

Computer Technology for Industry

A special NASA service is contributing to national productivity by providing industry with reusable, low cost government-developed computer programs



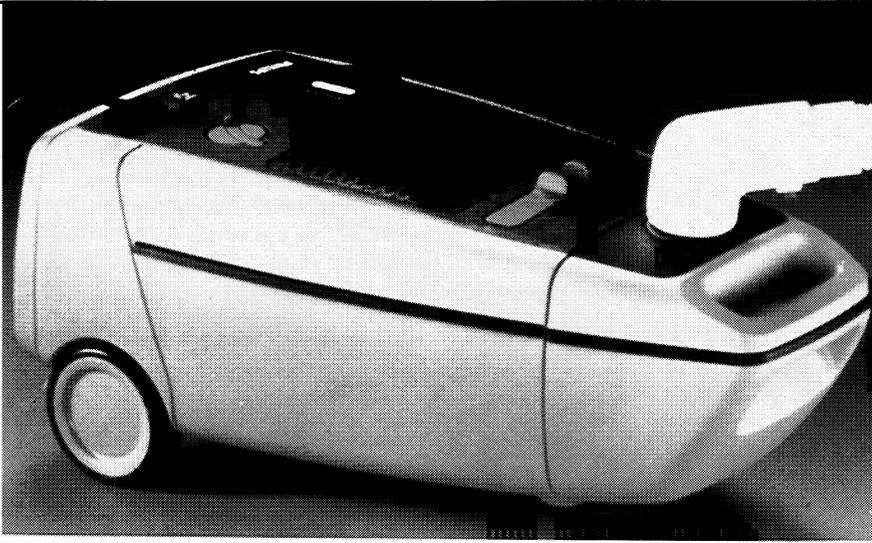
Shown above is the Shell Oil Company plant at Norco, Louisiana, one of several at which the company produces chemical compounds used in the manufacture of plastic products. Examples of the many products include children's toys,

vacuum cleaners, coffee makers and fruit juice bottles. Shell is among the many companies which have benefited from use of NASA/COSMIC computer programs in industrial operations.



Information processing by computer is experiencing explosive growth in the United States and multifold expansion is predicted for the 1980s. Spurred by the need to improve business efficiency in today's uncertain economic environment, thousands of companies are joining the ranks of computer users annually, while longtime users are regularly finding new ways to improve their operations by computerization. In the interests of national productivity, NASA is helping American businesses to reduce automation costs through use of previously developed computer programs that have secondary utility.

Computer programs, called "software," are sets of instructions that tell a computer how to draw upon its stored input to produce desired information or effect. Development of an entirely new program is time-consuming and expensive; software costs sometimes amount to 30-40 percent of the total cost of computerizing a business or



a process. Frequently, however, a program developed for one purpose can readily be adapted to a totally different application. Thus, industrial software users can save time and money by taking advantage of a national resource available to them: the large "bank" of computer programs developed in the course of work sponsored by NASA, the Department of Defense and other technology-generating agencies of the government.

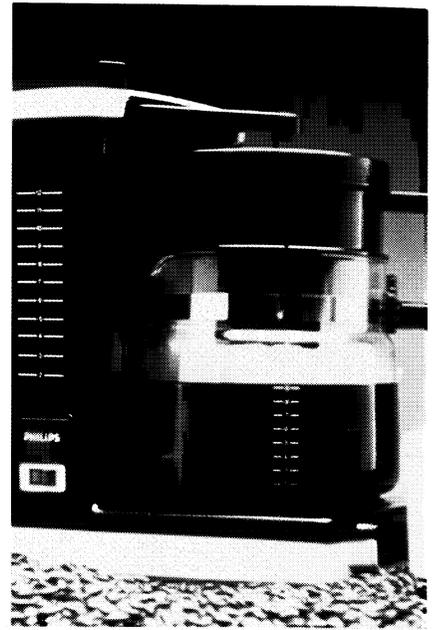
NASA's mechanism for making such programs available to the private sector is the Computer Software Management and Information Center (COSMIC)[®], located at the University of Georgia. COSMIC gets a continual flow of government-developed software packages and identifies those that can be adapted to secondary usage. The Center stores the programs and informs potential customers of their availability through a catalog and the NASA publication *Tech Briefs*.

COSMIC's library numbers more than 1,500 programs applicable to a broad spectrum of business and industrial applications. COSMIC customers can purchase a program for a fraction of its original cost. In most instances, users get a return many times their investment, even when the cost of adapting the program to a new use is included. Industry's acceptance has been extraordinary; the Center has distributed thousands of programs, some of which have made possible savings amounting to millions of dollars. Thus, COSMIC's service represents one of the broadest areas of economic benefit resulting from secondary use of technology developed by the government.

An example of how this technology aids industry is the use of a COSMIC program by Shell Oil

Company, Houston, Texas. Known principally for its oil products, Shell is also one of the nation's largest manufacturers of chemical products. At several facilities, Shell produces chemicals for plastic products used in the manufacture of automobiles, housewares, appliances, film, textiles, electronic equipment and furniture.

In developing a new computer code for analyzing polymers—chemical compounds—researchers of Shell Development Company's Mechanical Engineering Section used a COSMIC program, developed by Jet Propulsion Laboratory, called VISCEL. Computerized analysis of structures made of lightweight plastic polymers provides feedback to polymer scientists as to how a proposed polymeric composite structure will perform. Such structures are employed in manufacture of parts for industrial



users, including automotive companies, who seek decreased component weight but also require the strength equivalent of metal parts. The COSMIC program was used to insure the accuracy of the company's new computer code. Shell Development Company reported that there were no other programs available that could provide the necessary calculations.

Additional examples of how COSMIC programs are contributing to national productivity are described on the following pages. Other examples are listed elsewhere in this volume in the chapters on transportation and medicine.

