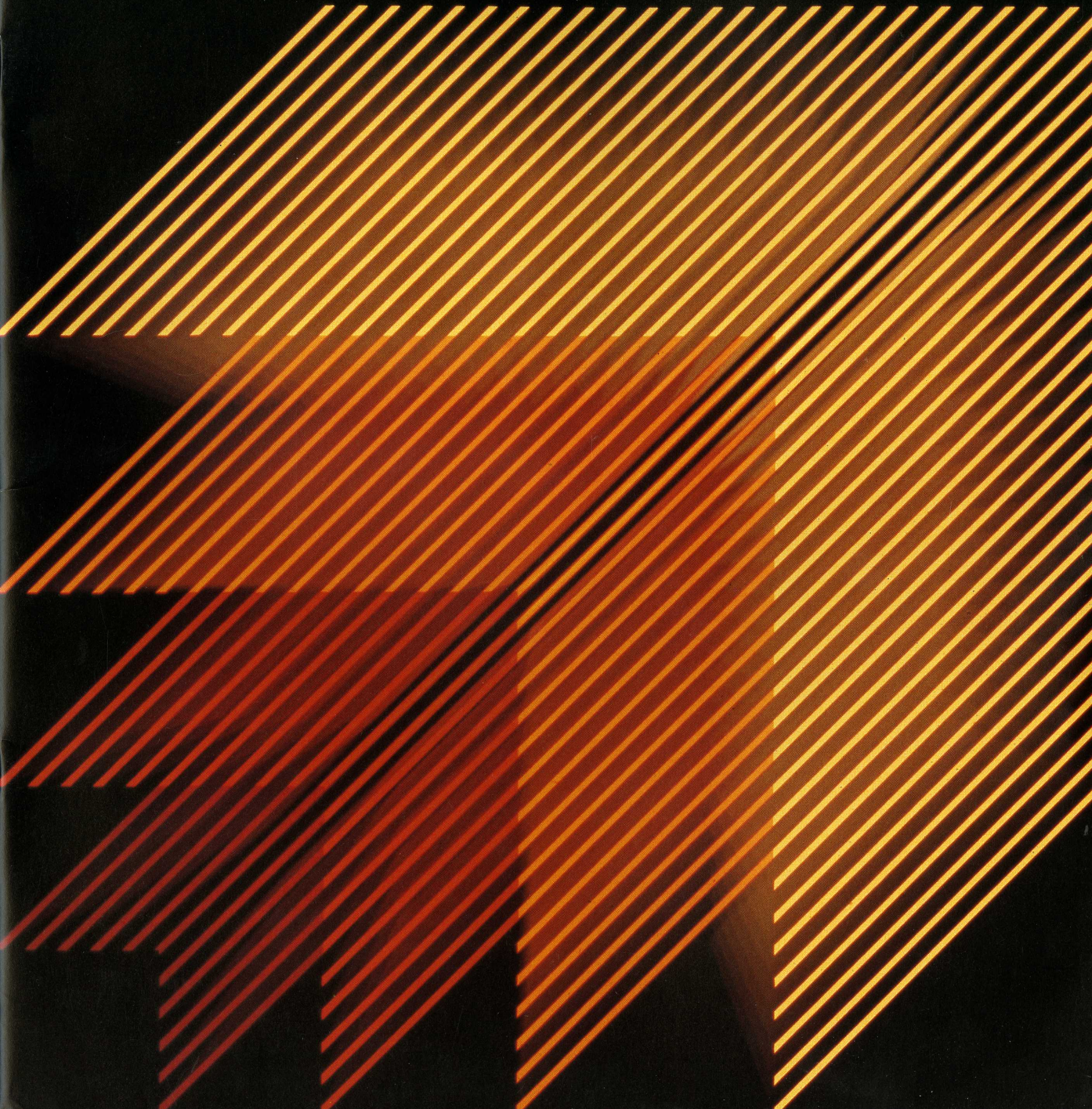




The IBM 4331  
Processor

...growth system to a  
new era in full-function  
data processing







IBM has a new computer that establishes new standards in delivering advanced data processing capabilities at low cost. Available now in Model Groups 1 and 2, the IBM 4331 Processor offers a wide range of field upgradable speed and storage capacity for concurrent operation of high potential benefit applications like data base management, data communications and interactive computing.

Exceptionally compact, yet more powerful than many larger systems, the 4331 Processor is designed to provide these advanced computing benefits at

a cost comparable to or less than what you're probably paying now for a system with less applications capability.

