ENGINEERING NEWS

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JOYCE LEKAS EDITOR 6601 50/462 RHYS SCHROCK ASSOCIATE EDITOR 6071

new CRT faceplate test system

Storage CRT Engineering has built a vacuum system to inexpensively test CRT faceplates in the research stage. This includes evaluating different phosphor types and collector structures, and determining the effect of different processing steps on phosphor performance.

Phosphor requirements for a number of Tek's CRT-based products (simple bistable storage tubes, graphics terminals, etc.) are very different from those of other industries, like television. We rely heavily on in-house research and development efforts to insure both a reliable supply of phosphors, and workable phosphor deposition techniques.

Previously, about the only way to determine if a target-collector-phosphor configuration would work or to check a particular problem such as phosphor adhesion, was to build the target faceplate into a finished CRT and then turn it on. This practice required that a number of expensive CRTs be built to complete a set of phosphor experiments. Each CRT became an expensive 'test tube,' useful only for evaluation of a few milligrams of material on the surface of a piece of glass. With the thought that a substantial amount of both time and money could be saved if the same CRT funnel could be used to evaluate a number of targets, a demountable vacuum system was built.

The system consists of two separate vacuum chambers, connected by a sliding gate valve. The larger rear chamber contains a standard production 434 CRT funnel, complete except for a faceplate. The funnel is mounted in a rolling carriage. The front chamber contains a target faceplate holder.

For system operation, the gate valve is lowered into place, atmospherically separating the two chambers. The rear chamber, containing the CRT funnel, is pumped to a vacuum level equal to that in a finished CRT. The front chamber is opened to room atmosphere, allowing the operator to insert a prepared faceplate.

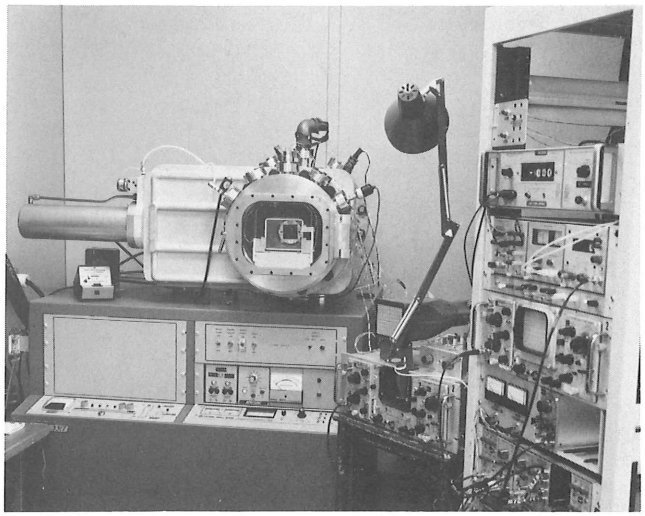


Figure 1. The Demountable Vacuum system with the gate valve open. CRT funnel can be seen in the chamber.

The front chamber is then pumped to a low level, the gate valve is raised, and the 434 CRT funnel rolls into place directly behind the target faceplate. Mechanical features and vacuum valves are arranged so the funnel is never exposed to any appreciable pressure difference while targets are being changed. The entire operation requires only eight to ten minutes to completely insert a new faceplate.

Vacuum feedthroughs bring all the necessary supply voltages to the CRT funnel and faceplate. The equipment has proven to be versatile. Any size faceplate up to a width of about 6 in. can be examined with the present T434 funnel. In one series of experiments, for example, a T214 target was the test vehicle. This was the first time a T434 funnel had been mated with a T214 faceplate.

The demountable system is not limited to a single type of target evaluation. To examine storage mesh assemblies, the T434 carriage and faceplate holder is removed and a T7630 assembly installed in a matter of minutes.

Although a demountable system is expensive, the substantial reduction in the number of finished CRTs necessary to complete an experiment more than justifies the expense. Assuming a finished CRT costs approximately $100, the break-even point comes when about 350 experimental target evaluations have been performed. Since February of this year, when it became fully operational, the demountable system has helped conduct almost 500 such tests.

There are other advantages to a demountable system. Time is saved between successive generations of experiments. An experimental target can be prepared and data taken the same day, without the previous time delay necessary for processing the test target in a finished CRT. In addition, a target never gets lost during a series of tests due to CRT failure like a gas leak or a heater-to-cathode short.

We now have the ability to conduct many different experiments on a single target. Screening a series of targets so the most promising ones can be made into real CRTs is possible. Finally, reclaiming special, nonproduction (nonstandard) faceplates at the conclusion of an experiment is also possible.

The demountable system is proving to be a valuable addition to the family of instruments necessary for phosphor research and process development. This is especially true in terms of the time and money saved, and the expanded number of experiments now possible.

