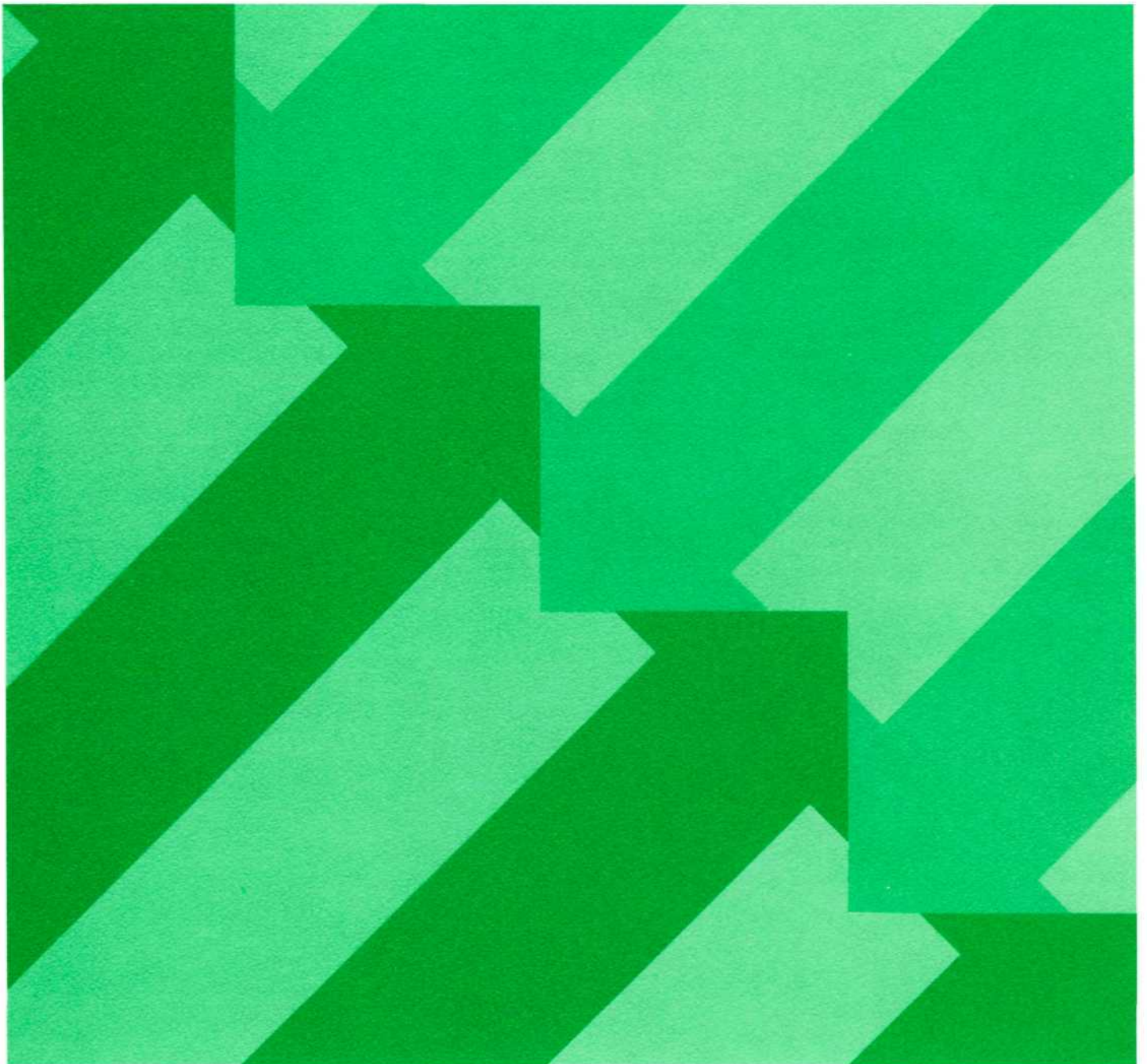


# Tesdata

SYSTEMS CORPORATION



# INTRODUCING

# Tesdata

The rapid growth of computer usage and resulting expenses to enterprises and government has created a requirement to pursue means for effectively managing computer hardware and personnel assets, plus to obtain optimum usage of each. The initial attention to computer costs created the "third party" computer leasing in the early 60's. This was followed by the "plug-to-plug" compatible peripheral industry. The most recent development of advanced means for measuring, simulating, optimizing and scheduling of computer hardware and programs is rapidly gaining acceptance by the influential users of computer systems, and is the latest move toward obtaining optimum performance. It is these latter areas that are the focus of Tesdata Systems Corporation.