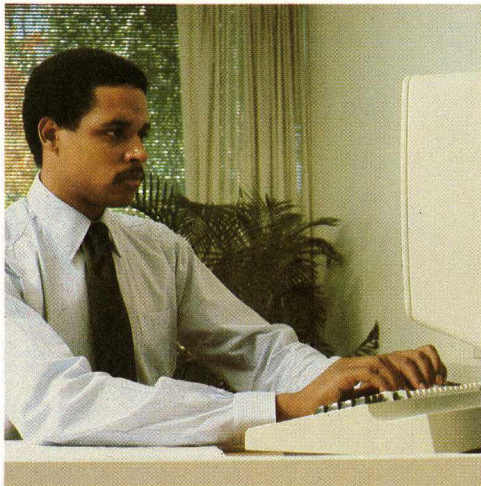
This is made possible through the use of advanced large scale integration (LSI) technology, which provides greatly increased computer speed, capability and reliability at reduced cost.

As an entry and growth system member of the IBM 4300 Processors, the 4331 Processor is fully compatible with the more powerful IBM 4341 Processor, as well as with System/370 and System/360 models.

Check the 4331's credentials: a virtual storage processor with up to four million bytes of low-cost main memory ... internal speeds that rival larger systems ... use of LSI technology ... input/output units ... preconfigured software ... and enhanced maintenance features aimed at improving overall systems reliability, availability and serviceability while helping to minimize the need for preventive maintenance.



**Unprecedented growth opportunities**  
These are some of the 4331 highlights. But there are many more, including extended versions of proven operating systems, a broad base of software systems with enhanced levels of function and ease of use, and compatibility features and installation aids to help you move smoothly into the arena of high-payback online applications... unencumbered by current system constraints and unacceptable costs.



Perhaps you want better capture and control of valuable data and faster access by the people who use it... when and where they need it. Or use interactive capabilities for problem solving and to speed application development. In either case, the potential benefits can improve productivity of your data processing department and end user departments.

The 4331 provides you opportunity to capitalize on its resources and achieve data processing economies through an unprecedented level of price/performance.

#### **Capitalizing on LSI**

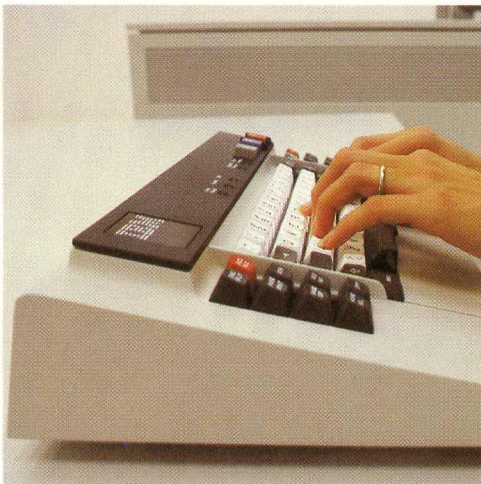
The 4331 improvements in price/performance are solidly grounded in proven System/370 architecture and the use of advanced LSI technology for main memory, logic and control storage. This innovation translates directly into substantial savings for you in a number of ways.

One of the many benefits of this technology is that power and cooling requirements for the 4331 are substantially reduced; for example, for Model Group 1 they are 30 and 45 percent less respectively than for the System/360 Models 30 and 40.

LSI miniaturization also helps to account for the significantly improved system reliability and availability... and simplified maintenance.

Most important, LSI is the direct source of the new levels of capacity and price/performance. The internal speed of Model Group 1, for example, ranges up to five times faster than that of the System/360 Model 30... while Model Group 2 is approximately two times faster internally than Model Group 1, a dramatic increase in data handling speed made possible by standard 8K buffer storage on Model Group 2 processors.

Greater execution speeds, combined with main memory options from one-half to four-million byte sizes, and Virtual Storage capability, give the IBM 4331 Processor the capacity to provide combined data base/data communications (DB/DC) and interactive functions—functions available previously only on large, more expensive systems—at an affordable price.









### **New features and devices**

A host of new 4331 features and devices gives you a high degree of configuration flexibility, enhanced even further by a number of low-cost integrated adapters that let you attach new I/O devices without the need for additional control units.

**High-speed buffer.** A high-speed 8K byte buffer storage, standard on Model Group 2, significantly reduces access time to processor storage to increase data handling speed.

