

Chapter News

MIDWEST CHAPTER on December 8 enjoyed a talk by Joseph Novak, Novacolor, Inc., featuring the basic technology, processes, and equipment used in electronic digital image processing. Methods were described for contrast modification, color correction, retouching, sharpening blurred pictures, pseudocolor, photocomposition, and minimizing film grain. This was a joint meeting with SPSE.

NEW ENGLAND CHAPTER on December 11 heard an interesting paper by David Luther, product marketing manager, Computer Graphics Group, Inlac Corporation. Title of the paper was "Interactive Graphics Applications."

In his talk, Luther pointed out that computer display terminals have been available for nearly fifteen years. For a long time they appeared to be a solution in search of a problem. As computers became faster, sophisticated software was written and terminals became cheaper, interactive graphics moved from being experimental to being an everyday work tool. New computer terminals have come of age. Luther discussed how the terminals have been used, what advancements have been made in design, and whether raster or stroke graphics will dominate.

A number of specific application areas that draw upon the most effective man-machine interface techniques were also covered.

MINNEAPOLIS/ST. PAUL CHAPTER on November 21 had as a featured speaker Glenn H. Keitel, technical director, CPT Corporation. He provided a lecture and demonstration on the Models 6000 and 8000 word processors. According to Allen Taylor: "We had our ladies with us (most of them are secretaries). They enjoyed the new word processors."

LOS ANGELES CHAPTER on October 29 went to Little Joe's Restaurant and then to Dodger Stadium for a talk by Makie Matsuboyashi of AMPAC American Pacific Consultants groups. The subject was the large flat-panel "Diamond Vision" screen, the world's largest color video screen with a 16 ft. x 20 ft. display consisting of about 25,000 light tubes, made by Mitsubishi.

INFORMATION DISPLAY

JANUARY 1981

SOCIETY FOR INFORMATION DISPLAY
654 NORTH SEPULVEDA BOULEVARD
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JAPAN CHAPTER

The technical SID meeting on November 20, 1980 was sponsored by the Institute of Television Engineers of Japan. Members devoted most of their discussions to the problems of having an international information display conference in Japan in around 1983.



(l to r) Mikeo Ashikawa, SID Director, Hitachi Ltd.; Dr. Kol-ichi Miyaji, Chapter Committee Member, Shibaura Institute of Technology; Dr. Shunsuke Kobayashi, Chapter Committee Member, Tokyo University of Agriculture and Technology; Dr. Iwao Ohishi, Chairman, NHK Technical Research Laboratories. The occasion of this picture was the second Japan Chapter Committee meeting of FY1980, held at Saga University on November 20.

On December 3, the program committee of the Los Angeles Chapter planned a discussion and demonstration of two types of dot matrix subsystems: plasma gas discharge and liquid crystal displays. Dr. Chan S. Oh, Senior Scientist of the Display Systems Division of Beckman Instruments, was the main speaker. He compared active and passive display systems, their operating characteristics, multiplexing techniques, and their respective advantages and disadvantages. A demonstration of the operation of each type of display was available for observation by SID members.

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M-33

Information Display

The Official Journal of the Society For Information Display

JANUARY 1981



The French have something big going in telecommunications. Beginning in 1982, the French Telecommunication Authority (Direction Generale Telecommunication) will issue free to its telephone customers a simple keyboard terminal linked to a computer that will enable them to obtain directory information without operator assistance. Initially 250,000 customers in the Brittany region of France will receive the unit. Matra estimates that three million units will be installed in each of the following 10 years. To meet this demand, Matra has developed this prototype Videotext Electronic Directory under contract to the D.G.T., which encompasses the French telephone system. Matra and other French partners are developing software for the computer assistance directory data base. Matra Group, Versailles, France, and its affiliates are among Europe's fastest growing and diversified high

technology group of companies. It is considered a world challenger. The company is into telecommunications, transportation systems and equipment, space satellites, automobiles, data processing, defense equipment, optics, watch and clock making, electronic components, and media services. Among the major partners of Matra Group in the United States are: TRW, Harris, QWIP, Baker International, Hydrill, Digital Telephone Systems, General Automation, and Datapoint.

On page 3 are additional data and pictures on the Matra story. For travelers from the U.S. who have suffered with inferior telephone service in other countries, it's interesting that the French plans promise to provide that nation with perhaps the world's most sophisticated telephone system within the next five years. This includes telecommunications relaying via satellites.

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 February 10. If you miss that, try for the April issue, NOTE: We also welcome feature articles on interesting projects.

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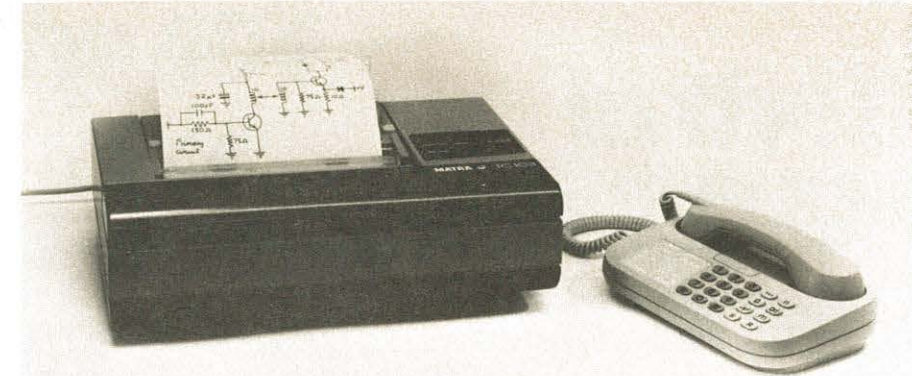
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FAX Telecopier — This is Matra's new Facsimile Telecopier TC 103 that the French company is supplying to the French Telecommunication Authority (D.G.T.) on a preproduction basis. Matra expects the D.G.T., which encompasses the French telephone system, to make a decision soon that will allow full production of the TC 103. Matra recently reached preliminary agreement with QWIP, Exxon's office system subsidiary, which may lead to distribution of the TC 103. In addition, Matra recently contracted with the Olivetti Corporation for commercial distribution.

French Advances in Telecommunications

France soon will have the most sophisticated and efficient telephone system in the world, according to the executives of the Matra Group. This organization, proud of its state-of-the-art technology, has grown from 5,000 employees to 33,000 in the past three years. Its stock on the Paris Exchange has performed even more spectacularly.

In June 1980, the French Telecommunication Authority (D.G.T.) awarded the Matra Telecommunications Branch a contract to provide an initial order of 500,000 electronic T 83 phone sets. These sets are paid to employ the latest electronic technology.

Features of the Matra T 83 phone sets include electronic key dialing, electronic chime, automatic dialing, amplified hearing, and an automatic last number redial. Over the next 10 years, it is planned that the T 83 will replace some 30 million existing telephone sets in France.



Data Terminal — This new Matra data terminal, derived from the company's Videotext Terminal, is said to be applicable to a wide array of data processing operations. One of its main features is an ability for direct connection to the telephone system for access to a variety of data banks.

Beginning in 1982, the D.G.T. will issue free to its telephone customers Videotext Directory Terminals which will be linked to computers. Matra is one of the firms that is developing hardware for this system. These terminals enable users to access directory information without operator assistance. The cost of operator-assisted directory inquiries has been a major telephone expense throughout the world. Installation of the Videotext Electronic Directory will substantially reduce operating costs for the French telephone system.

Another new item in the modernization of the French telephone industry is the development of the Matra Videotext Teletel Terminal. This new terminal easily connects to any existing black-and-white or color television set and integrates with Teletel, Videotext, and other service data banks to provide a wide range of information. Matra is a major part of the organization established to create the data center and its interface with the French telephone network.

One additional significant development of France's national telephone system is a satellite program, with the first French telecommunications satellite named TELECOM 1. Matra is prime contractor for three satellites in the program, the first of which is due to be launched in 1983. TELECOM 1 will provide the French with a variety of new communications services, including data transfer between computers, video conferences, video transmission, and high speed telecopying. It will also be used for both telephone and television links with Reunion, French Guiana, Martinique, and other areas of the world where French is spoken.