Tesdata is a leader in this field of providing products and services for improving computer performance. The broad line of its products makes the company unique in this highly specialized segment of the computer field, and the success of Tesdata demonstrates the rapidly growing acceptance of its capabilities and products among major computer users throughout the world.

The company's wealth of practical experience in advanced data management and communications systems coupled with its expertise in computer measurement, simulation, and scheduling provides the diversity of skills essential in providing practical assistance to some of the most advanced users of computer systems. Tesdata clients include leading corporations among airlines, utilities, banks, insurance companies, railroads, state and federal governments, consultants, and numerous types of manufacturers.

The operational structure of Tesdata consists of five basic areas, with each group appropriately staffed for handling its current base of clients, new customers and prospects, plus product improvements. The five areas and their capabilities are:

## ANALYTICAL SERVICES

This division of the company is heavily experienced in the area of system architecture and programming of on-line, real time data management systems. Its major assignment during the past year consisted of an average of ten men in direct support of implementation of capabilities for management of data in a real time, on-line environment utilizing Honeywell G-635 Systems at a federal government installation. A second effort was to perform system architectural design in the area of data communications and data management systems for an IBM 370/155 System in a large commercial account.

## MEASUREMENT SYSTEMS

This department is responsible for the manufacturing, installation, support and maintenance of the X-RAY Computer Performance Measurement System and for contract measurement services for users throughout the world. X-RAY Systems and services have been provided to customers using IBM, UNIVAC, Control Data, Honeywell, RCA and ICL computer systems. Department personnel have broad systems and applications backgrounds to complement in-depth measurement analysis experience.

## OPTIMIZATION SYSTEMS

This department is responsible for products, services and instruction in COBOL program optimization. Department personnel install, support, and maintain the STAGE II COBOL Source Program Optimizer, conduct seminars in COBOL

optimization techniques, and offer a proven by-mail service for COBOL source code optimization to meet customer one-time or occasional requirements.

## SCHEDULING SYSTEMS

This department is responsible for the installation, maintenance and applications support of the corporation's scheduling products. DEADLINE is the unique computer center scheduling system currently installed in data processing operations of major corporations throughout the country. A second product, STREAMLINE, is a computer system job stream scheduler for increasing throughput performance and job turn-around response.

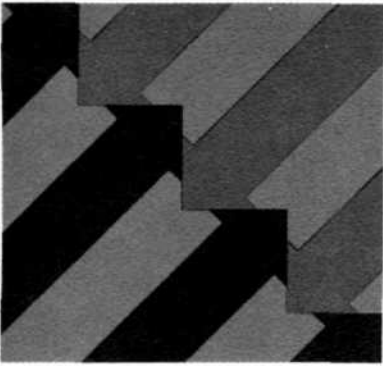
## SIMULATION SYSTEMS

This department is responsible for the installation, maintenance and support of the CASE Simulation System and for performing contract simulation services. As the corporation's first major product, CASE has been accepted by over one hundred customers in its three-year history. CASE IV, the latest version, together with the recently developed SMF/CASE Input Processor for automating workload definition, has convinced a number of experienced simulation users to recognize the system as being the most advanced available from industry today. The experienced staff supports CASE installation and service activity and performs a continuing function of product improvement and library enhancement.

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# X-RAY

## Computer Performance Measurement System

Any decision to increase system efficiency is as meaningful as the data available on current system performance. Similarly, the decision will have value only if its success or failure can be measured once it has been implemented. Making a performance decision based on fragmentary measurement data on current efficiency establishes a low probability of success in improving operating performance. Of course, given an inadequate measurement capability, it is equally improbable that efficiency increases (or decreases, for that matter) will be accurately detected after a performance decision has been executed.

X-RAY (Execution—Recorder Analyzer) removes the guesswork involved in making constructive system decisions and verifying their effectiveness. X-RAY reports actual operating performance on which to base sound system improvement decisions. The validity of these decisions, once implemented, can then be shown using X-RAY to measure their precise effectiveness. Making wise performance decisions is a prerequisite to maximizing system efficiency. There is no better way to ensure success in making these decisions than to apply comprehensive measurement using the most capable system available: X-RAY.

### WHAT WILL X-RAY MEASURE?

Virtually everything. X-RAY measures all areas of computer system activity:

- Equipment
- System Software
- Application Programs
- Data

Unlike other measurement systems, X-RAY is not restricted to monitoring just your hardware. Of course, X-RAY does report on equipment utilization highlighting device usage and imbalances within your configuration. But X-RAY will also measure operating system activity providing demand and overhead statistics and isolating areas of high activity. Applications programs may also be monitored for structure and code efficiency, Data handling can be examined in depth to report on access overhead, file organization and device contention.