**Up to 131,072 bytes of reloadable control storage.** The advanced use of microcode allows the implementation of vital system functions at low cost ... and with improved performance because frequently used system control programming routines can be executed much faster than by standard software methods. In addition, microcode is used to implement many available emulation and compatibility features designed to ease migration to the 4331.

### **More channel options**

Optional on the IBM 4331 is a byte multiplexer channel which provides for concurrent operation of many low-speed devices. For simultaneous operation of high-speed devices, optional Block Multiplexer Channels are available: one on Model Group 1 with a data rate of up to .5 megabytes/second and two on Model Group 2 with data rates up to 1.25 megabytes/second. Model Group 2 can also have an optional High-Speed Block Multiplexer Channel with a data rate of up to 1.86 megabytes/second to allow attachment of high-speed devices such as IBM 333X, 334X, 3350 and 3370 direct access storage devices via control units.

**Display/Printer Adapter.** This standard feature of the 4331 provides for the integrated attachment of up to eight local display terminals and printers including the operator's display console. A low-cost optional feature allows attachment of up to 16 of these devices including the console. Display terminals can be used for online and interactive applications. Printers, attachable via this feature, range in speeds from 80 characters per second up to 650 lines per minute.

**Display console.** The IBM 3278 Model 2A Display Console has a 1,920-character display and keyboard for fast, easy interaction with the system. It's also designed for use by the IBM Customer Engineer to display service information and initiate diagnostic routines. Additionally, a 3287 Printer with speeds up to 120 characters per second may be attached.

**Printers.** The IBM 3203 Printer Model 5 prints at speeds up to 1,200 lines per minute. It features a self-contained control unit, high print quality and a low noise level. The 3203-5 attaches to the 4331 via the byte or block multiplexer channel.

Also available are the compact, low-cost IBM 3262 Printer Model 1 with print speeds up to 650 lines per minute ... the IBM 3262 Model 11 with speeds up to 325 lines per minute ... and the IBM 3289 Model 4 at speeds up to 400 lines per minute. All three printers are attachable via the Display/Printer Adapter.

And for high-quality, high-speed printing, the IBM 3800 Printing Subsystem, which prints up to 20,000 lines per minute, is available.

**DASD devices.** The first is the compact, economically priced IBM 3310 Direct Access Storage device. Using a low-cost integrated DASD adapter, you can attach up to 16 IBM 3310 drives for fast access to online storage, ranging from 64.5 million to more than one-billion bytes.

With the high-performance IBM 3370 DASD, you can attach up to 16 drives via the integrated adapter, providing more than nine billion bytes of online storage in increments of 570 megabytes. Further, you can add a second, optional DASD adapter to the 4331 Processor Model Group 2 to attach and intermix up to 32 IBM 3310, 3370 or 3340 drives. Both the 3310 and 3370 are fixed media devices, sealed to reduce possible contamination and increase overall reliability.

**String switching capability.** This feature of the DASD adapter permits sharing of IBM 3370 drives with another IBM 4300 Processor, or switching of 3340/3344 strings with most System/370s.

**DASD compatibility.** To facilitate transition from System/360s and System/370s to the 4331, the 3370 can emulate 23XX, 333X and 3340 disk files. Emulation of 23XX disk files is also available with 3310 drives. This data compatibility means that users of these older devices can move to 3370s without the need for changes to DOS, DOS/VS, or DOS/VSE programs.

**Versatile tape drive.** The IBM 8809 Magnetic Tape Unit offers dual operation: in start/stop mode, it meets journaling and processing needs with a data rate of 20,000 bytes per second. While in high-speed streaming mode of 160,000 bytes per second, the 8809 is also a logical choice to back up and restore data on direct access storage devices. Up to six 8809s can be attached via the low-cost integrated adapter. Additional tapes, including IBM 3420s, may be attached to the block multiplexer channel.

**Diskette drives.** In addition to the standard diskette drive used for systems functions, there is an optional second drive for use of compact diskette media in addition to or in place of punched cards.















### **Programming support**

The 4300 Processors are supported by three operating systems—the Disk Operating System/Virtual Storage Extended (DOS/VSE), Operating System/Virtual Storage 1 (OS/VS1) and Virtual Machine Facility/370 (VM/370).

### **Choice of operating modes**

You can operate the 4331 in either System/370 mode or Extended Control Program Support: Virtual Storage Extended (ECPS:VSE) mode.

