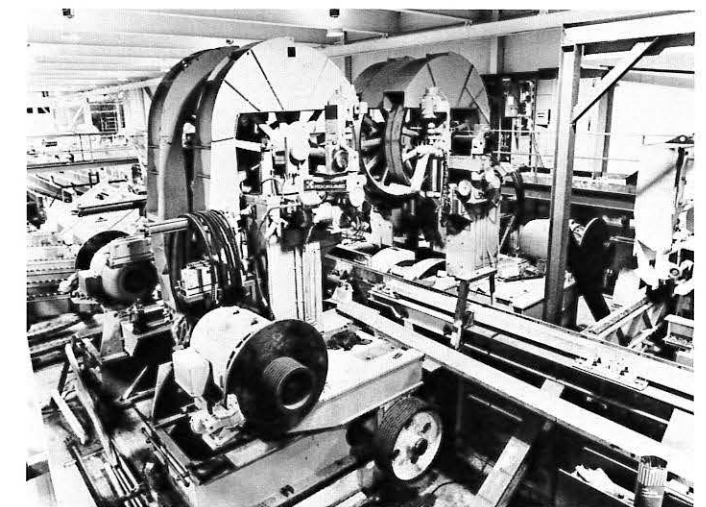
"While we can't really measure the added benefits of computer-assisted management decisions at this time, we foresee significant value in the improved management information the computers will make possible," Tuckey says.

"Since the computers are monitoring all activity in the mill, we can use them to generate reports on production per shift, production by item, as well as other information

such as quality control data. We'll know almost immediately how well quality-control is achieved throughout the mill," Tuckey adds.

Thomlinson of Lloyds Controls is very optimistic about the many opportunities computerization is providing the sawmilling industry. He says that the hard dollar savings produced by automated systems are far from the overall marketing benefits that can be derived from the computers, once they are installed.

"For the first time, sawmill management will have accurate, immediately available data on inventory status, marketing trends, sales histories and the ability to project future trends—all from reports generated from the computer," Thomlinson noted.



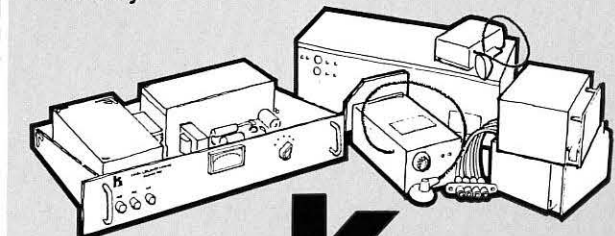
The Log Quad by Kockums represents an almost entirely automated station handling logs between 33 and 58 cm diameter.

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Thinking about Color for Avionics Displays? Think Syntronic Deflection Yokes

Cockpit displays in color are the hottest thing in avionics. Why? Because color increases the amount of information a pilot can absorb in a finite time frame. Think of the myriad uses of color. Emergencies or targets highlighted by red. Normal status is white or green. Sky shown in blue with the ground in brown tones. Almost anything displayed mechanically now can be displayed on a color CRT, with no parallax, a condensed format and less clutter on the instrument panel.

But color displays are many times more complex than monochromatic displays because of the critical interface between CRT, yoke and circuitry. And avionic quality displays are too demanding for conventional color TV type yokes.

That's where Syntronic helps the display engineer. For several years, Syntronic Instruments, Inc., the leader in precision yokes for military and industrial displays has been working with major international manufacturers of full-color shadow mask tubes to develop high performance color yokes. High resolution, color purity and convergence, along with faster speed for more display information, all combine to make

deflection yoke design a truly challenging task. Syntronic now offers the yoke design capability and the technical assistance needed for today's and tomorrow's top quality color avionics displays.

If you're thinking *color*, think Syntronic Instruments. Call Dave Brown at 312-543-6444 for more information.



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Systeme Introduces Computer System To Automate Operations and Marketing of Financial Institutions

Systeme Corporation, Winter Park, FL., recently announced what is described as the first computer system to integrate the back office operations, planning, and marketing services of financial institutions.

Its new financial information and control system (FICS) has been specifically designed by Systeme to increase productivity in thrift institutions and commercial banks through a broad range of computer and word processing applications. These include financial planning and modeling, general ledger, mortgage loan tracking, closing and document preparation, new account processing, and electronic mail.