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**SID CALENDAR
JANUARY TO SEPTEMBER 1981**

1981		
January	13-14	SID 1981 International Symposium Program Committee Meeting Grand Hyatt Hotel, New York, NY
	15	Proceedings, Volume 22, No. 1, 1981, Mailed
	20	Quarterly Chapter Rebates Mailed
February	9	National Ballot Mailed
April	1	Proceedings, Volume 22, No. 2, 1981, Mailed
	6	National Ballot Return Deadline
	20	Quarterly Rebates Mailed
	20	Executive Committee Meeting
April	27	National Board Meeting, New York, NY
	27-	SID 1981 International Symposium
May	1	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		
January	12-14	Pacific Telecommunications Council, Honolulu
	12-15	Seminar on VLSI Technology, San Francisco (Palisades Institute)
February	9-13	SPIE Technical Symposium, North Hollywood, CA
	23-26	Computer Science Conference, St. Louis, MO
March	23-25	Office Automation Conference, Houston, TX
March	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 Retroflective Materials, Minneapolis, MN
August	17-22	5th International Congress of Cybernetics and Systems, Mexico City
November	9-11	Association for Computing Machinery Annual Conference, Los Angeles, CA

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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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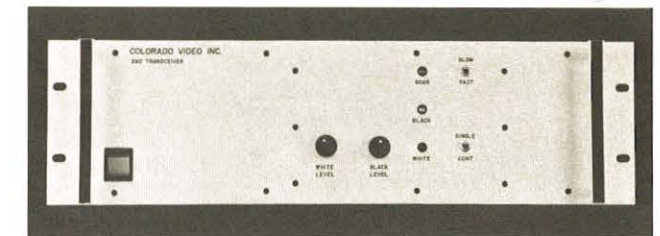
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Jim Fleming (left) and Paul O'Connor, researchers at Bell Laboratories, Murray Hill, make adjustments on the apparatus they use to fabricate preforms for the glass fibers used in lightwave communications. The new plasma technique substantially increases the fabrication rate for these fibers and is expected to make this promising new technology more competitive with alternative transmission media.

See story on page 18.



Slow-Scan TV Receiver

The Model 290 slow-scan TV transceiver is the latest in a series of teleconferencing products from Colorado Video, Boulder, CO. The 290 is designed for the transmission and reception of still television images over the ordinary dial-up telephone system. It allows immediate visual usage of this world-wide network.

64K memory components are said to provide high performance with relatively compact equipment size. Designed with systems flexibility in mind, options include: transmit only, receive only, and frame grab only functions. Other special features include multiple memories for simultaneous viewing of up to four pictures, or rapid recall of earlier received images, and choice of picture resolution of 256 x 256, 256 x 512, or 512 x 512 elements per image.

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General Motors Aims at Using Fiber Optics

A typical 1981 General Motors compact car contains enough electrical wire to stretch up and down a football field four times with more than a hundred feet to spare. Current-day requirements for safety, emissions, fuel economy standards, and convenience features on autos dictate the need for more complex wiring and electronic controls. This has to be accomplished while shrinking the exterior dimensions of the cars.

Multiplexing offers a solution to these problems, according to a Society of Automotive Engineers technical paper recently prepared by GM engineers. The report, "Multiplex Systems for Automobiles," was written by Dan R. Kimberlin, Saginaw Steering Gear Division, Robert A. Meade, Packard Electric Division, and Wesley A. Rogers, GM Engineering Staff.

A joint effort within GM has resulted in a time division multiplex (TDM) system using the steering column, door, and seat controls as the vehicles for design studies and hardware implementation.

TDM transmits signals during designated time intervals on a single information channel. Signals formerly routed on scores of individual wires in a car can be time-shared on a single link. The TDM system consists of an encoder connected to command switches and a decoder that receives the command and conveys it to the appropriate electrical components such as automatic seats, cruise control, windshield washers, lights, etc. The encoder and decoder are connected by a single wire or data link. Thus savings in wiring harnesses are achieved.

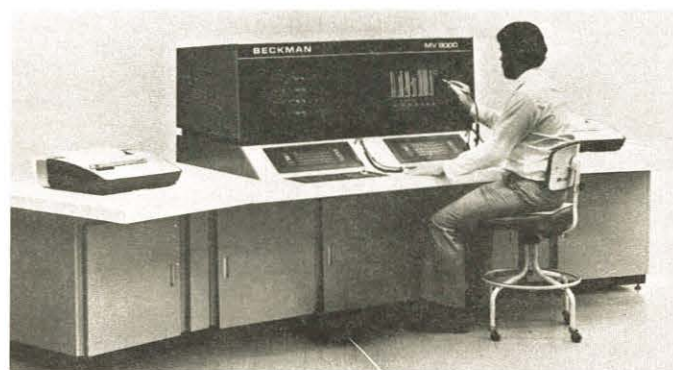
The encoder sequentially samples local input signals and sends the signals in repetitive, sequential time slots along the data link to the decoder where the signals are separated out and converted to the system output. (Editor's Note: SID aerospace engineers have been familiar with this technique for many years.)

Encoders and decoders can be located in strategic positions in the car, the engineers illustrated in the report. A variety of encoder/decoder configurations is being investigated.

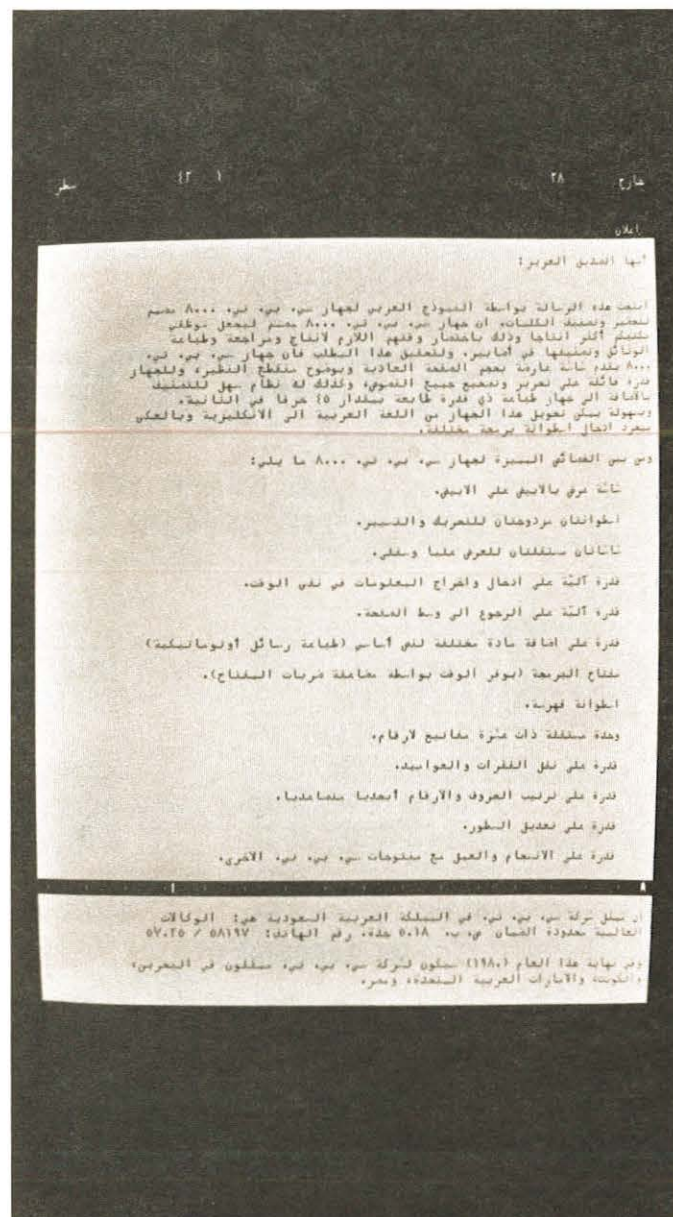
Increasing concern about electromagnetic interference (EMI) in the environment prompted the engineers to test a multiplex-equipped vehicle linking the encoder/decoder with fiber optics. Two such vehicles, dubbed "Optiplex", were built.

Using the optiplex system requires converting electric signals to light pulses and back to electrical signals. The report points out that the optiplex system permits relative ease of servicing and is immune to — and does not emit — EMI. It also provides flexibility of design; permits smaller control buttons; does not drain current from the battery with the ignition turned off and enables certain functions to be operable with the ignition turned off.