-Bob Vreeland

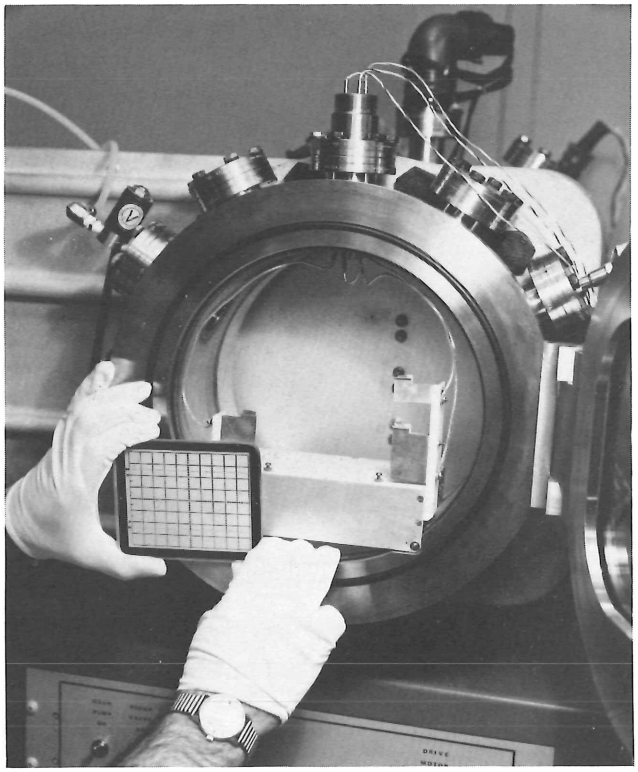


Figure 2. With the rear chamber isolated by the gate valve, the front chamber is opened to room atmosphere for insertion of test faceplate.

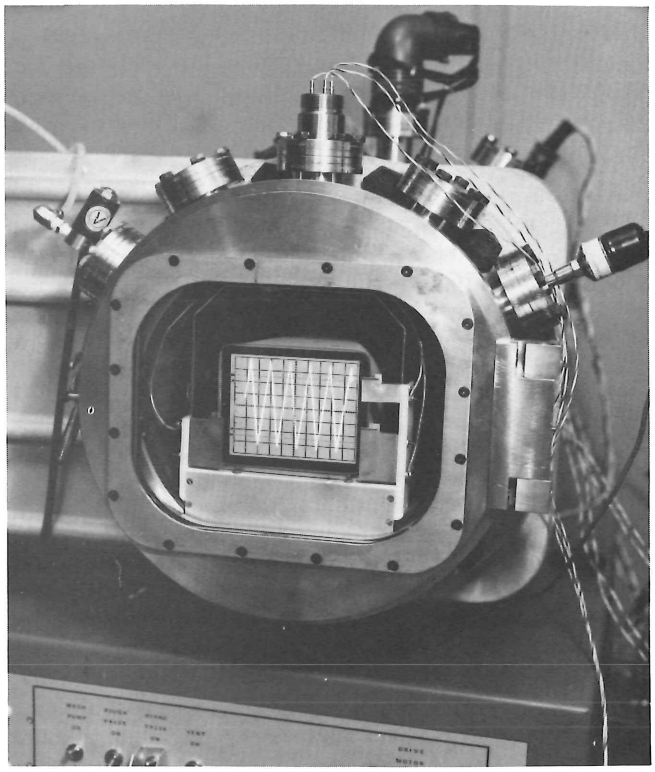


Figure 3. When the gate valve is opened, the vacuum is equalized in both chambers. The CRT funnel has been rolled forward and a prepared faceplate is being tested.

In Print

Ken Lindsay, Systems Division Marketing, wrote an article which appeared in the August 7, 1975 issue of ELECTRONICS magazine entitled, *"Curve tracer can check optoisolator performance."* The material covers using a curve tracer (a Tek 577 in this case) to check an optoisolator's ratios of transistor collector current and base current to forward current, and also to check for isolation voltage ratings. Step by step instruction is provided, in addition to photographs of what to look for on the curve tracer's CRT during each test.

WATCH THIS SPACE for

UL INFORMATION

-COMING SOON-

TEK NAME TAGS
and the security system at Wilsonville

As name tags become a more familiar sight around Tek, we thought it might be enlightening to get some views and personal philosophies concerning their use and usefulness. The general consensus was that they were primarily a device for the association of names and faces, or as Bill Walker puts it, "they help promote the informal communication that we enjoy here."

The name tags have been in use for a few months by the Communications Division, the Laboratory Instrument Group, IDD and parts of Engineering. They are white with a blue backing, so that the engraved portions show blue. The Tek "bug" is hot stamped in the upper left hand corner. The person's name and department are engraved, and in the lower right corner is a dot. Some departments color code the department name and the dot. IDD codes the dot only.

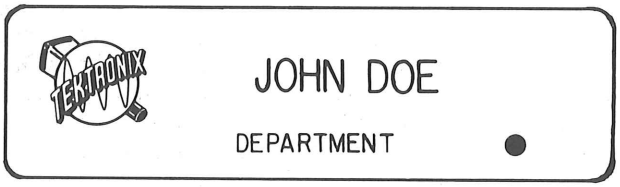


Figure 1. The name tag is white with blue logo and lettering. The department name or dot can be color coded.

The name tag is fastened with either a pin or a double clip. Fastening devices are still being investigated. Another alternative may be offered at a later date.

Name tag use will be left to the discretion of the Division Manager, but the tag style should be standard throughout the company.