Thomas H. Everhart, Systeme's board chairman, says: "Computer and word processing applications in financial institutions traditionally have been separate islands to themselves. It is common to have one system for mortgage loans, another for financial planning, and still another for inter-branch communications. This 'melting pot' approach means different vendors, hardware, and procedures throughout an institution.

"Our new system integrates all these functions into a single system that's aimed at one direction—increasing productivity and, thus, maintaining profitability in light of challenges unparalleled in U.S. banking history."

Today, savings and loan associations, mutual savings banks, and commercial banks are facing increased competition among themselves and companies such as Sears Roebuck, Merrill Lynch, and American Express, pending legislation and increased paperwork, volatile interest rates, continued inflation, interest bearing checking (NOW) accounts and rising operating costs. Under the Depository Institutions Deregulation and Monetary Control Act of 1980, many of the traditional and legal distinctions previously inherent between thrift institutions and commercial banks are becoming blurred, if not totally phased out.

The New System

At the heart of Systeme's new FICS are six subsystems:

- Financial Planning and Modelling—featuring a summary level of "what if" alternatives for senior executives and a more detailed level for middle management. A separate module of this subsystem allows institutions to comply with pending legislation to the net worth reporting regulations for insured institutions.
- Total Loans in Process—including mortgage loan tracking, closing and document preparation, and reporting the exact status of loans in the pipeline.
- New Account Processing—condenses the entry procedures of new account opening information from what normally has been three of four steps with manual procedures after each into one step. In addition, the customer verifies the accuracy of the entered information on a video display at the time the account is opened. This subsystem also is designed to relieve the increase of teller window traffic due to the start of NOW accounts.
- WORDplus—a word processing system that provides the ability to personalize repetitive documents and quickly turn blocks of standard information into marketing tools. The list of applications includes personalized direct mail letters to customers who have paid off loans, new accounts,



Today in many institutions, a new account results in a typed document; then a CRT entry for the central information file; then a letter from a word processor. With Systeme's FICS, the maker claims one-time entry of new account information, which is then made available throughout the other FICS subsystems. The new account processing subsystem is designed to relieve the increase of teller window traffic due to the start of NOW accounts. In addition, the customer verifies the accuracy of the entered information on a video display at the time the account is opened.

customers with large accounts, newlyweds, anniversaries, and birthdays.

- Electronic Mailbox—speeds communications between a main office and branches. Applications include management announcements, the latest money market information, and consistent savings counseling tips. Wherever a video workstation is installed, the display can also be used as a mailbox.
- General Accounting—places financial information, including general ledger, payroll/personnel, accounts payable, cost accounting, investment portfolio, and income and expense reports within easy access.

FICS users have the option of incorporating all or some of the subsystems with the knowledge they can expand or modify the system at any time. The FICS features an integrated information base that is shared among all subsystems. Once data is entered in one subsystem, it is available throughout. In addition, the same video workstation is used for all FICS applications.

The system has been designed so revisions can be made within the institution without having to call in programmers or other technical data processing personnel.

According to Systeme, FICS is tailored to each institution's operations requirements with the total system, hardware and software, guaranteed.

FICS can interface with all central computer systems currently used by financial institutions. This gives the institution or service bureau the ability to change central computers at any time, while maintaining operational continuity, according to Everhart of Systeme.

The new system has been installed at First Federal Savings and Loan of Charlotte County in Punta Gorda, FL., for mortgage loan tracking, closing, document preparation and customer inquiries, on-line communications to IBM and Burroughs central computers, and word processing. Fidelity Federal Savings and Loan of West Palm Beach, FL., is using the system for payroll, construction job costing, general ledger, accounts payable, and new account processing. Florida National Bank in Orlando, FL., is using the system for word processing. Indian River Federal Savings and Loan of Vero Beach, FL., has installed the system for new account processing, payroll, word processing, and total loans in process.