The paper cautioned, however, that multiplex technology is a recent arrival in the automotive technology area and that non-optical multiplex systems are destined to precede optional versions into production.



Coal Gasification Process Control — This Beckman MV 8000 advanced distributed control system will control a unique coal gasification process for Rockwell International. The process, carried out by the Rockwell-developed hydrogasification reactor now being tested in Canoga Park, CA, converts the carbon in coal to liquid and gaseous products that can be used either as liquid fuels or as petrochemical feed stocks. The Beckman system is to provide total control of the hydrogasification reactor, the flow of oxygen, and hydrogen, temperature and pressure levels, and the conversion data from the reactor.



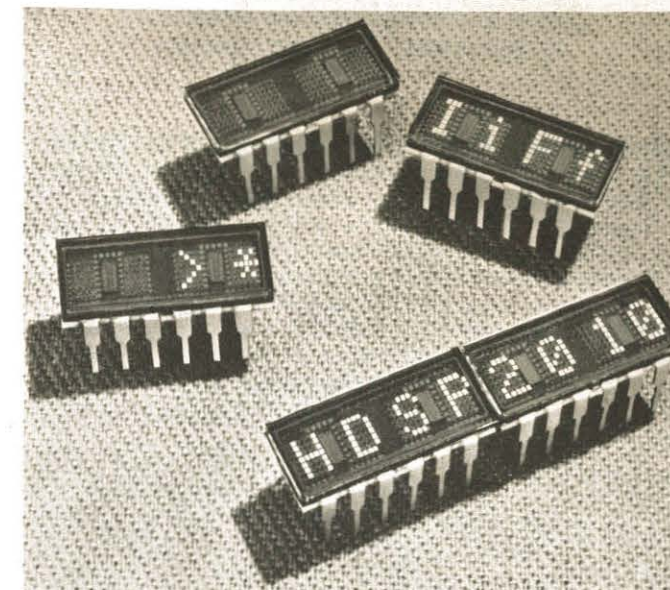
CPT's Arabic word processing system simplifies the task of creating printed documents in the Arabic language. The CPT 8000 system, with Arabic Keyboard, is made in Minneapolis.

New Alphanumeric Display With Extended Temperature

This new compact alphanumeric display from Hewlett-Packard, Palo Alto, CA, the HDSP-2010/TXV-2010, is intended for military, space, medical and industrial control applications where high reliability is required. Its operating range of -40°C to $+70^{\circ}\text{C}$ is guaranteed by a special selection of the on-board integrated circuit. Heat sinking techniques can extend the upper temperature range to $+85^{\circ}\text{C}$ according to H-P engineers. Additional information is available in Application Note 966, available from Hewlett-Packard free of charge.

The HDSP-2010 and TXV-2010 are based on Hewlett-Packard's compact 5 by 7 dot matrix alphanumeric component produced for the past four years. Integrated shift registers and constant current drivers are also said to be unique to the HDSP-2000 family and to simplify design effort.

The new family member, the HDSP-2010, has a guaranteed leak rate of 5×10^{-7} cubic centimeters per second and is temperature cycled from -55°C to $+100^{\circ}\text{C}$. The TXV-2010 is subjected to the standard military screening program.



New RF Field Sensor System Offers True-Reading Isotropic Response

While most field strength instruments are made for power density (planewave) measurements, most RFI and EMI tend to occur in the near field. A new system offered by Amplifier Research, Souderton, PA, uses balanced, isotropic probes that respond to any incident field, regardless of polarization, allowing a true summing of all incident electric or magnetic fields in the frequency spectrum from 1 MHz to 500 MHz.

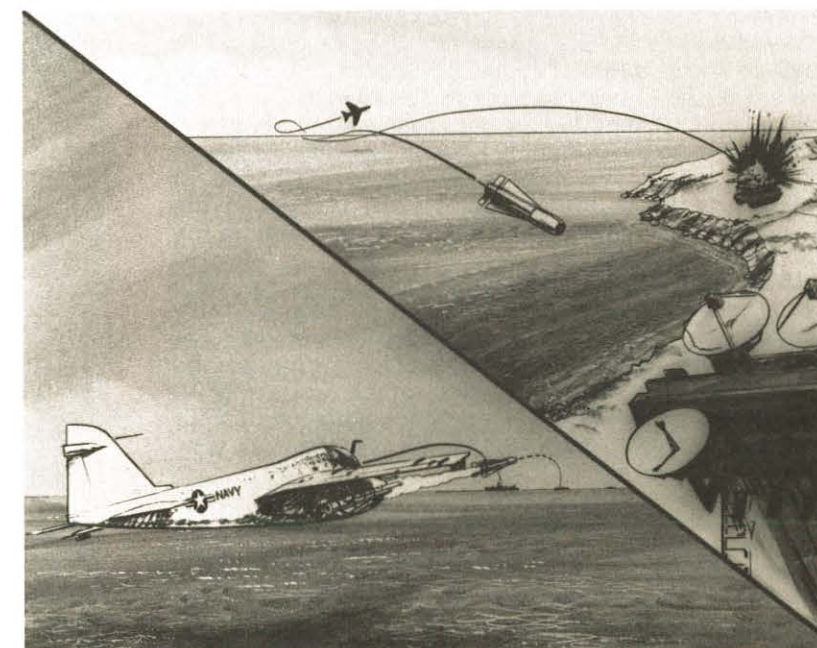
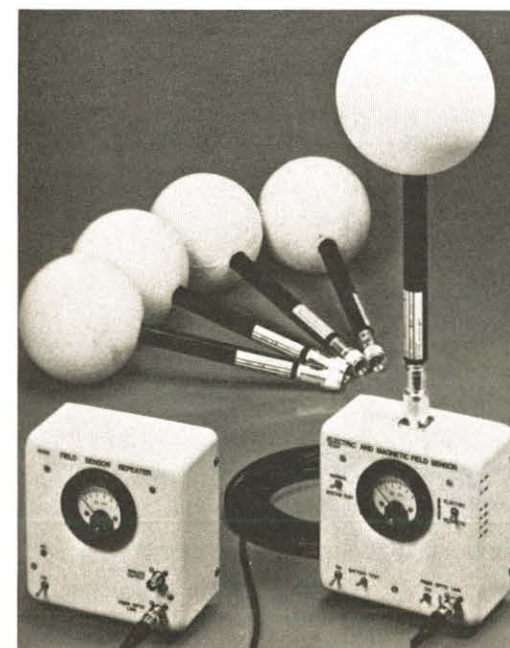
The system includes a completely shielded metering instrument with separate sensor probes, and a field sensor repeater that is connected to the metering instrument via fiber-optic cable. Three sensor probes cover electric field strengths from 10 to 100 volts/meter full scale, and two cover magnetic fields of 1 and 10 amperes/meter full scale.

In practice, the field to be measured surrounds the metering instrument and sensor probe; the reading appears directly on the instrument's meter. The repeater

unit allows isolation from the incident field for readout at a remote location. The system is used in EMI susceptibility testing to monitor the rf field, in antenna evaluation and field pattern measurement, in diathermy and industrial equipment radiation measurements, and in similar other areas where a true reading of total incident radiation is required. The package is compact. Metering instrument and repeater each measure 15 cm X 15 cm X 9 cm.

The system, manufactured in Italy by Aeritalia, is sold and serviced in the U.S. by Amplifier Research. The system includes the repeater, fiber-optic link, and five probes.

NAVY MAVERICK — Two primary applications of a new version of the Maverick air-to-ground missile being developed for the U.S. Navy are illustrated in these artist's concepts. In the lower left, a Navy A-6 in a low level ocean attack at long range launches a second Maverick at an enemy ship while a missile fired just seconds earlier nears the first target. In the upper right, a Navy A-7 veers away after firing two of the launch-and-leave Mavericks at air defense installations. The AGM-65F Maverick under development by Hughes Aircraft Company, Canoga Park, CA, provides selectable warhead fuzing to optimize its effectiveness against various sea and land targets.



MDS Software Package Certified For Use In Third Federal Reserve District Automated Clearing Houses

Data communications software developed by Mohawk Data Sciences Parsippany, NJ, for automated clearing house applications has been accepted for use in the Third Federal Reserve District.