Several key management personnel were approached (Tom Long, Bob LeBrun, Larry Mayhew, Bill Peek, and Bill Walker) and most seemed in agreement on a few points. It should become easier for new employees to get to know the people they work with, and for exsisting employees as well. Knowing what department a person comes from is helpful in addressing problems and questions to the right person. The present name tags are a little awkward to wear, but that is a minor problem. The name tags can serve as a form of informal security when an unfamiliar face is seen in an area. If a stricter security system is ever implemented at Tektronix, it would be independent of the name tags and based on the need for such a system, the cost involved, and the impact on employee rights.

Larry Mayhew of IDD has encountered a unique situation with the Wilsonville Plant, and had additional comments to offer. He says that with the design of the Wilsonville Plant, name tags were decided on in association with the card key security system there. The intent of a security system at Tek is to do as much as possible to protect both employee and company property with a minimum of infringement on employee freedom and liberty.

Larry feels that the purpose of name tags is threefold: first and most important is that they help in remembering names. They also identify individuals with their working places. And they will help to control unauthorized visitors. All visitors to the Wilsonville Plant will be required to wear visitor tags. A similar system has been used in building 81 for several years. Frequently visitors from competing companies visit our buildings to service their machines which are in use at Tek. A visitor's tag would help keep these people in the areas where they are authorized.

At Wilsonville there will also be an ID card, which will double as a magnetic card key. These are preferable to a standard key. A key can be used by anybody; the cards will have the person's name and picture on it. When the card is inserted in one of the card readers, a computer will scan a list to see if the person is authorized to enter the building, and will record who enters.

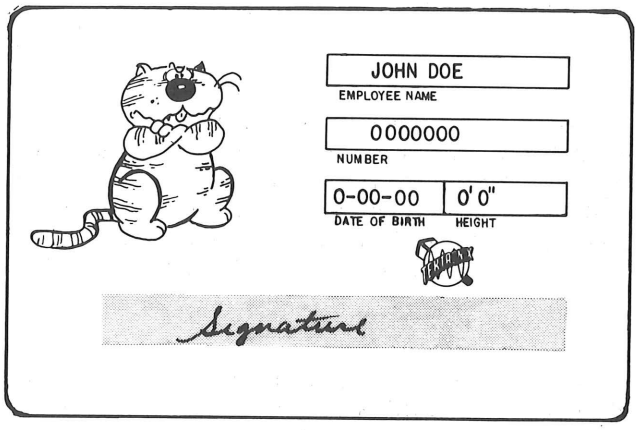
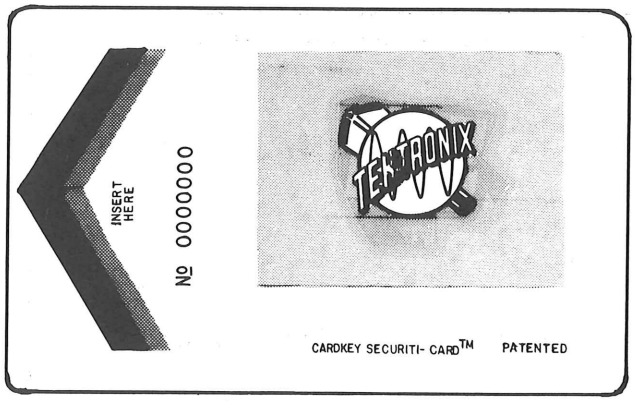


Figure 2. The ID card has the employee name, picture, and important information. It also serves as a cardkey.



A key is easily duplicated. In case of loss, a standard key system requires a changing of all the locks. The card key system requires only a message to the computer, which will make the card which has been reported as lost, useless.

A close proximity device will be used in Data Systems. These cards can be held within a specified distance from the card reader. A valid card will open the door. This is considered beneficial to persons with armloads of material.

The Technical Center (Bldg. 50) and the General Purpose Building (Bldg. 58) are also being considered for an access system. A thorough study is in progress.

Larry stresses the fact that there is no change in the basic trust of Tektronix employees. Any company with as many people as we have in one area, has problems in identifying the ones who are employees. Concerns of this nature led Tek to consider the alternatives of security and employee identification. Otherwise, the 99% of the employees worthy of company trust are penalized and helpless when there is theft. He feels that this ID system is a simple method to keep check on most theft, with a minimum of infringement on the personal rights of the individual.

The Wilsonville Plant will be as open as the buildings in the Beaverton Plant during normal working hours. There will be no zones or locked doors within the building. Color codes on the name tags will identify where a person works, but will not necessarily be used for keeping a person out of an area.

After hours and on weekends there will be two entrances to the building which will require the use of the card keys. That will be the only time the cards will be required to get into the building. The computer will record the time when a person enters the building. There is no card reader on the way out, so it is not possible to use the system as a "time card" type record.

The service module which contains the cafeteria and restrooms can be locked as a separate area from the rest of the plant. Then it can be used as a community meeting place without compromising plant security.