### WHAT RESULTS ARE POSSIBLE?

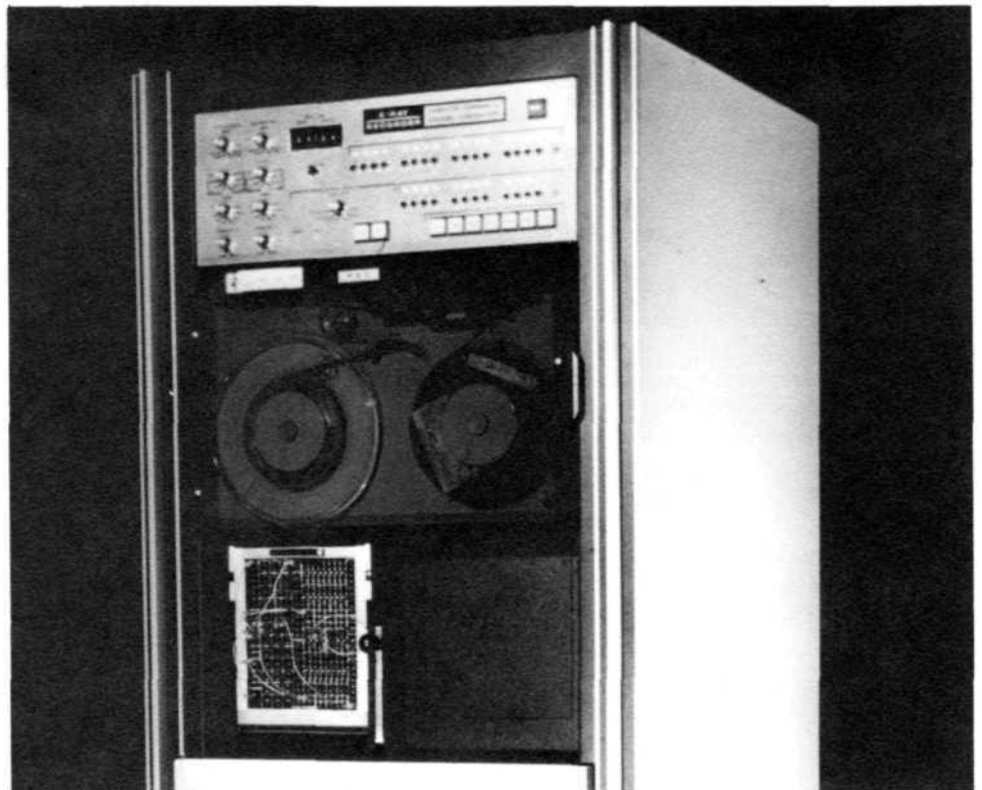
X-RAY pinpoints multiple areas of operating inefficiency so that many system improvement measures such as the following may rapidly be applied:

- Configuration Balancing
- Operating System Real location

- Problem Program Restructuring
- Data Base Reorganization
- Program Code Optimization

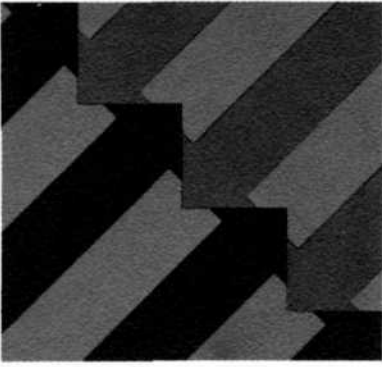
X-RAY gets results. In a single monitoring session at a Government agency it was discovered that 40% of the time spent by a major, processor-bound applications program was spent in only 10 instructions of the program—an excellent demonstration of isolation of high activity program code. Simple recoding did away with this significant bottleneck.

At a commercial installation, X-RAY pinpointed an inefficient directory search method causing overall throughput degradation exceeding 20%. An incredibly minor change was effected in a few minutes time remedying this situation.



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# STAGE II

## COBOL Source Program Optimizer

Until recently, users have been paying for the relative inefficiency of the COBOL language, resorting to hardware upgrades and additional operations shifts rather than attacking the problem at the source: the SOURCE program.

The gap between technical programming staffs and non-technical management has resulted in the frequent supposition, by COBOL users, that there is simply nothing that can be done to reduce the unnecessary overheads of their language.

