# news in perspective

They want to do a three dimensional problem with viscosity in about 10 to 15 minutes per solution. It would enable them to sort through a number of designs in a reasonable time, even if it took a day or two of computing. That day or two might replace what requires six months in a wind tunnel.

Cutting six month chunks of wind tunnel time is not insignificant. The average cost of that time is about $1,000 per hour, not to mention the huge amounts of ever-precious energy consumed in the process. The Boeing 747 spent more than 10,000 hours in a tunnel at a cost of more than $10 million. The B1 bomber required on the order of 25,000 hours, and the space shuttle orbiter, by the time testing is complete, will require about 45,000 hours in a tunnel. That's the equivalent of about 10 years. Even the Wright brothers used about 50 hours of time in a wind tunnel that they built.

A plot of wind tunnel time used by various aircraft shows it's going up exponentially. "One of our goals is to be able to turn the tide on this increasing number of wind tunnel hours . . . Our hope is to be able to do more of the preliminary design of vehicles that fly through the atmosphere on a computer before we actually go into a wind tunnel. We'll use the wind tunnel to verify final designs and to get additional information that we still can't compute accurately."

At Ames they are using the CDC 7600 and the Illiac, usage of the latter increasing with familiarity. "We need to start getting our codes and our tools in order so that if we get our special purpose machine in the 1981 or '82 time period we'll have our codes all checked out and ready to go on this device," says Peterson. "So we're going to be using the Illiac very heavily, starting now to pioneer these three dimensional viscous flow codes."

**—Edward K. Yasaki**

*Mainframers*

# A Very Busy Year

## Product Announcement Includes Full Scale Marketing of Multics

Nineteen Seventy Six was a busy year for Honeywell Information Systems.

It was a profitable year, too, with sharply increased earnings and minicomputer revenues.

It was a year in which HIS prepared for what one spokesman called, "one of the most important announcements in Honeywell's history"—its Distributed Systems Environment.

Honeywell also used the year to ready a wide array of new products for the Xerox user base which it acquired a little more than a year ago (see p.155).

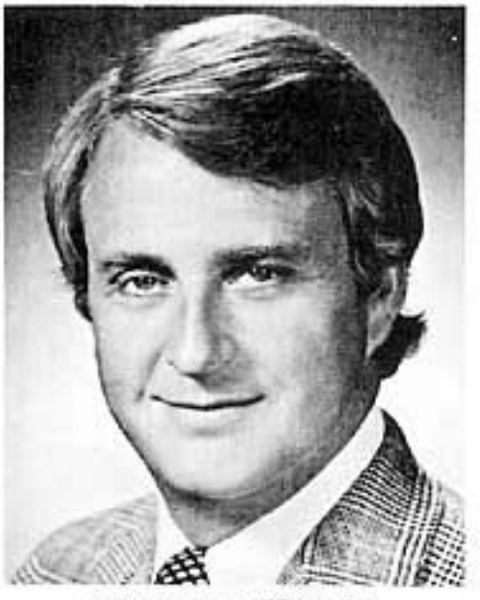
And it was a year in which Honeywell finally launched full scale marketing for something that has been around since 1965, and which has been exclusively a Honeywell product since 1973 Multics, its Multiplexed Information and Computing Service.

The DSE announcement was made with considerable fanfare. It came simultaneously in Phoenix, New York, London, and Milan, with a full complement of Honeywell top brass present at all locations.

### Phase Two

In Phoenix, William Patton, Western District vice president called DSE Phase two of an evolution of technology and marketing begun with the company's announcement of Series 60 in April 1974. He said the significance of DSE is in flexibility and control. "A user is free to establish his own configuration. He's offered a cross compiler, common data structure, common protocols, local transmission capability . . . the broadest possible range of options."

In New York, Honeywell president Edson W. Spencer said the announcement represents "a midpoint between the introduction of our Series 60 systems and their implementation in the sophisticated distributed networks of the 1980s."



WILLIAM B. PATTON, JR.
DSE offers the user the broadest possible range of options

HIS president, C. W. Spangle, said that under Honeywell's concept of distributed systems, "processors—components that are capable of altering the content of data or managing files and not simply transmission or communications devices, are placed more directly into the hands of end users."

Dick Meise, Large Systems marketing director, said in Phoenix that the primary marketing emphasis would be to existing customers with add-on systems second and replacement systems third.

Patton said he believes Honeywell will be successful in all three areas. He predicted the market for "this type of equipment will total $5 billion commencing into the '80s."

### Four Processors

The products announced for DSE include four host processors: the large scale Model 66/85 and the medium-to-large scale Models 64/60, 64/50, and 64/30; the Datanet 6678 front end network processor; the DST 6/500 intelligent terminal; RBT 6/300 remote batch terminal systems; and a low cost display terminal, the VIP 7700R.

The 66/85 was described by Norm Feldman, vice president and general manager of the Large Information Systems Div. as "the most powerful computer Honeywell has ever built." He said it is 400% faster than the 66/80, current top of the Honeywell Line.