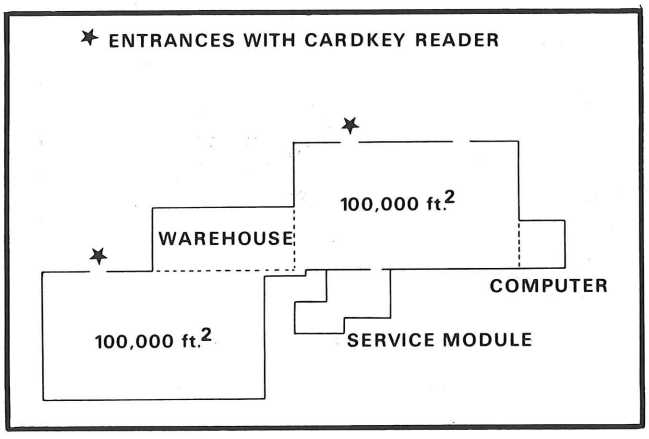


Figure 3. The Wilsonville Plant has two entrances with cardkey readers.

new crew's views perused

In order to evaluate the Tek orientation programs for new engineers, a questionnaire was distributed on June 20 to engineers who had completed approximately one year of employment with Tek. Returns were 43% of those sent out.

At least 75% of the new engineers are designing new products. Most of the rest are in support activities. Almost 20% are working primarily in software related activity.

About 70% of the engineers expressed satisfaction with how well their special interests and abilities matched their work assignment. Poor matches occurred for only 7% of the respondents, including one who expressed a desire to work with music synthesizers, and in bicycle and sailboat design.

The method most favored for learning new skills and concepts was in the normal course of work assignments with formal coursework, seminars and conferences following in that order. Several respondents found that informal group discussions were most helpful.

Most felt they had been helped in getting established and occasionally praised the friendly cooperative atmosphere. A few did not agree. About half commended their managers as "helpful" or "very helpful." Sixteen percent were very negative in appraising their manager's role. Although most were helped by colleagues, secretaries were the most helpful to 7%.

The general Tek orientation program was rated "fair" by half the respondents with an equal number rating it "good" and "poor." The new engineers orientation program was rated as "good" by 55% and "fair" by 43% with one "poor" vote. There was one comment that engineering orientation might have been more interesting if presented by engineers, instead of managers.

Responding to the question, "What would you have done differently regarding your Tek experience?" most replied "nothing" although 7% would have worked someplace else inside or outside Tek. And a few expressed regrets at not having bought Tek stock when it was $18.

As to what Tek might have done differently, several had ideas to pass along. The gripes centered around a lack of attention from the manager. Lack of salary administration, job descriptions and performance reviews were cited. Of the total, 32% expressed dissatisfaction with their situation. Of this group, 10% seem very discontented.

The results of this survey are useful not only as an assessment of the new engineer orientation programs, but also as information for the managers of these engineers. This new information could help managers relate better to new engineers' problems, and make the adjustment process generally smoother and easier.

the paging game*

Some Basic Rules

1. Each player gets several million *things.*

2. Things are kept in *crates* that hold 4096 things each. Things in the same crates are called *crate-mates.*

3. Crates are either stored in the *workshop* or in a *warehouse.* The workshop is almost always too small to hold all the crates.

4. There is only one workshop, but there are several warehouses. Everybody shares them.

5. Each thing has its own *thing number.*

6. What you do with a thing is *zark* it. Everybody takes turns zarking.

7. You can only zark your own things, not anybody else's.

8. Things can only be zarked when they are in the workshop.

9. Only the *Thing King* knows whether a thing is in the workshop or in a warehouse.

10. The longer a thing goes without being zarked, the *grubbier* it is said to be.

11. The way you get things is to ask the Thing King. He only gives out things in multiples of eight (this keeps the Royal Overhead down).

12. The way you zark a thing is to give its thing number. If you give the number of a thing that happens to be in the workshop, it gets zarked right away. If it's in a warehouse, the Thing King packs the crate containing your thing back to the workshop. If there isn't room in the workshop, he first finds the grubbiest crate in the workshop (whether it be yours or somebody else's), and packs it off with all its crate-mates to a warehouse. In its place, he puts the crate containing your thing. Your thing then gets zarked, and you never know that it wasn't in the workshop to begin with.

13. Each player's stock of things have the same numbers as everyone else's. The Thing King always knows who owns what thing and whose turn it is, so you can't accidentally zark somebody else's thing (even if it has the same thing number as one of yours).

Some Important Notes

1. Traditionally, the Thing King sits at a large segmented table, and is attended to by pages (the so-called 'table pages'). It is their job to help the Thing King remember where all the things are, and who they belong to.

2. One consequence of Rule 13 is that everybody's thing numbers will be similar from game to game, regardless of the number of players.

3. The Thing King has a few things of his own. They move back and forth between workshop and warehouse just like anybody else's, but some are just too heavy to move out of the workshop.

4. With the given set of Rules, oft-zarked things tend to get kept mostly in the workshop, while seldom-zarked things stay mostly in a warehouse. (This is efficient stock control.)

5. Sometimes even the warehouses get full. The Thing King then has to start piling things on the dump out back. This makes the game slower because it takes a long time to get things off the dump when they are needed in the workshop. A forth-coming Rules Change will allow the Thing King to select the grubbiest things in the warehouse and send them to the dump in his spare time, thus keeping the warehouses from getting too full. This means that the most infrequently-zarked things will end up in the dump, so the Thing King won't have to get things from the dump so often. This should speed up the game when there are a lot of players and the warehouses are getting full.

