Philosophical discussion seemed to be limited; participants were primarily interested in learning details and questioning the designers with regard to design philosophy and decisions.

An evening session was held at Washington University's Computer Systems Laboratory. Several systems constructed using macromodules and register transfer modules were demonstrated, and workshop participants were able to study electrical and mechanical construction details.

Session 3 saw the presentation of theoretical models of asynchronous systems. Participants were particularly interested in how well the models fit existing systems and elucidated possible system difficulties. Some concern was generated over the fact that more than one element sometimes resulted in Petri net constructions of identical form.

The session ended with a lively discussion of the problem of resolving conflicts resulting from the interconnection of unsynchronized systems. The problem was characterized as being of a probabilistic nature with solutions which reduce the probability of such conflicts to one small enough to accept. Several participants described specific instances of troubles they had encountered in actual practice. It appears that the difficulties stem from the arbitrarily long time which may be required for a flip-flop to reach its final state if the input signal is a runt pulse. As signal repetition rates increase, the problem occurs more often. A consensus was reached that the problem could become critical as modular systems become more common and attention should be drawn to it.

A brief discussion of the use of the currently available RT level modules in education resulted in some feeling that such modules might not be a good model in a logic design course of the way things actually are today. However, for other courses the situation would be different and these modules would be extremely useful. Also, it was pointed out that the availability of such modules would increase student motivation in design of computer systems.

In session 4, the participants attempted to define modularity in computer systems. No solid definition was possible but it was concluded that such "modules" should be general and be replicated in many places throughout the system. Also, because modules would be described by the input-output parameters, instead of internal implementation, a system might be modular at points where the number of descriptive parameters reach local minima.

A brief discussion of software modularity ensued. The participants were divided on the issue; one group held that modular software was here today while the other group maintained that this was not true, primarily due to the lack of generality and replication.

It was pointed out that there is a gap between the PMS and RT levels of modularity. There seems to be a prevalent attitude that, at least implicitly there is such an as yet undefined level. There was considerable confusion on this matter; one camp maintained that there really wasn't such a level, another thought that such a level did exist, and yet another felt that such a level might exist but the module characteristics would depend on the application.

The workshop closed with a discussion of a number of computer system parameters and what effects modularity would have on each. At first it appeared that programming would be more difficult for modular hardware but it also seemed possible that it might be made easier if the hardware could be tailored to the application. Performance can be improved by a modular system by having the system organization optimized for the application. However, the modularization might result in decreased performance of the individual modules. Improvement in reliability is often cited as a reason for modularity. However, reliability might suffer, particularly due to increased connections that must be made to connect the modules together.

It was pointed out that modular systems would enable changes in technology to be assimilated into the system without drastic revision. The modularizing process seemed to be a way to look at system modelling and theoretical studies. It was agreed that modular systems would dramatically ease the design process in terms of time and therefore contribute to a
lower total system cost. System growth could be evolutionary and controlled because of modularization. Modular computer systems can promote experimentation with a system design and free the designer from committing resources until he is satisfied with the system. This was compared to the concept of delaying variable binding for as long as possible. Finally, it was noted that modular computer systems are ecologically sound because the modules may be recycled for use in other systems.

The workshop did not produce controversy. It was agreed that modular computer systems are here today and will become even more common in the future. The participants seemed to be particularly eager to exchange experience in detail and give serious thought to implications and impact on future systems.

—Robert A. Ellis

Computer exhibitions in Stockholm, London, Frankfurt

The Office of International Trade Promotion in the Department of Commerce, recently announced three international computer exhibitions have been scheduled in Europe for U.S. producers.

“EDP IV” will be held at the U.S. Trade Center for Scandinavia, September 18-23, 1972 in Stockholm, Sweden.

There will be a U.S. exhibition at “COMPUTER ’72” for computers and accessories at the Olympia Exhibition Hall, December 4-8, 1972, London, England.

“MINICOMPUTERS AND PERIPHERALS” will be featured at the U.S. Trade Center, February 12-16, 1973 in Frankfurt, Germany.