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- Magnetic Shield/Dust Cover For Small Aircraft Radar Tube
- Specialized CRT Shield
- Hydroformed CRT Shield
- Magnetic Isolation Chamber
- Foil Motor Shields
- Geo-Magnetic Investigation Chamber
- Hydroformed Storage Tube Shield
- Storage Tube Shield
- Movable Multi-Layer Controlled Magnetic Environment Chamber
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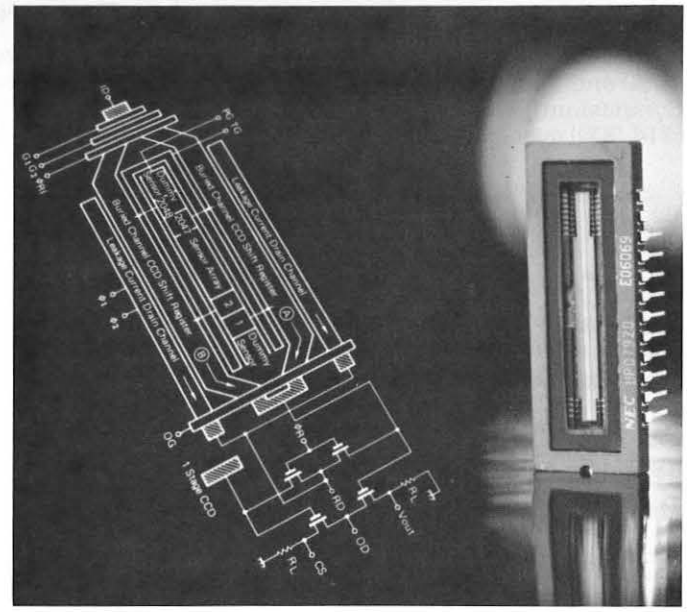
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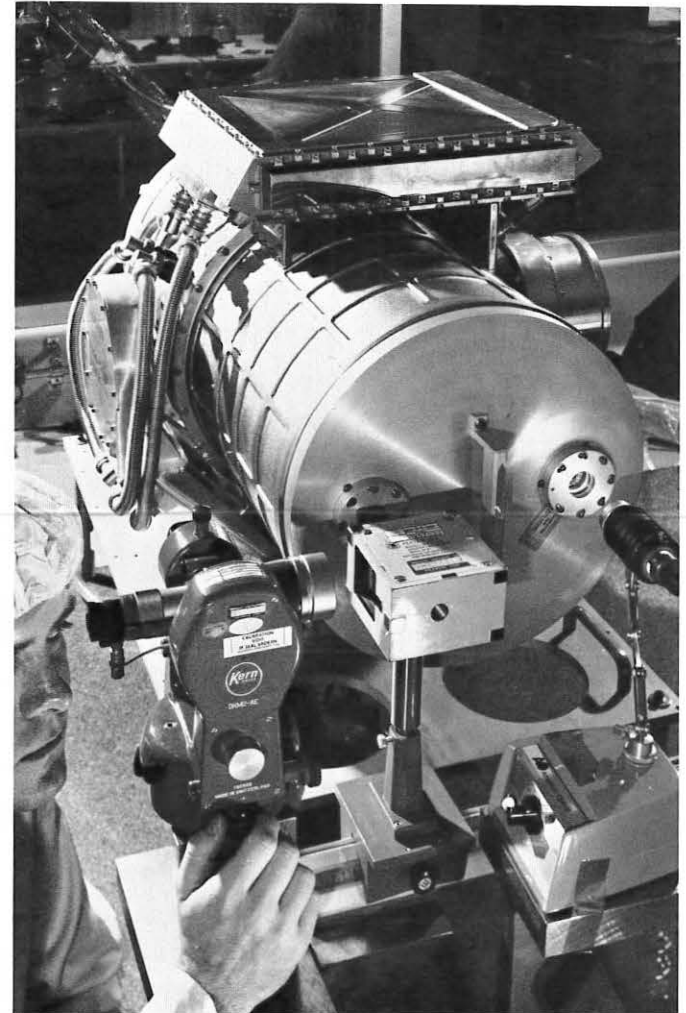
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Major Advance in High Speed Signal Acquisition

National Bureau of Standards scientists have recently built and tested what is claimed to be the fastest known real-time analog-to-digital converter. The NBS superconducting device uses Josephson junctions as its active elements, has six-bit resolution, and in tests has performed two billion A/D conversions per second. It should ultimately be useful for a variety of civilian and military applications involving high-speed measurements and signal processing. One use might be to measure the shape of fast transient phenomena encountered in different types of fusion experiments. Such events last only several billionths of a second, and improved time resolution could yield valuable information. Laser chemistry, radar, communications, and weapons testing are other areas where such high-speed measurements are essential.



New charge coupled, 2048-bit high resolution linear image sensor from NEC electron in 24-pin dip package.