The approval came from the Federal Reserve Bank of Philadelphia which, after stringent testing, certified the package for use in transmitting data to and from the Fed. The package, called ACH COMM, was developed specifically for automated clearing house (ACH) applications, in compliance with guidelines provided by the Third District Funds Transfer Association, which administers automated clearing houses in the Third District.

Three banks in the district have already leased MDS SERIES 21 data processing equipment and are presently testing the software package. The Commonwealth National Bank of Harrisburg, and the American Bank and Trust Company of Reading, are using MDS System 21/40s with 64K random access memory, one CRT display, two diskette drives, 45 character-per-second printers, nine-track magnetic tape drives, and 2000 to 4800 bit-per-second communications capability. The First National Bank of South Jersey, located in Pleasantville, presently has a similar System 21/40 installed, but with a 340 line-per-minute printer and more sophisticated communications capabilities. Two more systems will soon be in operation.

Automated clearing houses serve as batch payment processing systems where the user, usually a bank or company, authorizes the direct deposit of payments to banks dispersed over a wide geographic area. The payments are made to the account of an employee or benefit recipient who has authorized the company to do so. Although the physical paycheck is eliminated, the employee receives his pay stub noting the amount that was deposited directly to his account.

Typical applications for automated clearing houses are payrolls, distribution of government benefits, and payment of dividends to shareholders. For many years, the information processed on magnetic tape at the corporation or government agency has been physically transported to the local bank by armored truck. The bank merges the information on this tape with other payroll information it has received during the day, and sends it, again by armored truck, to the automated clearing house for distribution. There it is separated into inter-regional and local transactions and transmitted, in the case of inter-regional transactions, to other Federal Reserve Districts via leased telephone lines. The local payments, in the form of magnetic tapes or printed output, are trucked to the individual banks where the payment is deposited in the account of the recipient.

MDS SERIES 21 equipment and customized data communications software, it is said by Mohawk, will eliminate the over-the-road transportation of data between the bank and the automated clearing house and thus greatly increase the efficiency of the process. MDS software is successfully being used for automated clearing house applications in Richmond, VA, Boston, and New York City.

William Burleigh, executive director of the Third District Funds Transfer Association, predicts that automated clearing house processing of the future will be far more automated than at present. "We envision, very rapidly, perhaps within the next year, to have just about every major computer installation transmitting either by terminals or computer-to-computer links," said Burleigh.

Sanders Provides Video Training Systems for Army Weapons Use

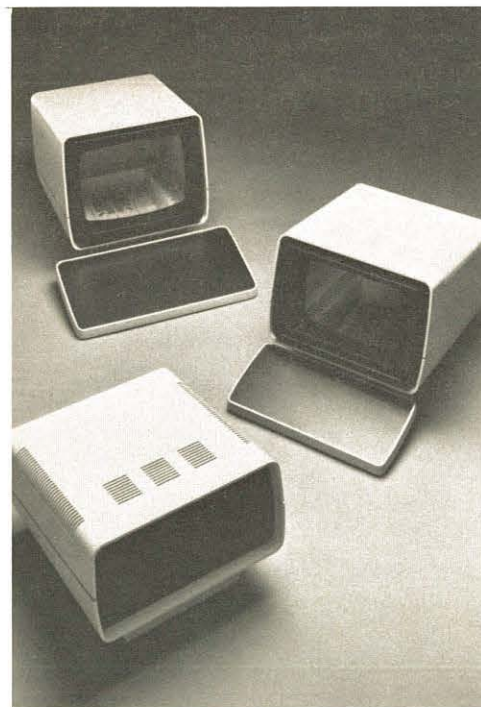
A computerized training system that enables actual shoulder-held antitank weapons to be fired electronically at videotaped targets with accuracies comparable to those produced by live ammunition firing has been developed by Sanders Associates, Inc., Merrimack, NH.

Called a combat classroom, the prototype version is an interactive video training system that employs an M7 2A2 Anti-Tank Weapon with electronic sensors that "see" specially encoded aim points nested in a videotaped scene of a tank moving through mountainous terrain. The weapon's ballistics are programmed into the system's microprocessor, resulting in aim accuracies comparable to the actual weapon.

Sanders has recently also received a contract from the U.S. Army Project Manager for Training Devices to adapt this firm's interactive video technology into a demonstration model training device for aiming and sighting the 165 mm howitzer on the Army's combat engineering vehicle. The prototype pedestal/turret mounted trainer will feature a representation of the gunner's compartment designed with appropriate sighting and control equipment.

The combat classroom, which is expected to reduce considerably the costs of training weapons operators, can also be adapted to main gun fire controls, part task trainers, etc. Because aim accuracies are comparable to the actual weapon, it is said to eliminate the need for live ammunition and energy-consuming targets, while simultaneously increasing safety during the training process.

David L. Jordan, director of development at Sanders Defensive Systems Division, said the new system provides an economical, safe process for trainees to obtain "hands on" experience with actual weapons as well as maintenance skills training. The system can be programmed for various levels of training from basic to advanced.



Shown are three possible assemblies from Hettinga Series 700 components. A total of eight components, including one base, make up the Series 700. Manufacturers of CRT terminals can vary the shape and size of the units to create a customized design.

Hettinga Introduces Standard CRT Unit To The Electronics Industry

Hettinga, Inc., Des Moines, Iowa, a plastics research and development company, is now offering foam-molded CRT housings to the electronics industry. The Series 700 housings are available with components that may be varied to customize the units.

The internal base of the Series 700 has a grid area that easily adjusts to many different components and layouts, making it useful to original equipment manufacturers, says Dr. Diebolt Hettinga, president of the plastics company. A natural interior overhang can also be bridged to form different configurations.

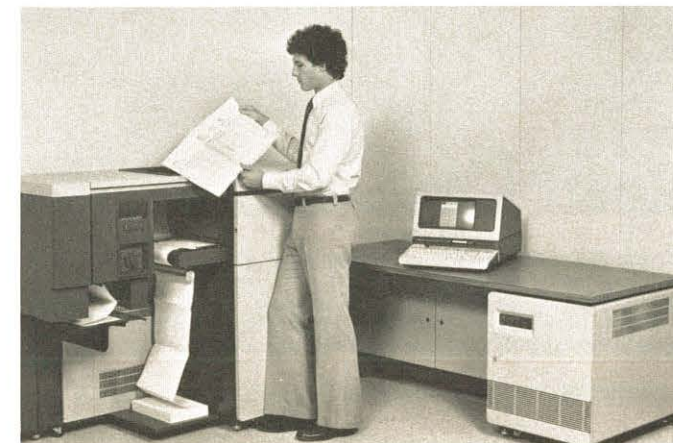
Other features of the Series 700 include style-keyed components that give assemblies continuity and two size keyboards. The unit can be built to accept standard alphanumeric or added numeric pads. Up to 116 keys can be accommodated. This CRT housing meets government standards on V-O ratings.

The Series 700 housings are said to be manufactured through a unique molding method—the Hettinga process—using low pressure injection resulting in products with low inherent stress and good dimensional stability.

Hettinga has joint venture partners in England, Canada, and India, and also sells equipment to in-house molders in the United States. Hettinga, Inc. continues as the research and development arm of the company and manufactures a proprietary line of molded products.



This new Hewlett-Packard Model 3060A Option 100 system tests complex microprocessor circuit boards.



Hewlett-Packard HO 2680 laser printing system functions under control of HP 3000 series 44 business computer system.

H-P Executive Announces Computer with 99% Uptime Service Agreement

"The U.S. computer industry is going to retain leadership in the international trade contest," said Paul C. Ely, Jr., Hewlett-Packard's executive vice president, at a recent press conference in Cupertino, CA. "We accept the challenge. We think the competitive edge during the 1980s is going to be quality, reliability, and what the computer users call 'uptime.' For the first time in the industry, Hewlett-Packard offers a computer with a service agreement that guarantees 99% uptime."