LONG LIVE THE THING KING

*Brought to Engineering News by Roy Carlson with the compliments of Jeff Berryman, University of British Columbia.

Scientific Computer Center

HELP,XXXX

The following is a list of utility programs developed by the Scientific Computer Center group. For in-depth information on any of the following, type HELP,XXXXX (where XXXXX is the name of the particular program).

If you type HELP,INDEX, you'll receive a list of everything that has an explanation listed under HELP.

Utility Programs

CHARGES - This program will tell you how much money you've spent during the current period.

NEWTAPE - Will assign you a new, blank library tape. For complete information, type HELP,TAPELIB.

TF - A tape file system which may be used to save and restore files using either the 7 or 9 track drive.

BACKUP - Saves all indirect access files in your catalog on either the 7 or 9 track drive in a TF format.

SCRIBE - An interactive character-based text editor with much more power than EDIT.

BARB - A batch program for producing formatted write-ups. Type -WRITEUP,BARB for a complete BARB document.

XFER - A fancy copy program with multi-file and merging capability. Type -WRITEUP,XFER for a complete XFER document.

USERS - This often explains why the system is running slow.

EX - An easy way to execute FORTRAN programs. Writeups are available in the computer room.

LUCY - A medium to register praise or complaints.

PRINT - A procedure for printing a file which has no carriage control characters. Type HELP,PRINT.

BUTTER - A set of FORTRAN subroutines to read or write some (but not all) non-standard tapes. Type HELP,BUTTER.

HEADING - Puts a page of block lettering on the front of a file. Type HELP,HEADING.

SAMTOP - A procedure for sending a message to the operator and receiving a response.

MACHINE - The MACHINE command provides a graphic way of looking at how the Cyber 70 computer system's resources are being used. A Tek 4010 family terminal is required.

TIDY - A program to clean up code and re-sequence statement numbers in a FORTRAN program.

NEWS - Should be typed first thing every day. It lists items important to users.

TAPES - This program will list all magnetic tapes currently assigned to your user number. For information, type HELP,TAPELIB.

USER AREAS UPDATE

In case you've lost track of user areas provided by the Scientific Computer Center throughout the company, here's an updated list of their locations and the equipment available at each one....

Building 50 (2nd floor, 50-232) One 4010-1, one 4014-1, and one 4015-1, all tied to a hard copy unit.

Building 50 (3rd floor, 50-391) One 4002, one 4012 & hardcopy & paper tape punch, and one 4002A & hard copy.

Building 50 (4th floor, 50-454) Three 4010-1s & hard copy, and one 4911 paper tape punch.

Building 58 (1st floor, 58-172) Two 4010-1s & hard copy, one 4002A & hard copy, and one 4911 paper tape punch.

Building 58 (2nd floor, 58-532) Two 4010-1s & hard copy, and one 4002A & hard copy.

We will notify our readers whenever these facilities are expanded or others are added.

TEN-WEEK CURE

At a loss when someone mentions the Cyber-70 Computer System at a party? Hardware, software, tupperware? When rated against competitive products John Telford with TEP 5.302 was found to significantly increase Cyber-awareness in 4 out of 5 cases. Taken once every Friday from 4 to 6, 5.302 is a non-prescription item available upon request. Learn more about the hardware and something about the software and assembly language. All classes are listed in the Tek E&T autumn schedule. For more information, contact John Telford, ext. 7668, or Tektronix Education Program, ext. 5434.

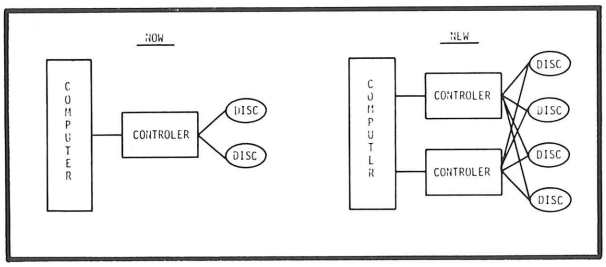
EXTRA DISCS FOR THE CYBER-73

Two new storage discs and a controller were recently added to the Cyber-73 Computer, doubling its storage capacity. There were formerly two discs and a controller working in the computer system. Each disc holds 110 million 6-bit characters. One disc contained permanent files and was about 70% full. The other contained the operating system and "scratch" space for operations in progress.

The two controllers working together will provide two routes for information and each will address all four discs.

Two discs will contain a copy of the operating systems and "scratch" space, and permanent files will be divided equally between the remaining two discs. The addition of an identical copy of the systems information will result in a smoother, quicker operation.

The two new discs are temporary, and will be replaced with double-capacity discs in about a year. This will triple the Cyber-73's previous disc storage power.



Additional discs and controller provide many alternate routes for information.

POLY-DIMENSIONAL PROGRAM PREPARED to PROMOTE PICTURE and PATTERN PLOTTING for PROFESSIONAL PEOPLE

A two-dimensional plotting program is now available on the CDC Systems library. To find out all about it, type:

HELP,PLOT2D

CALCOMP PLOTTER FACILITY

A Calcomp plotter facility will soon exist for users who wish to make larger and/or more precise plots.