For the first time since COBOL's adoption, however, the language has come under critical scrutiny, and simple methods of overhead avoidance have been developed. The results in decreased run times, core reductions and improved productivity have been dramatic.

### WHAT IS STAGE II?

STAGE II is a COBOL program. It is the automated implementation of tested optimization methods, analyzing source COBOL programs, producing a diagnostic listing and, where possible, generating hardcopy correction cards. Stage II inputs the target COBOL source program and produces a card image correction file for reinsertion into the original source program or library. These corrections are made for every inefficiency which can be corrected automatically in the working-storage section. A diagnostic listing is produced for each correction informing the user of the deficiency at the point where it occurs.

STAGE II produces an efficiency log which indicates additional modifications required for effecting total optimization of the program.

STAGE II includes a highly efficient alpha cross referencing sub-system which minimizes programmer interface and adds to program documentation.

STATE II allows for the insertion of installation parameters and will diagnose the use of any COBOL features which are pre-selected as being in violation of an installation's standards of programming.

### HOW MUCH TIME DOES IT TAKE TO OPTIMIZE A PROGRAM?

STAGE II does the complete analysis and correction card output in one-third compile time. Your programmer inserts the new source cards, looks over STAGE II's suggestions for total optimization and decides which of these to implement. He then makes the procedural coding revisions—this takes from ten minutes to an average of two to four hours, depending on the number of source cards—and the program is ready to compile, test and run.

### WHAT ABOUT TRAINING?

The lease of STAGE II includes an intensive one-day course in techniques of source program optimization for COBOL. Up to fifteen participants are trained, at your installation, by an expert in throughput optimization. Your key personnel learn how to write more efficient, faster running COBOL programs. With the aid of STAGE II output, each participant optimizes production programs at the workshop session. Text and materials are provided for each participant and emphasis is on actual use of the STAGE II package. In addition, your programmers become *optimizing* programmers, fully trained in the following: methods of more efficient data definition and coding techniques, avoidance of improper procedural coding, establishing "best type" and break-even points in all efficiency methods, defining data patterns and methods of using them to best advantage, deriving simple formulae for computing I/O requirements, knowing where and when to optimize, maximizing core conserva-

tion, establishing proper file organization and block sizes, and determining actual COBOL verb timings.

### WHAT RESULTS DOES STAGE II GIVE?

STAGE II has demonstrated that about 70% of all COBOL programs are highly optimizable. STAGE II maintains an average of 25% run time reduction, but users are reporting reduction of up to 47%.

STAGE II also accounts for sizeable decreases in core. Savings in one program alone can justify the total investment.

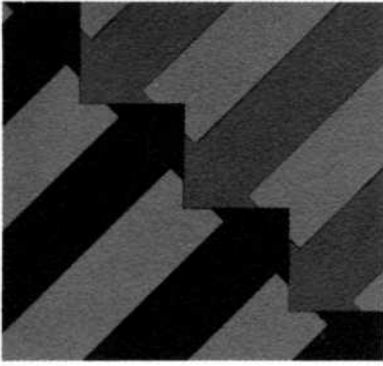
STAGE II serves as a continuing educational tool. Quite separately from the skills gained in the initial training, the software becomes a guide to beginning programmers in demonstrating proper coding techniques and introducing simple corrective measures to be implemented in their own programs.

STAGE II functions as an automated "standards manual." The software insures staff-wide observance of efficient coding methods, previously ignored by COBOL programmers.

STAGE II enables management, for the first time, to determine the level of inefficiency in its inhouse programs, thus bridging the gap between technical and non-technical staff. It also provides the programmer with the necessary information to correct the problem at its source—the SOURCE program.

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# DEADLINE II

## Computer Center Scheduling System

Too frequently the daily problems of computer operations tend to obscure the basic requirement of returning completed work to the user at the desired time. The processing of a job from the time it is received until it is returned involves a significant number of activities in addition to the primary function of computing. The most powerful computer available cannot be used effectively if input is not supplied in a proper and timely fashion, and output is not delivered to the user when it is required.

This last point is the most practical gauge of how well the center is performing its job. In many organizations the questions of "where is my work, when can I get it, or why can't I get it now" are most familiar. In attempting to answer these questions the data processing manager is faced with a most frustrating task because generally he doesn't know. Indeed the attempt to find a solution for the users leads to other questions from his management such as "why do you need more people, more equipment, more overtime?"

There is a mechanism available to you that answers these questions, and many more, before they are asked. The DEADLINE Computer Center Scheduling System tells you what jobs will be completed by your desired completion time, which will not, why not, and allows you to make corrections before the fact!