Ely was referring to the introduction of a new HP business computer twice as powerful as its earlier counterpart, yet only five percent higher in price. "What we are demonstrating here today is not only the U.S. computer industry's ability, in the face of inflation, to continue to offer more and more performance for the money, year after year. We also accept the quality challenge. We think the best demonstration of quality that a computer manufacturer can make is a guarantee the product will keep working after it is installed. So HP is offering purchasers of the new HP 3000 Series 44 a money-back guaranteed uptime service agreement stating that the critical elements of the system will stay up and running 99 percent of the time. That, so far as we know, is a first for the industry," Ely stated. "To offer such a service guarantee, we have to be so sure of the product's quality that we are confident almost all our users will experience better than 99 percent uptime. This computer was designed in a new way, with a new and higher level of reliability as the goal. That goal was met in several ways. Built-in are tests that can be ordered remotely through telephone lines, so that the servicing engineer can know what is needed before leaving the shop. Tens of thousands of hours went into reliability measurements before the first production model was built. After months of working with suppliers, we chose the most reliable components available."

The computer described by Ely is a new top-of-the line HP 3000. These computers are said to function alike, use one another's programs, communicate with one another, and to be upgradable after purchase from smaller to larger, and from older to newer versions. "Among general-purpose business computer models," said Ely, "the HP 3000, with more than 5000 installations, is one of the most popular."

"The position that the HP 3000s have assumed in this business is based on their usefulness in distributed computer operations, where numerous computers are located throughout the organization, near the people who are most responsible for the integrity of the information their computers are processing. The ability of all the HP 3000s to intercommunicate, to share files and use one another's programs, printers, and other resources, is an ability that is crucial to the success of distributed systems."

"Equally important to their success has been the assurance shared by all users that their investment in programming is being protected by HP. Billions of dollars have been spent on programs for HP 3000s, and it is HP's strategy to see that new 3000s will run them."

"Then, too, the whole series of HP 3000s that began with the CX in 1974 are upgradable to higher-performance systems, including the Series 44, supporting our promise that we will continue to provide logical upgrade paths for HP 3000 users, to meet their needs as they grow, and to reaffirm the value of their hardware investment."

Qualex High-Density (6250 bpi) Tape System Now Available for HP 3000 End Users

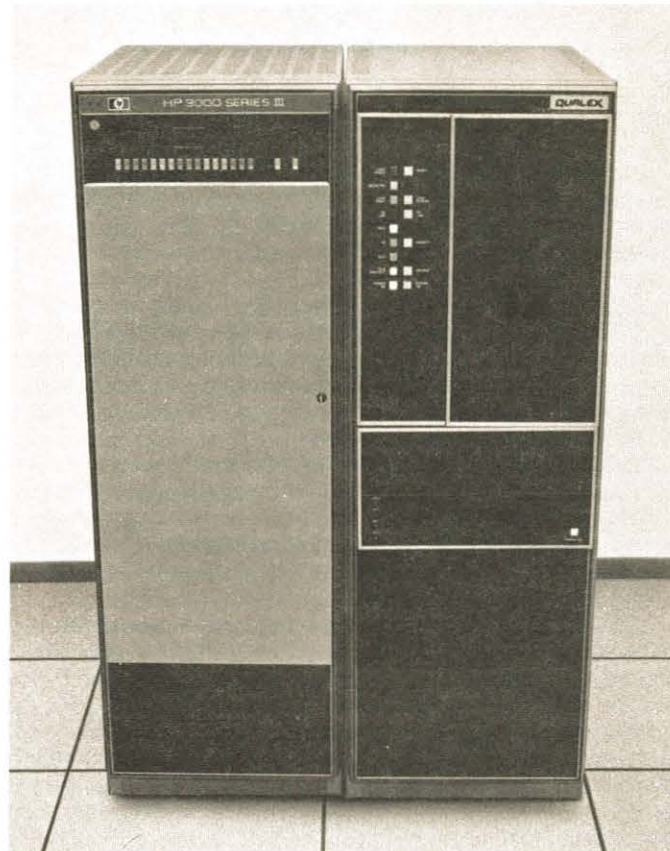
WESTLAKE VILLAGE, CA — The Qualex Group, Westlake Village, CA, 3000 high-density 6250 bpi tape system is now available for HP 3000 end users. This system was originally designed for OEM use and has been fully tested in field operations over the past year.

The Qualex Group 3000 is said to be one of the industry's highest performance tape systems with 6250 bpi group-coded recording (GCR) and a 125 ips transport speed.

Other features include NASI/IBM compatible, radial interface for up to eight drives per controller, plug and program compatible with HP 3000 Series II and III, auto thread/load for open reel and cartridge, and switch-selectable dual or triple density (800, 1600, 6250 BPI).

These and other features allow the Qualex Group 3000 to provide up to an 8-to-1 storage compaction, 20-to-1 time saving in disk backup, 3-to-1 improvement in rewind speed, better than 4-to-1 reduction in operator overhead, and a 4-to-1 improvement in system efficiency with two-track error correction "on the fly", the manufacturer states.

The Qualex Group 3000 high-density 6250 BPI tape system (right) is now available for HP 3000 users.



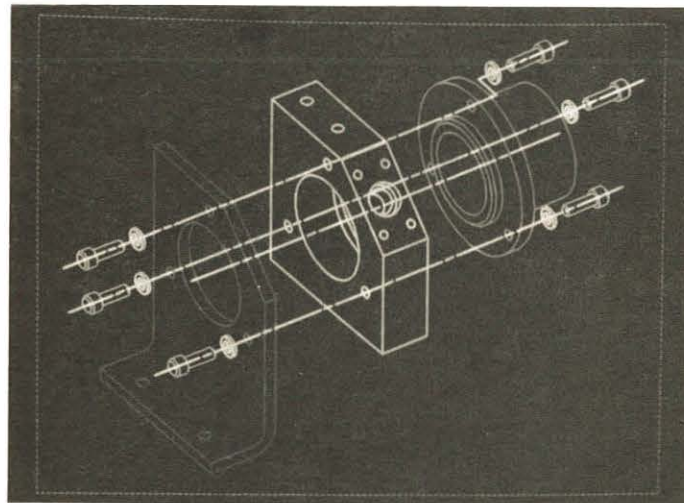
Calma Supplies High-Resolution Graphics For Designing Mechanical Assemblies

Calma, Sunnyvale, CA, a leading CAD/CAM innovator, is now displaying its 3-dimensional graphics system on high-resolution color and black-and-white monitors with extensive software for mechanical products applications.

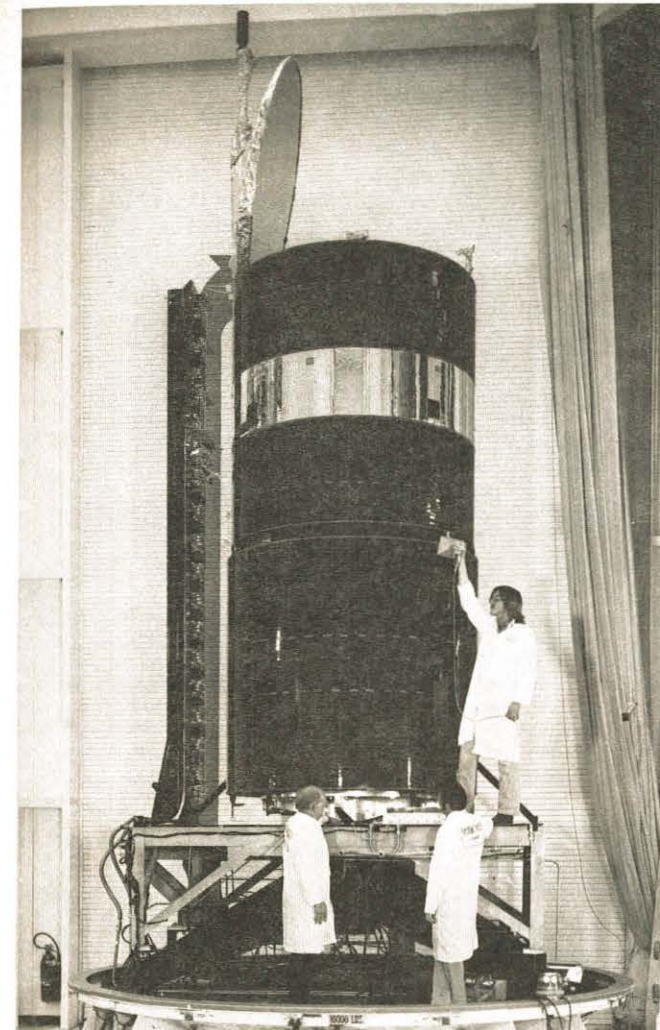
Originally introduced 14 months ago, Calma's 1024 x 1280 line high-resolution color system is said to provide five times the industry standard for resolution of 512 x 512. It offers a selection of 4,096 electronic colors.