The model 563 Calcomp plotter was previously used with the IBM 1130 before its departure. The drum's usable width is 29 inches, and software will limit the chart length to about 27 feet. The unit is an incremental plotter, capable of two inches per second in 0.01 inch steps.

A microprocessor interfaces the Calcomp with KRONOS, allowing line interpolation to be done without the use of the central processor. This simplifies communication and reduces the computing time necessary to generate a plot.

For easy production of Calcomp plots, the software will appear similar to Plot 10. With very minimal modifications, a problem which would plot on a 4010 will generate a similar Calcomp plot. Some additional routines will be added, allowing changes in pen colors, special paper, etc.

As planned, this facility will be available by November 1. You can get more information by typing HELP,CALCOMP. Information will be updated as things develop. Direct all questions and/or comments to ext. 5865, Bill Lowery.

HIGHER LEVEL MICROPROCESSOR LANGUAGE AT TEK?

In the microprocessor class given this summer by Steve Pataki, it was obvious that many competent engineers are bewildered by the large number of languages necessary to program state-of-the-art microprocessors. By the beginning of the second half of the class, 50% of them had given up and left.

The problem of a different language for each new machine is not new. Computer scientists agree that the best solution is a standardized, high-level language. Although such a language will undoubtedly evolve someday, Tektronix cannot afford to wait. Some of the problems involved are:

1. Each microprocessor has its own language and support software, requiring relearning for each new project.

2. Assembly language coding is tedious and error-prone. The use of assembly language to produce more efficient programs is a waste of time. Most significant increases in performance are achieved through the use of better algorithms, and not necessarily through fancy assembly language coding.

3. Most assembly language programs defy documentation, making the loss of a key programmer a catastrophe and custom mods almost impossible. Field support people experience difficulty in keeping up with the flood of new assembly languages. This reduces their effectiveness in customer service, and limits the feedback to engineering. Customers may lose confidence in Tektronix if each new instrument uses unproven software.

Proposed Solutions

A high-level language (with a library of proven routines) will solve the problems mentioned above. Engineers will be able to take advantage of previously proven routines in building their systems, saving engineering time. They will be able to incorporate the latest microprocessors in their projects, keeping us competitive. Finally, the customer will see familiar routines in our instruments, increasing his/her understanding and confidence.

Our high-level language will be a block structured language, similar to PL/M, with added features from other languages such as Pascal. This language will compile into a pseudo-assembler language, which will then be translated into the actual assembly language of the machine. This will allow access to two levels of assembly code, solving those problems that don't lend themselves to a higher level language.

We feel that a common language for microprocessors will not only satisfy today's needs, but will also easily expand to meet the needs of tomorrow's microprocessors. Send reactions and comments to:

Lynn Carter
Microprocessor Committee
Scientific Computer Center
50-454 Extension 5714

PATENTS PAY OFF

A good patent portfolio is important to any company that wants to stay in business today. Efforts to increase Tek's patent portfolio are paying off in a recognizably strengthened patent position. For example, our patents are instrumental in negotiating cross-licensing arrangements with other companies to our benefit. In some cases they also give us access to technology being developed by other companies that would otherwise not be available.

Evaluation of recent Iwatsu instruction manuals shows that this large Japanese company is carefully avoiding infringement of Tektronix patents in the design of its new oscilloscopes. This is a healthy sign because the departure from utilizing our technology indicates that our major competitor in Japan is spending money on its own research and development. A provision in the Japanese patent law gives us a 60-day period in which we can prevent new Japanese patents from issuing if we have knowledge of prior art. We have successfully opposed several of Iwatsu's new patents which were based on Tektronix instruments. Also, we now send schematics to the patent staff of Sony/Tektronix at design completion of new products. Kit Okada and Phil Koyama evaluate these schematics and make their recommendations. In many cases, circuits and mechanical arrangements which may be considered marginally patentable in the U.S. are pursued in Japan because of the highly industrialized and patent conscious situation there.

At this point, it might be good to mention the importance of maintaining an engineering notebook. In the U.S. issuance of patents is based on "first to invent" rather than "first to file." Proof of the invention may be provided by the notebook, which should contain a description of the method or apparatus, along with dates and signatures of witnesses that understand the invention. Engineering notebooks, which are bound and have numbered pages, are available from MaryAnn Reeves, ext. 7787.

Tom Noe

COMPETITION FOR THE 100 MHz LINE

The last few issues of ELECTRONICS magazine (August 21 and September 4) brought news of new competition for the 100 MHz oscilloscope line in the form of recently introduced instruments.

The first news was that Dumont Oscilloscope Laboratories has re-entered the commercial oscilloscope market with a crash program that includes a 100 MHz scope at a lower price than our own 465. Dumont introduced the first oscilloscope in the 1930's. Three years ago they stopped pushing commercial sales to concentrate on the military market.

Other news came in the September issue with the announcement of Hewlett-Packard's 1740A, also lower priced than the 465.

Both companies are offering special features in an attempt to capture a part of the Tektronix dominated market.