Operating in System/370 mode, you can run virtually any program written for System/360 or System/370. Also in this mode, you can use the feature, ECPS:VM/370, to significantly improve system performance when running the VM/370 operating system. For users operating in ECPS:VSE mode, the 4331 provides enhanced performance while running under DOS/VSE.

### **Easier to install**

Thanks to a new, more productive installation aid, installation of your IBM 4331 Processor can proceed smoothly and quickly. The aid, called the System Installation Productivity Option/Extended (System IPO/E), can reduce startup time because it delivers the operating systems and key supporting software products all pre-generated as a total system... as well as preconfigured to meet hardware system and application software needs.

System IPO/E also helps to simplify system operation, because it features interactive facilities that provide on-line prompting to help programmers, operators and end users select and complete their tasks.

To assist users moving from other data processing systems—such as the IBM 1400-series, System/360 and System/3 models—the 4331 also provides system compatibility features, device emulators and conversion aids.

### **Putting the 4331 to work**

The new dimension of the 4331's capacity, price/performance and versatility is impressive. But the real question is: once the 4331 is installed, how will it help to address your current concerns—such as rising labor costs, declining rates of productivity improvement and escalating material prices?

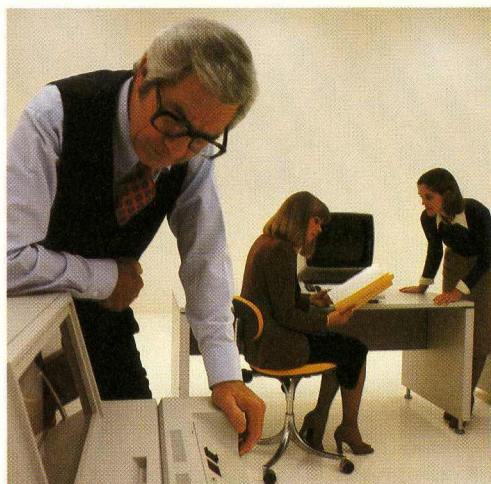
The answer is that the IBM 4331 Processor now makes it easier to move into data base/data communications and interactive computing areas with high-payback potential because they give you a better way to make more current and pertinent information readily accessible to those you depend on to run your business.

### **Data base/data communications support**

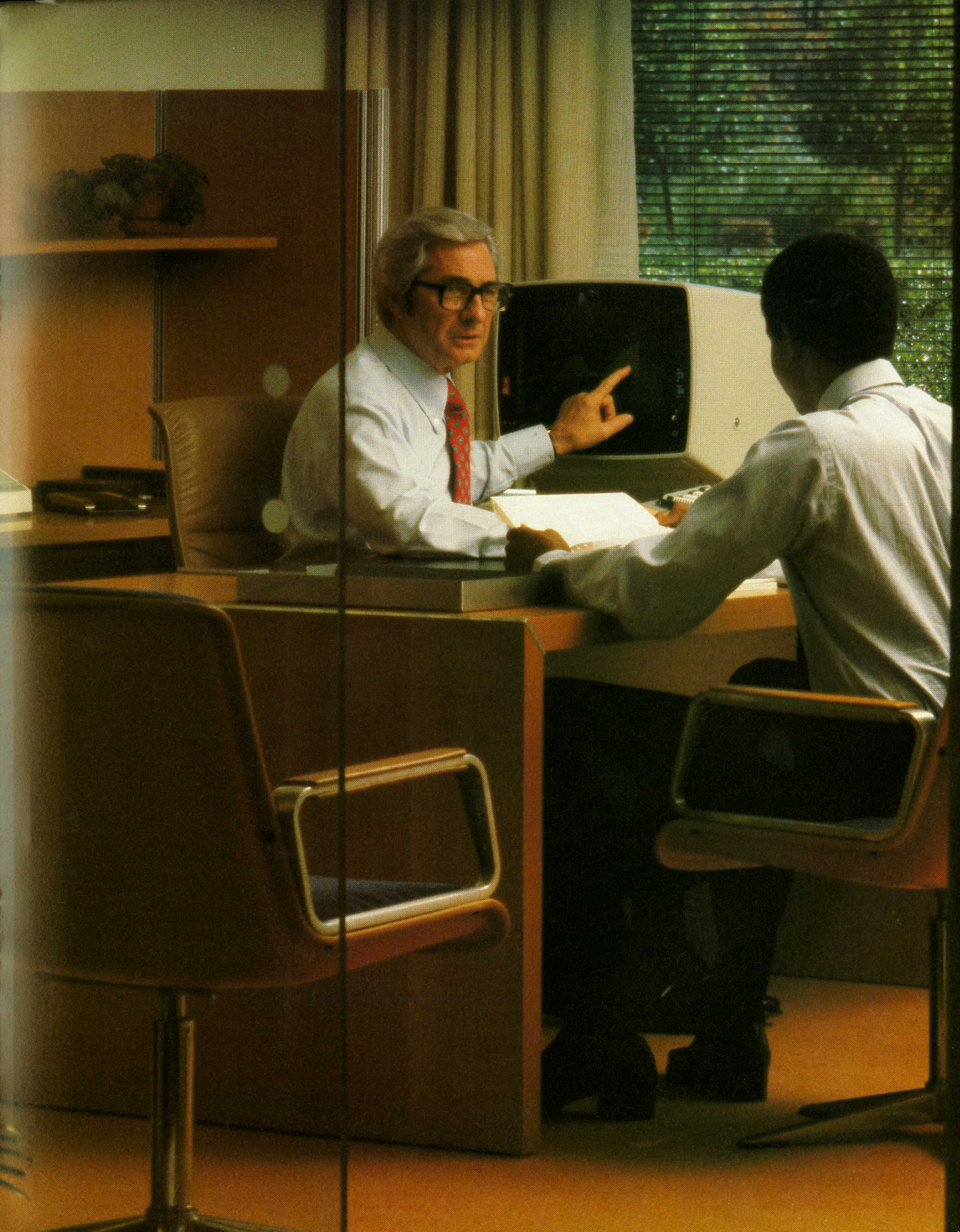
If you place a premium on the availability of better information to improve productivity, the 4331 can give you a cost-effective way to build a reliable, secure data base. This can be accomplished with a new version of Data Language/I (DL/I DOS/VS) especially designed for the 4331.