Retrievable Space Sensor—Optical alignment is verified on an infrared sensor that will be rocketed to the edge of space to detect and track ballistic missiles. Optical engineer William Davis conducts the tests at Hughes Aircraft Company's Electro-Optical and Data Systems Group, Culver City, Calif. The sensor, a part of the U.S. Army's Designating Optical Tracker (DOT) Program, is designed to be carried by a missile to an altitude of 100 nautical miles, where it scans a wide area of space and relays what it "sees" to the ground. At mission end, the sensor is parachuted into the ocean, where it is located and then recovered for refurbishment and reuse. Two DOT sensors, launched from Kwajalein Missile Range, have successfully demonstrated long-range infrared detection capability during three missions. One sensor was retrieved after its first launch and performed a second mission. The other sensor also was retrieved. Hughes developed the sensors under contract to Boeing Aerospace Company, prime contractor for the DOT program.

NEC Electron Unveils 2048-BIT, High Resolution Image Sensor Charge Coupled Device

A new charge coupled linear image sensor with 2048 picture elements having applications for optical character readers, facsimile machines, and for making electronic measurements, is now available from NEC Electron, Inc., Sunnyvale, CA.

The new device is the μ PD792D. "It has a sensor array of 2048 MOS capacitors, enough to resolve patterns at a rate of 8 lines/mm over paper 25.6 cm wide," says Takashi Takagaki, NEC Electron product marketing manager for industrial integrated circuits.

The CCD array is a surface type and stores photoelectrons produced by incident light. The μ PD792D's sensor array is driven by a single photogate. Takagaki says it can maintain a larger amount of charge and produce lower dark-current than a buried layer type sensor array. Each sensor area is 9 μ m by 14 μ m.

In addition to the 2048-bit sensor array, each high resolution device has a charge input, one charge coupled device shift register located on either side of the array, a transfer gate, and a charge detector with a noise compensation circuit.

The device, for which NEC Electron is the original source, features a wide dynamic range of 500 KHz (typical); a transfer efficiency of more than 99.996%; operating voltages under 15 V; on-chip preamplifier and compensation amplifier.

Major electrical characteristics of the UPD792D are: typical saturation output of 400 mV; typical photoresponse non-uniformity of plus-minus 5% of V_{out} ; average dark signal of 20 mV (maximum); and typical power dissipation of 200 mW. The 24-pin DIP package is 43 mm by 15 mm.

Treasurer's Report

The following table summarizes our Society's financial status as of December 31, 1980. Included for comparison are our 1980 and 1981 budget. In 1980, we have accumulated a surplus of \$25,640 due to the exceptional surplus from 1980 Symposium (\$27,000) and extra sales of past publications (\$10,000) which were offset by mounting cost of publications (\$14,000) over 1980 budget for Journal, Proceedings, and Directory). The 1981 budget has been approved by the board.

Respectfully yours,
Ifay F. Chang, Treasurer

SID Financial Report

Total Assets	76,538
Total Liabilities	586
Fund Balance	75,753

Operations Fund Statement

Beginning Fund Balance 50,113 Jan. 1, 1980

	as of 12/31/80	1980 Budget	1981 Budget	
INCOME				
1Membership Dues	52,284	43,362	46,892	
Publications	57,602	47,500	57,450	
Operations	32,319	13,500	24,125	
EXPENSES				
National Office	33,545	34,700	39,530	
2Publications	68,201	54,700	61,250	
Operations	14,839	12,800	21,000	
INCOME-EXPENSES	25,640	2,162	6,687	(Surplus from Symposium 1980 = 27,110)