The 66/85 makes use of Common Mode Logic (CML), instead of the more common Transistor-Transistor Logic (TTL), and a new micropackaging technique (see p. 245). CML also is used by Burroughs, but the micropackaging technique is proprietary to Honeywell.

Feldman called CML and the micropackaging technique "the technologies of tomorrow." The British news magazine *New Scientist* calls CML tantamount "to a backward step to a type of logic evolved in the design of first generation computers." The magazine says when digital circuit designers "first evolved the emitter-coupled linear circuit as a digital switch for very fast computers, it was called current steering logic or current mode logic (CML). The publication does concede the micropackaging technique is new and that coupled with CML it means faster and smaller computers.

C. Walker Dix, chief engineer of Honeywell's Large Systems Div. said the company eventually intends to take the technology down the line. He also said he expects Honeywell to use the technology in computer memories (currently it is used only in logic circuitry), "but not in the near term. It depends

on the timing of the price cross-over compared to MOS RAMS."

### A Major Element

As a major element of DSE, Honeywell also announced support of a standard bit-oriented protocol, High Level Data Link Control (HDLC). The company described HDLC as offering significant advantages over earlier protocols, with code transparency and ability to accommodate two way simultaneous operation.

RICHARD G. MEISE
Primary marketing emphasis is to existing customers

NORMAN N. FELDMAN
CML and micropackaging are "the technologies of tomorrow"

And if Honeywell is announcing tomorrow with its DSE, it could be said to be catching up with yesterday in launching its full scale marketing efforts for Multics. Design activities for Multics began in 1965 as a joint activity of General Electric and the Massachusetts Institute of Technology. Honeywell got into the act when it purchased the GE computer operation in 1971. Multics became operational as an MIT campus computer business in 1969. In 1973 a selective sales campaign was attempted and MIT's interest was terminated. It became exclusively a Honeywell product.

"Its orientation was scientific timesharing," said Warren D. Martin, manager, Multics marketing. "Honeywell felt it had shortcomings for commercial use, such as lack of Cobol, and set out to conduct an aggressive research and development program. The last of the key software packages were delivered in 1975 and we got into full scale marketing last year."

Martin said Multics offers users four major benefits: productivity, management and control, expandability, and security. Both Martin and Ronald R. Riedesel, senior product manager, Multics marketing, deplore the fact that Multics is well known mainly for its security features, although they both believe "it is the most secure system today." They agree too that this will be a plus feature for Multics "when industry gets around to addressing privacy issues."

What they don't like is that people "think security is all Multics offers, and it offers so much more." They point to the fact that two of their big users, the U. S. Geological Survey and Industrial Nucleonics, whose system is used in process control for pulp and paper, have no particular security problems. Multics currently is installed at 10 sites.

### No Dead Ends

Riedesel likes to stress the fact that Multics can provide a variety of services and operate in a variety of modes—batch, RJE, transaction processing, etc.—simultaneously and with no dead ends for the end user. He said there is no restriction on languages used to access data bases or files.

He said Multics has a totally on-line orientation, with an inverted operating system oriented toward service to a terminal user. A batch job, he explained, is treated as a terminal user who doesn't have a terminal.

There is no job control language (JCL) with Multics, Riedesel said. "It responds to specific commands. It features total sharing of languages, data bases, applications packages, user codes, and data but with the capability for privacy restrictions."

He called Multics the "most powerful software development system today," pointing out it can write programs, debug converted software, provide archiving, editing, and automatic structuring. "You can even open up the code and modify it."

Riedesel said Multics has had virtual memory longer than any other vendor—since 1969. And the "Multics Data Base manager gives the user a choice between the network and relational approach to data base management."

### Word Processing

Word processing capability is a Multics feature highly touted by Martin and Riedesel. "We use it for all our documentation. We pull material off the system camera ready." The system also interfaces with a page printer. It has an on-line dictionary which goes through 50,000 correctly spelled words and can handle automatic hyphenation, automatic suffixing, document formatting, list processing, form letters, and electronic mail.

Its graphics systems, Riedesel said, can include nongraphic information and dynamic animation.

The system affords priority scheduling in that each user is guaranteed a certain percentage of the cpu. If response time becomes a problem, he said, a supervisor can change the allocation instantly from a remote location. "If throughput starts to degrade you can find out with metering, and tune it on the fly."

Riedesel said source code is always delivered with the operating system. "We never deliver a patch. If you find a bug we send the source code out."

Unattended operation is possible because of a protective feature which shuts the system down if there's trouble. "We run in Phoenix over the weekends with no operator present. The first time there's a problem the system goes down, tries to correct the problem, and comes back up again. If it happens again the system says 'Oh I must really be sick; I'd better go down and stay down.'"

Multics runs on Honeywell level 68 hardware but is compatible with level 66 GCOS (General Comprehensive Operating System) and can run in a GCOS environment.

All hardware is modular, and a 10 times growth factor is possible—up to a six processor system with 512 disc devices and a trillion bits of on-line storage, Riedesel said.

All this and security too.

—Edith Myers

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