In addition, IBM's proven Customer Information Control System/Virtual Storage (CICS/VS) permits you to put any number of unrelated applications online. This advanced program provides most of the control facilities you need, including inquiry and update, generic file search, data collection, data entry and message routing.

Along with CICS/VS, the high-productivity online application generator, Development Management System/Virtual Storage (DMS/VS), can be utilized by programmers or by end users. The developer simply supplies application specifications interactively to DMS/VS, and DMS/VS creates the necessary code to implement the application—usually 5 to 10 times faster than by traditional methods.











Photographs show design models



### **Interactive computing support**

With the additional power and capacity range of IBM 4331 Model Group 1 and Model Group 2, you can now extend direct computer access to more problem solvers throughout the organization.

Once the special province of large-capacity high-cost systems, interactive computing benefits can now be yours through the VSE/Interactive Computing and Control Facility (VSE/ICCF) and the Conversational Monitor System (VM/CMS). Easy to learn and use, these time sharing facilities enable programmers, engineers, financial analysts—almost all problem solvers—to work at their own terminals, creating and managing files, compiling, testing and executing programs in less time, getting cost-saving applications up and running sooner.



### **New maintenance concept**

The IBM 4331 Processor is not only easy to install and use productively, it's also capable of helping to maintain itself.

The 4331 can do this because it automatically analyzes its own failure symptoms and generates a "reference code" containing information that identifies the source of trouble. The code is simultaneously logged on the same system diskette used to load microcode and displayed on the console to alert the operator. In most cases, error-correction procedures will automatically return the system to normal operation.



If a problem is sufficiently serious, your IBM Customer Engineer can make a teleprocessing connection to an IBM Remote Support Facility—via a separate support subsystem in the 4331 which can operate even when the system is not operational.

This gives the Customer Engineer direct access to the latest service information and to prompt response from a team of IBM technical support specialists. If necessary, the specialists from this central location can examine the 4331 reference code... execute diagnostic routines... and even apply problem fixes directly through the system diskette.

Remote yet responsive, this support can help to reduce system outages... because it allows both you and IBM to detect and fix problem symptoms sooner. And, given the inherent reliability and serviceability of the LSI-based 4331, that means your maintenance needs can be reduced to an "exception only" basis.

### **The system with a future**

If you're looking for a sensible, low-cost entry to full-function data processing, the IBM 4331 Model Groups 1 and 2 offer a new growth dimension worth considering. They can provide all the power and capacity you require today and the ability to grow the way you want to... for years to come.

Ask your IBM Data Processing representative for more details about the IBM 4331 Processor. It's a system that can hasten your move into full-function data processing.









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