While annotations, dimensions, and other pertinent information can be shown clearly with the design on the CAD screen, Calma's human-engineered work station provides a separate screen for alphanumeric messages.

According to Lynette DeNike, Calma offers the fastest system on the market with the most extensive variety of mechanical applications software including: 3-D design, drafting, two- through five-axis numerical control, finite element modeling, piping design, schematics, flat-pattern development, parts nesting and N/C flame cutting, and die design.



3-D COLOR EXPLOSION — An exploded view like this bearing-mount assembly design is said to be only one of many innovative features seen in Calma's CAD/CAM systems. This 1024 x 1280 line resolution color system is one of the industry's fastest and most versatile systems for computer-aided design and manufacturing.



FIRST OF A KIND — The new SBS communications satellite, scheduled for launch Nov. 15 from Cape Canaveral, Fla., undergoes a test at Hughes Aircraft Company, El Segundo, Calif. The first of a series of three, the satellite was built for Satellite Business Systems, jointly owned by IBM Corp., Comsat General Corp. and Aetna Life & Casualty, to provide secure voice, video, data and facsimile service to U.S. businesses. The powerful satellite (above) has two concentric cylindrical solar panels, and expands in space from 9 feet (282 cm) to nearly 22 feet (660 cm) high, to double the spacecraft's solar-power generating capacity over many previous satellites.

New SBS Satellite Can Bring New Era For U.S. Business

The first of a new breed of communications satellites, designed to provide secure voice, video, high-speed data and facsimile services to U.S. business firms and industries, was recently launched at Cape Canaveral, FL.

The powerful new satellite is called SBS, standing for the name of its owner, Satellite Business Systems, a private company jointly owned by IBM Corporation, Comsat General Corporation and Aetna Life & Casualty. It is expected to begin commercial operations early in 1981.

The satellite, the first of three being built by Hughes Aircraft Company's Space and Communications Group at El Segundo, CA., was launched by NASA on a Delta rocket into a geosynchronous orbit 22,300 miles over the equator at 106 degrees W. longitude, roughly south of El Paso, Texas.

The second SBS will be launched in April 1981 and the third in November 1982.

Hughes also is building 100 earth terminals for Satellite Business Systems. Delivery of the terminals has already started, and is scheduled to be completed in 1982.

The satellites will operate in conjunction with these earth terminals, designed to be installed on the roofs of buildings or on adjacent ground, providing Satellite Business Systems' customers with direct access communications with their own or other business firms nationwide.

The SBS satellite, the first to be launched of the Hughes 376 spacecraft series, has two concentric cylindrical solar panels, the outer of which extends nearly six feet downward in space. This capability of expanding in space doubles the spacecraft's solar-power generating capacity over many previous satellite models. Improved solar cells also enhance the generating capacity. Antenna systems, located at the upper end of the spacecraft, unfold and deploy in space.

The satellite is 7 feet in diameter (216 cm) and more than 9 feet (282 cm) high in its "stowed" position, but when it expands in space it reaches nearly 22 feet (660 cm) or two stories in height.



New R-value meter from Barnes Engineering Co.

The First Direct-Reading, Non-Contact R-Value Meter Introduced By Barnes

Barnes Engineering Company, Stamford, CT, has announced the development of an R-value meter for use in energy-conservation and heat loss monitoring. The R-Value Meter is a non-contact, direct-reading instrument that will enable energy auditors, insulation contractors, building inspectors, and maintenance personnel to measure heat loss in energy-management and preventive-maintenance programs.

R-value, or thermal resistance, is the standard index for the insulation efficiency of a building or an insulating material.

The new R-value meter is used with the Barnes Instatherm®, a non-contact thermometer that measures infrared energy to determine surface temperatures. Infrared thermal detection is a quick and practical method for comparing variations in surface temperatures. It also permits measurements when physical contact is either impossible, hazardous or undesirable. Now, through direct R-value reading and non-contact temperature measurements, energy auditing procedures can be improved and simplified.

Crydom Remote Input/Output System Reduces Installed System Costs

A system that is said to link almost any mix of remote electrical motors, process and environmental controls, analog signals, alarm and security monitors, and other data and control points at a fraction of the cost of a conventional distributed data system has been announced by the Crydom Division of International Rectifier, El Segundo, CA.

Aimed at the industrial and commercial user who may or may not have a control computer in place, the new product line is called RIOS™, for remote input/output system. A single RIOS installation can have up to 127 stations along a mile of cable with more than 2000 data or control points.

According to Vern Gregory, Crydom's director of research and development, RIOS attacks the usual high installation cost of multiple remote stations and special hardware by employing microprocessor-based modules, low-cost cabling and simple supervisory commands.

In RIOS, each microprocessor-based remote station can interface to industrial equipment such as power systems, motors, sensors, actuators and heaters, and to analog instrumentation and controls via multichannel A-D and D-A converter modules.

RIOS is designed to operate on any one of three levels: (1) under control of individual remote stations using ROM-stored programs; (2) with RIOS controller issuing all supervisory commands; and (3) master control by a user-supplied computer.

Gregory says that each RIOS remote station can accommodate 16 input/output lines; with the maximum 127 stations in a single system, more than 2,000 data or control points could be monitored. "RIOS system architecture is designed so that stations are easily expandable. A single system can accommodate any reasonable number of data or control points," he declares.

Communication with remote RIOS stations is via a bit-serial party line cable. Only three elements are needed to build a system of stations: a controller/driver, the twisted-pair cable itself, and addressable remote interface adapters or RIAs.

The microprocessor-based RIAs serve as station building modules and convert serial cable messages into parallel data for interfacing with A-D and D-A converters or with input/output modules which interface with AC and DC power and signal systems. In addition, each RIA contains a 2 Kbyte ROM to store user-defined instructions.

Peripheral interface adapters (PIA) within each RIA handle all parallel interfacing and are connector and pin-out compatible with Intel and other single board computers. A parallel interface assures that existing user equipment can be easily linked to RIOS stations.

According to Gregory, design of RIOS system architecture and its command and communication protocol has been targeted on flexibility and essential industrial communication/control factors and functions.

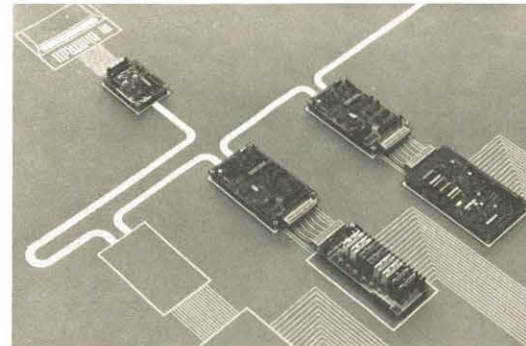
These include high noise immunity, tradeoffs in noise inhibition vs. throughput rate, watchdog timer, counters, timing functions, and A-D and D-A conversion, as well as the interface to power systems through Crydom's buffered input/output modules.

Digital display of board status and advanced features such as error counting reportable to a central processor aid system diagnosis and maintenance, Gregory points out.

The RIOS system communicates by using a standard asynchronous 11-bit format of a start bit, 8 data bits, a parity bit, and a stop bit. End of message is a short space at the end of each message or reply, increasing throughput by eliminating reserved control symbols. Communication

over the mile-long party line cable is at 9600 baud using RS-422 differential signaling techniques.

RIOS modules are designed for mounting in standard NEMA enclosures, putting system wiring in an environment familiar to electricians and field personnel as opposed to conventional electronic hardware with card cage construction.



Cost of distributed data goes down. New Rios™ (remote input/output system) from Crydom Division, International Rectifier, El Segundo, CA, uses microprocessor-based modules with standard parallel interface, low-cost cabling to slash cost of distributed data and control, the firm states. RIOS has up to 127 stations on mile of cable. Shown here are RIOS transistor board for computer interface, two typical remote stations with identical Remote Interface Adapters and (left) board with eight Crydom input/output modules for power systems hook-up and (right) A-D/D-A board for instrument and control interface. RIOS can operate with a customer's computer or as stand-alone system.