BREAKING INTO PRINT

ENGINEERING NEWS appreciates all the help we've been getting from you in the form of information for stories. We hope we can continue working together to increase the communication in the engineering groups.

But we still haven't heard much from the Mechanical Engineers. An occasional $\Delta = PL^3/3EI$ or a Modulus of Elasticity pun, but that won't pay the bills. We know you're out there.

When you want to see an article about your engineering feats, give us a call. We'll help you arrange your material into a final form. We have a fine graphic design department for charts, graphs, diagrams, and photographs.

ENGINEERING NEWS, ext. 6701 or 6601.

TEK LABS INDEX UPDATE

Are you ready for another chapter in our continuing effort to update the Tek Labs Technical Report Indices? Well, here it is.... Incidentally, if anyone does not have a copy of the complete index and wishes one, call Joan Stenerson at ext. 7555.

Microelectronic Process Development - Lynne Brady, ext. 6305

91.040 Development of a non-alkali metal.

91.041 A preliminary evaluation of the Cobilt AF-200 automatic oven.

91.042 An evaluation of OFPR-2 photoresist on titanium-aluminum substrates, and a comparison of its performance against that of AZ1350J photoresist. A joint ICE-ICM project.

91.043 H_{fe} sensitivity to processing parameters.

91.044 Matrix of boron drive temperature vs. oxide thickness.

91.045 MSAM- a new small angle measurement technique.

91.046 Ellipsometric parameters: Experimental determination of wave plate constants and azimuthal angular resolution limits.

Hybrid Circuits Engineering - Karen Lucas, ext. 5868

93.004 Surface effects on MOS and PN junction devices, and deep inversion curves for MOS capacitors.

Materials Development - Nancy Martin, ext. 5387

97.017 Study of shallow junction depth measurement by ball bevel and strain.

Storage CRT Engineering - Dorothy Whitesides, etc. 7504

033 Auger analysis of phosphor surfaces.

034 Electrical readout from a mesh storage tube.

035 Optimization of a two-element collimation lens as used in the T7420 CRT.

036 Fast 434 targeting using M_gO coated P-I.

ST-145 Performance of T611 tubes, yttrium oxysulfide phosphor targets, pumped in manufacturing.

ST-146 Effects of heat treatment on performance of USR Y_2O_2S phosphors, T611 and T434 tubes.

ST-147 4014 Improved performance writing gun proposal.

ST-148 P-1 demountable study.

ST-149 The effect of ASA-3 prototype chemicals on the Freon settling of YOS.

ST-150 Owens-Illinois XS-1080 solder glass.

ST-151 Freon settling process (1) phosphor quantity and CRT (611) performance.

ST-152 ThO_2 sprayed Y_2O_2S targets.

ST-153 Background partial pressures in the demountable.

ST-154 4014 Performance vs. collimation potential.

ST-155 Evaluation of rectangular cathode flood guns and their performance in 11 in. CRTs.

ST-156 New field forming electrode structure for the two-watt pierce flood gun.

ST-157 Preparation of 214 screens by spraying.

ST-158 Freon settling YOS:Tb onto different collector structures in T4340 targets. Comparison of demountable testing of rare earth T4340 targets with unaged and aged CRT data. Studies of effect of fritting on target performance.

ST-159 4014 Scabby aluminum wall coating vs. hard copy band noise.

ST-160 Color write-through penetration phosphor.

ST-161 564 Flood gun anode position tolerances.

ST-162 Reduction of agglomerates in rare earth phosphors with an ultrasonic probe. Effect of particle size distribution and tube performance.

ST-163 Life tests of USR, Y_2O_2S, Lot '3', T611, and T434 tubes.

ST-164 Effect of smaller grid aperture diameter on T4640/T7630 CRT performance.

ST-165 Effect of addition of cobalt dot structure to the sprayed 5643-200 target.

ST-166 Freon settling process II. Investigations concerning ASA-3, a conductivity additive.

ST-167 Zicon sprayed rare earth targets.

ST-168 Freon settling process III. Contrast ratio improvement using dark collectors. Lot '3' Y_2O_2S on 611s.

ST-169 T4014 Writing gun current distribution and life effects.

ST-170 CRT focus voltages for 4006, 4010, 4012, and 4014/4015.

ST-171 Yttrium oxide (Y_2O_3) addmixed with P-1.

Call for papers

The 1976 **IEEE International Symposium on Circuits and Systems** will be held at the Technical University Munich, Munich, West Germany, April 27-29, 1976.

SPONSOR: IEEE's Circuits and Systems Society.

TOPICS: Original 20-minute papers are invited. Topics of interest include, but are not limited to:

Theory and design of circuits and systems
Links between theory and practice
Novel approaches to analysis and synthesis
Circuits involving newly emerging technologies
Computer oriented methods for design, layout, and manufacturing.

ABSTRACT: Four copies of each paper should be submitted by October 1, 1975.

OTHER: Send materials to:

Alfred Fettweis
Lehrstuhl fur Nachrichtentechnik
University of Bochum
Postfach 2148
D-4630 Bochum, F.R. Germany

The 1976 **International Conference on Frontiers in Education** will be held at the Ramada Inn in Tucson, Arizona on October 25-27, 1976.