The areas covered by these exhibitions provide excellent export markets for U.S. producers of computers and computer-related equipment, U.S. computer sales to Scandinavia in 1971 were $421 million up 65% over 1969 shipments. The United Kingdom imported $145.7 million of computers from U.S. manufacturers, an increase of 40% over 1969 purchases.

Germany has been the best market in Europe for U.S.-made computers and computer-related equipment and products. U.S. export sales to Germany in 1971 was $194.1 million, up 66% over 1969 figures. The total market in Germany is expected to reach $1.2 billion by 1974, with imports to account for $300 million.

The U.S. Department of Commerce organizes trade exhibitions abroad to assist U.S. manufacturers in increasing their export sales. Exhibiting companies are requested to make a specified nominal contribution (depending on the type of exhibition) to cover part of the expenses incurred during the course of the exhibition. The exhibitor receives in return a complete exhibition booth, all usual housekeeping services and utilities, shipping and marking instructions to expedite shipment of exhibit items through customs and to the site of the U.S. Exhibition. Each show is preceded by a full scale promotion program which includes an advertising campaign in the trade press, special direct mailings and personal calls made by the Exhibition staff on key decision makers. Each exhibitor receives publicity in show brochures and catalogs and a list of all trade visitors who register at the exhibition.

Further details on the nature and scope of these markets for U.S.-made computers and related equipment may be obtained from Mr. C. E. Walls, Project Officer, Northern Europe; Office of International Trade Promotion, BIC-946; U.S. Department of Commerce, Washington, D.C. 20230 or telephone (202) 967-4256.

AFIPS establishes industry advisory panel

An Industry Advisory Panel has been established by the American Federation of Information Processing Societies, Inc. (AFIPS). The panel, composed of senior executives drawn from leading organizations in the computer field, held its first meeting on March 16 in Chicago.

“Establishment of the AFIPS’ Industry Advisory Panel,” said AFIPS’ President Keith W. Uncapher, “marks a major step in our commitment to assure that AFIPS and the Joint Computer Conference Board remain sensitive to and responsive to industry and EDP user needs. We are determined that the JCC’s should serve the current and future needs and interests of a wide variety of management and technical people concerned with the development and use of data processing systems and services.”

“The IAP has been established with a broad charter to provide guidance and counsel to AFIPS and to the JCC Board in the management, structuring and operation of the JCC’s and related AFIPS’ activities. We have every confidence that their advice will prove a powerful tool in assuring the continued relevance of our conferences.”

Organizations represented at the March 16 meeting included: Computer Machinery Corporation, Control Data Corporation, DATAMATION Magazine, Data Products Corporation, Digitalronics Corporation, Hewlett-Packard, Honeywell Information Systems, IBM Corporation and International Communications Corporation. Additional organizations participating on the IAP include Data General Corporation, Digital Equipment Corporation and Applied Data Research.

Key individuals representing their organizations at the Chicago meeting included:

Computer chess championship in Boston

The Third Annual Computer Chess Championship will be held in Boston this year from August 13th through August 15th as part of the Association for Computing Machinery’s Annual Conference. The tournament will be a three round Swiss style tournament with one round being held each evening. Play will begin the evening before the conference. The Championship is sanctioned by the U.S. Chess Federation and will be held at the Sheraton Boston Hotel.

For the last two years Chess 3.5 has won the Championship without losing a game. It was written by a team of former Northwestern University students, David Slate, Keith Gorlen, and Larry Atkin, and is run on the Northwestern University 6400 computer. This year it is a strong favorite to repeat.

For further information on the Championship or on the conference of which it is a part, contact Richard N. Waterhouse, Public Relations Chairman - ACM 72, Computer Systems Engineering, Treble Cove Industrial Park, North Billerica, Mass 01862.
Short courses

Statistical Pattern Recognition and Data Analysis, June 5-9, 1972, Purdue University, Div. of Conferences and Continuation Services, 116 Memorial Center, Lafayette, Indiana 47907. Fee: $175.

Basic Concepts, June 5-9, 1972 and Advanced Concepts, June 12-16, 1972, UCLA Extension, P.O. Box 24902, Los Angeles, California 90024.

