

NASA is contributing to national productivity by providing to businesses government-developed computer programs which are adaptable to industrial use

# Computer Technology for Industry

In this age of the computer, more and more business firms are automating their operations for increased efficiency in a great variety of jobs, from simple accounting to managing inventories, from precise machining to analyzing complex structures. In the interest of national productivity, NASA is providing assistance both to long-time computer users and newcomers to automated operations. Through a special technology utilization service, NASA saves industry time and money by making available already-developed computer programs which have secondary utility.

A computer program is essentially a set of instructions which tells the computer how to produce desired information or effect by drawing upon its stored input. Developing a new program from scratch can be costly and time-consuming. Very often, however, a program developed for one purpose can readily be adapted to a totally different application.

To help industry take advantage of existing computer technology, NASA operates the Computer Software Management and Information Center (COSMIC)<sup>®</sup>, located at the University of Georgia. COSMIC maintains a large library of computer programs de-

veloped for NASA, the Department of Defense, the Department of Energy and other technology-generating agencies of the government. The Center gets a continual flow of software packages, screens them for adaptability to private sector usage, stores them and informs potential customers of their availability.

COSMIC's service represents one of the broadest areas of economic benefit resulting from secondary use of technology. Programs are sold at a fraction of their original cost and in most instances users get a return many times their investment; savings sometimes amount to millions of dollars. The service has met with extraordinary industry acceptance; software packages distributed to industry number in the thousands.

Best known and most widely used of COSMIC's packages is the NASTRAN<sup>®</sup> program, an acronym for NASA Structural Analysis Program. NASTRAN is a general purpose program which electronically analyzes a design and predicts how it will stand up under the various conditions of stress and strain it will encounter in operational service. This permits engineers to study the structural behavior of many different designs before settling on a

final configuration. NASTRAN has found hundreds of industrial applications and almost invariably users report substantial time and money savings.

There are more than 1,500 other computer programs available to the private and public sectors through COSMIC. Collectively, they embrace a broad spectrum of industrial applicability. Among examples of how they are being used are two in the food processing industry:

Ralston Purina Company of St. Louis, Missouri, a diversified producer of food and animal feed, found a COSMIC program called STRCMACS a valuable aid to its own computer technology; STRCMACS is used for the conversion of other computer programs and for development of new computer systems. The company reports that it achieved significant savings by getting the software from COSMIC rather than buying a comparable program or developing a new one. Purina also effected additional savings in reduced development time.

A. E. Staley Manufacturing Company, Decatur, Illinois, similarly reports monetary and time savings through use of two COSMIC programs, one called ANOVA (Analysis of Variance) and another which has no acronym for its technical title. These programs were used in research and development on management functions and on ways of processing corn and soybean products, such as corn starch, syrup, soybean oil and animal feed.

Additional examples of how COSMIC programs are contributing to industrial productivity are contained on the following pages. Other examples are listed elsewhere in this volume in the chapters on transportation and construction spinoffs.

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*Ralston Purina Company is conducting extensive research on the complex structure of the soybean to improve soy protein for sale to other food manufacturers. The company is one of many which have employed NASA/COSMIC computer programs in industrial operations.*

*In these photos, a truckload of soybeans spills down a chute at a processing facility of A. E. Staley Manufacturing Company. A leading food processor, Staley used COSMIC computer programs in research and development on ways of processing corn and soybean products.*