1. Membership increase 233 compared to December 31, 1979
2. \$14,000 over budget

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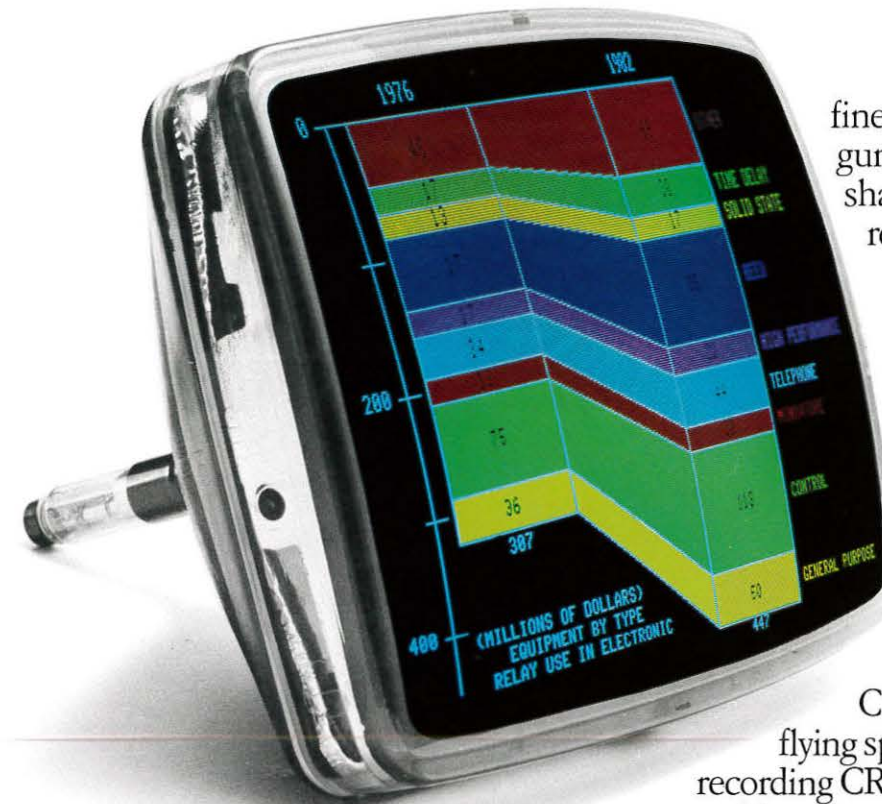
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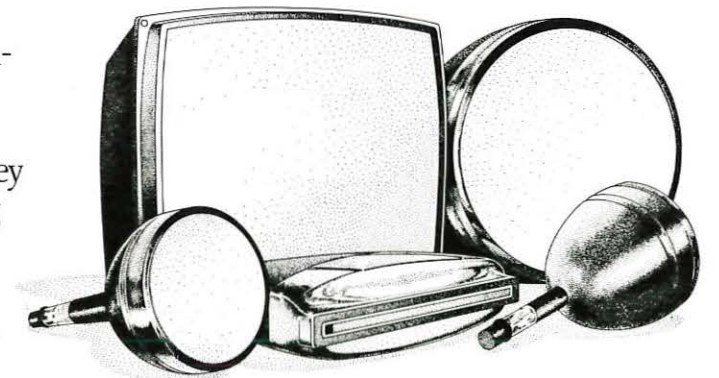
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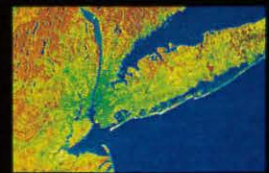
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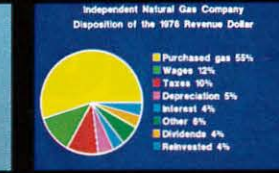
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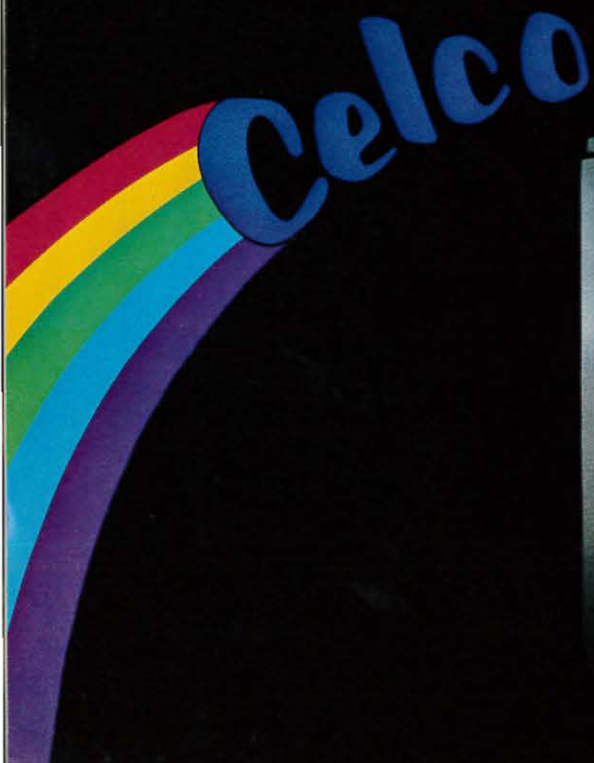
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