SPONSOR: IEEE's Educational Group, the Educational Research and Methods Division of the ASEE, with the participation of the College of Engineering of the University of Arizona.

TOPICS: Original papers covering any topic related to the general theme, "Frontiers in Education" are invited.

ABSTRACT: Authors should submit a synopsis (200-500 words) by January 15, 1976. Notices of acceptance will be returned by March 15, 1976. Final drafts of accepted papers are due by June 15, 1976.

OTHER: Send synopsis to:

Dr. E.R. Owens, Program Coordinator, FIE '76
Electrical and Electronic Engineering
California Polytechnic State University
San Luis Obispo, California 93401

The 1976 **IEEE Region Six Annual Conference** "Energy for the Future" will be held at the Braniff Place Hotel, Tucson, Arizona, on April 7-9, 1976.

TOPICS: Original papers are invited. Areas of interest include:

Future Energy Sources
Future Energy Implementation Topics
Electronic Test Equipment
Energy Perspectives
Power Technology
Applied Electronics
Energy Storage
Military Electronics
Professional and Career Issues

ABSTRACT: A 30-50 word abstract is due by October 30. Name, address, telephone number, and affiliation of author should be included. Authors of abstracts that are selected will be invited to forward a 300-500 word summary.

OTHER: Selection of papers and author notification will be completed by January 15, 1976. A Conference Record, including all papers presented, will be available at the meeting. Send all material to:

Technical Papers Chairman
1976 IEEE Region Six Annual Conference
P.O. Box 27863
Tucson, Arizona 85726

The 1976 **IEEE Region 3 Conference and Exhibit** will be held at Clemson House, Clemson University, Clemson, South Carolina on April 5-7, 1976.

TOPICS: Original papers are invited describing new developments in the theory, concepts, methodology, and applications of Electrical and Electronic Engineering. Areas of interest include, but are not limited to:

Computers (Hardware & Software)
Power Systems
Microcomputers
Lasers and Optical Systems
Management
Instrumentation
Semiconductor Devices
Electronics
Bioengineering

ABSTRACT: Submit 4 copies each of a 50 word abstract and a 200-400 word summary by October 1, 1975. Acceptance notification will be by November 1, 1975. Final manuscripts will be received by January 5, 1976. Each author's presentation will be limited to 20 minutes.

OTHER: Submit papers to:

Dr. J.W. Lathrop
Program Chairman
E & CE Dept.
Clemson University
Clemson, SC 29631

The 1976 **IEEE Control of Power Systems Conference and Exposition** (Utilization and Supply) will be held in the Ramada Central Convention Inn, Oklahoma City, Oklahoma, on March 10-12, 1976.

SPONSOR: Oklahoma City Section and Region 5, IEEE.

TOPICS: Technical papers will be given in three parallel sessions. Areas of interest include but are not limited to:

Control of utilization systems
Control of transmission and distribution systems
Control of production.

ABSTRACT: Titles and abstract (200-500 words) are due October 1, 1975; instructions and authors guides will b mailed to authors, October 15, 1975; completed copies o papers will be due January 1, 1976.

OTHER: Send all material to:

Dr. M.E. Council
Technical Papers Chairman
University of Oklahoma
Electrical Engineering Dept.
202 W. Boyd-Room 449
Norman, Oklahoma 73069

The 1976 **Industrial Electronics and Control Instrumentation Conference** will be held March 8-10, 1976 at the Sheraton Hotel, Philadelphia, Pennsylvania.

SPONSOR: IEEE's Industrial Electronics and Control Instrumentation Group.

TOPICS: Original papers on the following subjects are invited:

Industrial uses of microprocessors
Microprocessor hardware architecture
Microprocessor software and standardization
Computerized data acquisition systems
MSI and LSI in process control
Real-time process measurement techniques
Power electronic controls
Transducers and test instrumentation
Infrared techniques
SWE (acoustic emission) in process control
Reliability.

ABSTRACT: Ten copies of an extended abstract (400 words) are due by September 1, 1975. Notices of acceptance will be returned by October 15, 1975. Final manuscripts are due by December 15, 1975.

OTHER: Send materials to:

Sotirios J. Vahaviolos
Program Chairman, IECI '76
Engineering Research Center
Western Electric Company
P.O. Box 900
Princeton, New Jersey 08540

IEEE's Transactions on Electron Devices will have a special August, 1976 issue for the publication of original works on High-Power Semiconductor Devices.

SPONSOR: IEEE Electron Devices Group

TOPICS: Areas of interest include:

Materials
Processes
Devices
Packaging
Characterization of devices and materials.

ABSTRACT: The deadline for papers is November 1, 1975.

OTHER: All prospective authors should indicate their intention to submit a paper by submission of an informal letter to that effect as early as possible. Send manuscripts to either:

Mr. Richard A. Kokosa
General Electric Company
Electronics Park
Box 41, Building 7
Syracuse, New York 13201

or:

Dr. Daniel R. Muss
Westinghouse Research Labs
Building 801, Third Floor
1310 Beulah Road
Pittsburgh, Pennsylvania 15235

Maureen Key 46-571