Gregory explains that the microprocessor common in all RIOS boards or modules makes RIOS capable of standalone operation.

"Rather than conceiving of a RIOS system as a slave to a central processor," he says, "it can be thought of as a hierarchy based on standalone controllers. Thus, a system can operate with or without commands from a central processor."

The Crydom research director declares that the architecture of a RIOS system provides for a manual interface adapter, or MIA, a feature usually not provided in remote input/output systems.

Coupled to a RIOS controller board, an MIA provides manual control or backup through user-supplied manual switches and status lights. An MIA can also control an entire system in a manual mode as a standard means of operating in addition to its use for maintenance and system test.

Gregory says that major applications of RIOS are wherever cost of installation is a large component of total system costs. He cites as examples energy management, building security and alarm systems, and extensive production processes with manufacturing areas such as refineries and food processing plants. He predicts that in most of these applications, the cost of the RIOS hardware would be more than offset by the substantial savings in wiring and installation costs.

Gregory also notes that in many installations, separate systems such as security and intercom could be combined into RIOS at small incremental cost, demonstrating the greater total savings when RIOS is used for all the applications within a facility.

Delivery of RIOS hardware will begin in January 1981. The basic evaluation system includes a translator board for interfacing RIOS to a user's computer and two station modules or remote interface adapters (RIAs), a mounting board for eight I/O modules, and an A-D and D-A converter with 16 A-D and 2 D-A channels plus cables.

Crydom officials say that customer seminars are planned in most major cities to introduce the new RIOS products. These seminars are expected to start in late January.

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New Features added to GTD-120A Digital PABX

General Telephone and Electronics, Northlake, IL, is announcing three new features now available on the GTD-120A digital PABX.

Quicker and easier changes can be made in the system's data base through two of the features — English language recent change (ELRC) and on-line diagnostics.

With ELRC, users wanting to change the data base may simply key in an access code on a CRT and a "menu" of possible changes appears on the screen. After the user has made a selection from the "menu", ELRC prompts the person through the change procedures with simple, English-language questions. This eliminates the need for users to have specialized computer knowledge in order to change the data base. The data base can be changed either locally or remotely.

The on-line diagnostics feature is a maintenance aid which can also be performed on site or from a remote location. By use of a teletypewriter or CRT, a service center may remotely diagnose system problems.

This on-line diagnostics feature saves money, GTE's Len Boscarine says, because it allows service personnel to arrive at the customer site knowing what the problem is and what parts they must have with them in order to fix hardware malfunctions. Should the problem involve the system's software, it can be corrected by personnel at the service center. With software problems, there's no need to send service personnel and equipment to the customer site.

The third new GTD-120A PABX feature allows the telephone system to be connected to a message detail recorder (MDR). The use of an MDR permits management studies and control of telephone usage on a group or line-by-line basis. This serves as a deterrent to unauthorized or excessive toll charges.

The GTD-120A digital PABX is the latest version of one of the best-selling small telephone systems on the market, with over 6,000 organizations relying on the GTD-120A PABX for their telephone service. With totally-electronic operation and state-of-the-art techniques such as time



The attendant console for the GTD-120A digital PABX is designed to complement any decor, GTE officials say, while it provides micro-processor-assisted efficiency in handling telephone calls.

division switching, the GTD-120A PABX is said to be increasing telephone system efficiency in office and factory complexes, government offices, hotels, school systems, medical facilities, hospitals and department stores.



Nuclear Inspection System — Babcock & Wilcox, Lynchburg, VA, data acquisition equipment records profilometry probe measurements on magnetic tape and strip charts. Data analysis equipment reduces the information to numeric estimates of strain and then plots tube profiles. This is part of B&W's nuclear inspection system to avert unnecessary tube plugging in nuclear power plants.

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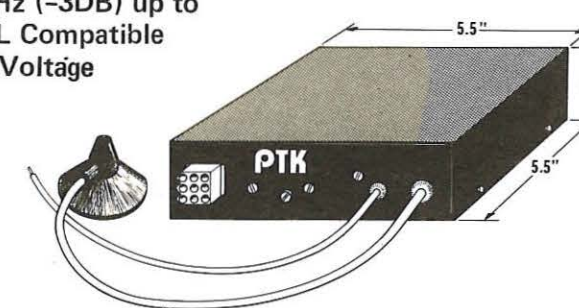
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German Savings Bank Installing Large Bunker Ramo Terminal System

Bunker Ramo Corporation's on-line bank terminal system, Bank Control System 90R, has recently been installed by Germany's second largest savings bank, Landesgirokasse Stuttgart, Germany. All 257 offices throughout the German state of Wurttemberg are equipped according to Walter Clark of Bunker Ramo, Trumbull, CT.

Some 600 teller work stations have been equipped with keyboard/display terminals, passbook/document printers and bank card readers operating on-line to the bank's mainframe computer in Stuttgart. Each branch is equipped with a control unit for local processing and interfacing with the central computer, handling all standard teller transactions and other banking functions. Installation and service is handled by Bunker Ramo Electronic Data Systems GmbH of Munich, a subsidiary of Bunker Ramo.

About Landesgirokasse Stuttgart

Landesgirokasse has been a user of on-line electronic data processing systems for more than 10 years and plans to use the advanced Bunker Ramo bank terminal systems throughout the eighties. The bank had a 1979 year-end balance of more than \$7.2 billion.

Details of Equipment and Operations

The teller communicates with the system through terminal consisting of an alphanumeric keyboard and a 5-inch diagonal CRT display screen. With this unit, the

teller can retrieve account information and enter new transaction data. The terminal also controls the passbook/document printer which is equipped with a dual line matrix printhead that enables OCR-A character printing. The bidirectional 140 character per second printer is said to be much faster than the "daisy wheel" printers usually employed for such high quality printing tasks. The printer also is equipped with a magnetic stripe read-write feature in the document insert slot. This feature provides for the count number to be read from, and the recorded balance to be updated on, the magnetic stripe affixed to the customer's passbook, during transaction processing. Magnetic stripe and coding is per DIN 32744. Also online to the system at each teller station is a bank card reader, initially used for teller identification and planned by the bank for customer use. Customer cards are to be identical to the Eurocheque cards specified for German cash dispenser pools and other interbank transactions. The card's magnetic stripe is coded on Track 3 in accordance with ISO and German DIN standards.

There are two types of control units in the systems. Eighty of these units are called PCUs (programmable control units), each with 136KB direct access memory plus 500 KB of auxiliary storage in two floppy disk drives, and a direct on-line connection to the bank's host computer center in Stuttgart. The remaining control units have minimal capacity for storage, but communicate with the system through shared PCUs. All terminals in the system can operate off-line from the host connection if necessary. They handle savings, demand deposit, credit, and currency exchange transactions. In addition, the system is designed to handle decentralized text processing and electronic payment transfers.

RCA Issues New Photomultiplier Handbook

LANCASTER, Pa. — 180-page handbook, the PMT-62, prepared to help designers and operators of photoelectric equipment gain a better understanding of photomultiplier tubes, has been released by RCA Electro-Optics and Devices, Lancaster, PA.

The handbook includes information on the design, construction, and theory of operation of photomultipliers. Characteristics covered include those related to the photocathode, gain, dark current and noise, time effects, pulse and scintillation counting, and environmental conditions. Specific applications discussed include scintillation counting, Cerenkov radiation detection, time spectroscopy, oil-well logging, gamma-ray cameras, computerized tomographic X-ray scanners, position cameras, photometry, spectrometry, Raman spectroscopy, fluorometry, laser range finding, and image scanning.

The appendixes include a glossary of terms, several sections dealing with light and radiant energy measurement, spectral response designation systems, photometric and radiometric units, spectral matching, radiant energy sources, and a selection guide.



Bell Labs Research Advance Speeds Lightguide Fabrication

Researchers at Bell Laboratories, Murray Hill, N.J. have devised a method to increase substantially the rate at which glass fibers used in lightwave communications can be fabricated. The new technique is expected to make this promising new technology more economically competitive with alternative transmission media.

The researchers, Jim Fleming, John MacChesney and Paul O'Connor, have done this by using a plasma — a highly energetic mixture containing ionized atomic fragments — to speed up "preform" production, an early step in the fabrication process.