Current Directions in Applied Holography, June 19-21, 1972, University of California at Berkeley, 2223 Fulton St., Berkeley, California 94720. Fee: $200.


Chinese scientists invited to COMPCON 72

Seven distinguished Chinese Mainland scientists have been invited to attend the IEEE Computer Society's Annual Conference at the Jack Tar Hotel in September, according to Tracy Storer, COMPCON 72 Chairman. In addition, some 30 computer scientists who will be attending an IEEE Computer Society-Sponsored Conference in Tokyo, June 8-13, have offered to visit China as part of this exchange of technological computer information.

The last known information about digital computers manufactured in Mainland China was a brief news article in 1968 describing a large scale, fully transistorized, general purpose computer. Prior to that, the only known new digital computer was described in 1966. This was an 8,000 tube magnetic core and magnetic drum computer with a 900 line per minute printer. Also publicized in 1966 were several small scale analog computers.

Storer, a Vice President of Time/Data Corporation, expressed hope that this invitation could be the beginning of a fruitful exchange of technological information on computers needed to help solve the awe inspiring problems that face the United States and the World. "The computer," said Storer, "may be our most powerful aid in coping with the environmental forces that are threatening ours and future generations. If this is so, we need the talents of all the world's people to develop the most versatile and capable computers possible."

Cookbook

WHAT'S COOKING?

This column was started to provide a place for computer designers to present their ideas, opinions, cries for help, and almost anything else relating to computer design. It is in danger of turning into a monologue unless you keep sending in ideas, opinions, cries for help, etc. Anything short and to-the-point will be published as-is; while longer stuff will usually be abstracted along with your name and address for the benefit of those who want to inquire further. Things that look like regular articles may be referred to the regular editors for regular handling.

Send material for this column to Jim Haynes, Applied Sciences, University of California, Santa Cruz, Ca. 95060. Phone (408) 429-2916.

I goofed:
in the last issue in identifying Julius Tou as Jules (as in Verne, or Schwartz. What can you Freudians make of this one?).

Messages from the counter culture:

If you're planning to build a binary ripple counter out of J-K flipflops, you can make it ripple twice as fast without using any extra parts.

If your application requires decoding all the states of a counter you might find it advantageous to count in Gray code rather than in regular binary. For 3 bits:

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<th>Binary</th>
<th>Gray</th>
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<tr>
<td>000</td>
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It takes a little more logic besides the decoder to get this counting sequence; and with all this logic the Gray counter is slower than an ordinary binary counter would be. Here's what it gets you. Decoding is glitch-free,

since the counter doesn't ever pass through an undesired state in getting from one state to another. The counter is easily parity checked; since only one bit changes at each count the parity simply reverses at each count.

J.H.: "If this is time-sharing, give me my share right now."

D.R.: "It's not time yet."

Anyone for an easyware users' group?

Our readers should by now be well aware that one of the things we are trying to promote through this column is the sharing of designs for hardware. Another thing you should be fed up with hearing about is the hardware packaging system we designed here at U.C.S.C. to make it easy to build your own stuff. Our latest brainstorm is that if we could get a group of universities and others to agree to a standard packaging scheme there would be a lot of benefits.

1. Designs could be shared more readily, right down to the wire lists.
2. The task of developing design automation software to support the system could be divided up.
3. We could arrange to have the packaging hardware manufactured at competitive prices.
4. Manufacturers might adopt the system; it would be a good way for a struggling new company to get started; and it would make it easy for us to intermix homemade and store-bought equipment.

Our next goal is to attempt to make up a mailing list or two. We would like a list of those who have something to propose for the standard, a list of those who would like to use the standard if it should come off, a list of those who think we should drop dead, etc. So please send us your name and address and an indication of which list you would like to be on. If paper is scarce you could go back to an old issue of COMPUTER and tear out the reader service card.

An archaeological expedition working in the jungles of Brazil is reported to have found a stone fragment resembling the Rosetta Stone. It appears to contain the same text written three times: in APL, in PMS/ISP, and in Linear B. Further developments will be reported in this column as soon as we hear about them.