"The plasma technique speeds up the making of preforms for glass fibers while maintaining the fiber's transmission properties," says Fleming. "Based on preliminary results, the preforms can be fabricated five times faster with this technique."

The new technique is a variation on the generally practiced methods of the modified chemical vapor deposition (MCVD) process. MCVD was developed at Bell Labs in 1973 and a patent for the process was awarded on August 12, 1980.

In the MCVD technique as commercially practiced, the glass "preforms" that are eventually collapsed and drawn to form lightguides are made by passing chemical vapors into a glass tube, where they are heated by a torch and form glass particles that are deposited on the tube walls. With the plasma-assisted process, instead of the vapors being heated only by an external torch, they are heated within a zone that includes a plasma formed and maintained inside the tube by electromagnetic energy generally produced by an induction coil.

"The plasma fireball supplies the energy that helps propel the glassy particles toward the walls of the tube," explains Fleming.

Since preform production is a significant part of fiber fabrication, increasing this rate should substantially reduce the cost of fabrication of fiber optics lightguides.

Additional Technical Information

The Bell Labs work is the first report of a rapid throughput, plasma-assisted glass-fiber manufacturing process that results in acceptable transmission losses.

The experimental plasma results show glass deposition rates of 2.5 grams per minute, speeding up the MCVD process as usually practiced. Transmission losses are only 3.4dB/km at 0.85 microns, and 1.5dB/km at 1.2 microns, comparable to losses with present techniques.

The plasma process also uses the reagent chemical vapors economically. For example, it uses over 70% of the germanium, the most expensive ingredient in the lightguide-forming process (compared with less than 5% with current techniques), and nearly 100% of the silicon.

Achieving both fast glass deposition and good transmission characteristics results from the way the plasma is used. The plasma fireball in one arrangement provides energy to the reactants, which form a cloud of glassy particles in a ring around the plasma. But the plasma in this arrangement is not directly involved in the sintering process, which incorporates these particles into a clear layer on the inside surface of the tube. Sintering is delayed until the particles are near the gas torch.

Fleming and O'Connor are able to control the chemical reaction, transport, deposition and sintering processes by techniques that include centering the plasma fireball within the tube and monitoring the temperature distribution in the region of the plasma. Studies at BTL on thermophoresis — the mechanism that largely determines how particles behave in a temperature gradient — helped to improve control of the deposition and sintering.

To form fiber with the same core-substrate geometry as is produced by the MCVD process without the plasma assist, only about one-fifth the time is needed for the deposition phase of preform preparation. The plasma-assisted process has been used to make both single-mode and multimode fibers.

Future research is aimed at combining the plasma approach with other recent advances in MCVD practice. Among these are substitution of phosphorus for boron, and use of a chemical purification system. These improvements have already led to decreased transmission losses for MCVD-produced fibers, particularly at the longer wavelengths likely to be used in future lightwave communications systems.

(See photograph on page 7.)



The new Model 560 Paper Tiger™ from Integral Data Systems is said to be the first full-width 132-column printer for data and text processing applications to offer high-speed, correspondence-quality overlapping dot-matrix printing.

Integral Data Introduces First Low-Cost, 132-Column Printer With High-Speed, Correspondence-Quality Printing

A printer said to be the first low-cost, full-width 132-column unit which can produce correspondence-quality overlapping dot-matrix characters at high print speed was introduced recently by Integral Data Systems, Inc., Milford, NH.

The new Model 560 is intended for data and text processing applications, prints bidirectionally at speeds up to 150 characters per second, sells for \$1,695 in unit quantities, and is about half the size and weight of most competitive 132-column machines, the manufacturer claims.

In addition to standard features including proportional character spacing, automatic text justification, variable character sizes and advanced forms control functions, the new top-of-the-line Model 560 addition to the IDS Paper Tiger™ family is one of few printers in its price range to offer a raster graphics printing option, Integral Data's president, Dr. James E. Vander May states.

"The demand for low-cost, high-performance printers with improved print quality will be a dynamic market through 1985, growing at a compound rate in excess of 30% annually," says Peter R. Eisenhauer, vice president of marketing. "The 560 will play an important role in that marketplace. It will be particularly attractive to computer system OEMs as an alternative to in-house manufacturing, and to large, multi-division end-user companies."

"The Paper Tiger 560 is perfect for high-volume data and text processing applications where better print quality and high speeds are required. These applications," Eisenhauer points out, "includes small business systems, distributed data processing network nodes and electronic mail, as well as a variety of business graphics including financial modeling and forecasting."

The Model 560 prints a full 132 characters per line at 10 pitch, with other pitches giving line lengths up to 220 columns on standard 15-inch-wide paper.

The printer employs a dot-matrix character formation technique, pioneered with the IDS Model 460 Paper Tiger, in which the placement of "dots" overlap both horizontally and vertically to achieve correspondence quality printing.

A nine-wire "ballistic" wire head uses two staggered rows of print "needles" to create vertically overlapping dots in a single pass of the print head — a function not possible using standard matrix printers. The 560 print head is driven bidirectionally under microprocessor control by a stepper motor drive mechanism with true "logic seeking" look-ahead capability and high-speed slew from the end of one line to the beginning of the next.

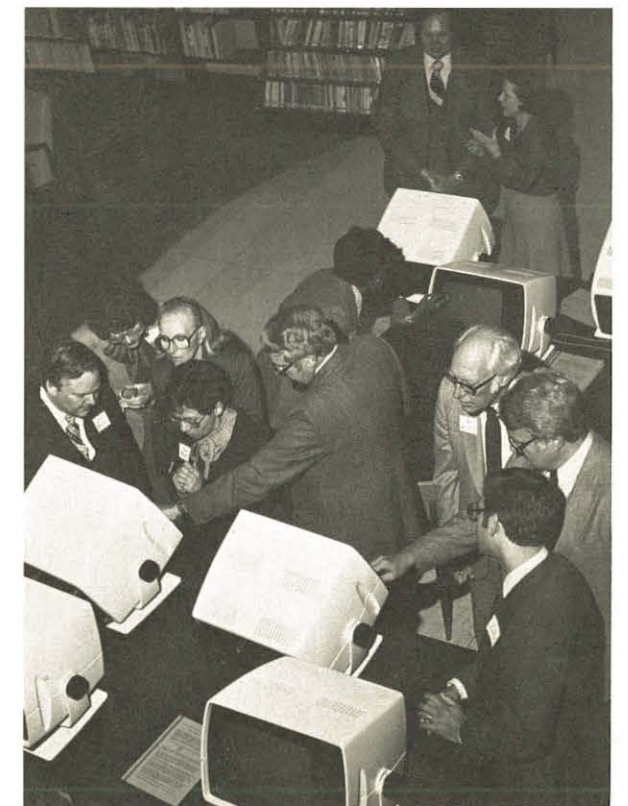
Touch-Sensitive Terminals Ordered From Interaction Systems, Inc. For Library Catalog Application

Interaction Systems, Inc. (ISI), Newtonville, MA, has announced the receipt of an order for 1,000 of their Model TT-100™ touch-sensitive display terminals from C L Systems, Inc. (CLSI). CLSI is the leading supplier of automated systems for libraries. The touch-sensitive terminals will be marketed in CLSI's automated library catalog applications.

The agreement between ISI and CLSI, provides for delivery of the terminals over the next 26 months.

In the automated library catalog application, the touch-sensitive display terminals are situated in the public areas of the library and are used by patrons to obtain access to descriptive information about the library's collection as well as the current location and availability of all books. The automated library catalog marketed by CLSI under the trade name of LIBS 100 Public Access Catalog replaces the use of conventional card, book, or microfilm catalogs.

The ISI Model TT-100™ touch-sensitive display terminal is a CRT display terminal equipped with touch-sensitive capability. This capability allows data to be input or accessed in a data processing system by simply touching, with the fingertip, the area where the appropriate information is displayed on the CRT screen. The touch-sensitive capability allows people who are not familiar with the use of computerized equipment to conduct an interactive dialog at the terminal and obtain information from the online files with no prior training. ISI is a leading manufacturer of public access display terminals such as the Model TT-100™.



A library catalog is accessed by members of the public at large by using the touch-sensitive display terminals.