DEADLINE is a management control system for the monitoring and administration of the work flow and resources throughout a computer center. It produces predictive schedules and reports of how the work should be distributed across resources to meet pre-established completion times.

In addition to functional scheduling, the system instills a discipline throughout the center. All activities are coordinated and documented from the time work leaves the originator until it is returned. Summary reports show how personnel and equipment are employed, the total workload for the center, the total resource capacity, and whether or not work will be completed when desired.

### JOB PRIORITIES

DEADLINE incorporates a unique, yet simple, hierarchy scheme for job priorities. Priorities may be user specified or computer generated. They may be based on minimum throughput time, on meeting scheduled deadlines, or on acceptable waiting periods for low priority, nonproduction jobs. The DEADLINE priority control system automatically reviews and updates priorities in accordance with user-specified objectives.

### A COMPREHENSIVE SCHEDULER

DEADLINE produces complete schedules for all computer center jobs and activities. Job schedules trace work through each activity area (keypunch, EAM, compute, print, report control, etc.) while activity schedules provide shift schedules for operating and supervisory personnel. Schedules present start and completion time for each job task, manpower/machine assignments, and a summary profile of resource utilization against resource availability.

Flexible design provides for selective breakouts of schedules most meaningful to specific organizational and activity groupings. Schedules for specific machines are also produced where required.

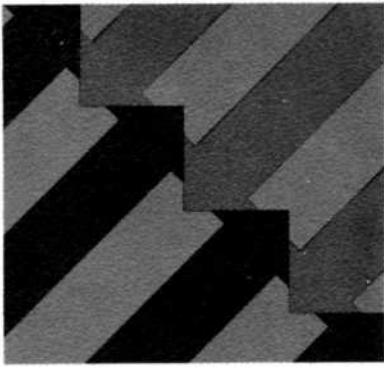
### A PLANNING TOOL

As a planning tool, DEADLINE will present hardware capability against a data center's unique workload in terms that are most meaningful to management, namely, the extent to which hardware capability directly affects the completion of jobs to schedule, throughput time, machine/manpower utilization and leveling, and overtime and shift requirements. DEADLINE provides the basis for continual examination of equipment capabilities in terms of changing user needs. DEADLINE provides data useful for equipment evaluation studies and for personnel staffing decisions, and in determining expansive capability.

### MULTI-PROGRAMMING PROCESSING

DEADLINE incorporates all the features to consider constraints and capabilities associated with multiprogramming processing with new third generation computers. Both overall program processing capability and dynamic allocation of capability are considered with a minimum of data inputs.

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# STREAMLINE

## Computer Operations Scheduler

The primary goal of computer operations is to provide timely and responsive return of work submitted for processing **with** a minimum investment in data processing equipment, software development, operating procedures, and staff organization. The attainment of this goal has been made substantially more difficult with the highly complex configurations available with current data processing hardware and software.

**The** rapid enlargement of data processing capabilities and flexibilities has created unique problems for data processing management. Because of the complexity of current data processing systems and the fact that millions of dollars and hundreds of people are involved and affected, no longer is a correct data processing decision readily apparent. Paradoxically, the personnel supplying the information needs of the corporation are obtaining the least information from the new capabilities and resources. It is an undeniable fact today, in the typical data processing environment, that a serious lack of management tools exist to plan, schedule, and control production processes in a data processing center. Without these tools and given this environment, rational data processing decisions cannot be made nor maximum operating efficiency achieved.

To be responsive to these needs, a data processing planning, scheduling, and control system must be closely tailored to the unique environment in which it is to operate. STREAMLINE is just such a system. Developed and tested in a computer center environment, STREAMLINE provides planning and control capabilities the computer center manager and his staff now need.

The implementation of STREAMLINE is responsive to the areas of management concern:

- Reduction of job reruns
- Reduction of late reports
- Improvement in total center thruput
- More cost effective computing
- Evaluation of changes in resource or workload networks
- Control of tape/disk proliferation

STREAMLINE provides for the timely management of a computer system workload. The STREAMLINE System provides automated scheduling of the major elements of the center environment including processors, peripheral units, and data sets. The scheduler produces a series of predictive reports designed for all levels of data processing management. These reports establish a common vehicle of communication for controlling the workflow. The utilities provide reports on the inventory and utilization of the center.

The capability for detailed workload specification and control techniques enables significant cost savings by improving effective utilization and increasing throughput on the most costly resources within the computer center. The system is designed to achieve planning, scheduling, and performance improvement objectives within the context of a computer center.

### A PLANNING TOOL

As a planning tool, STREAMLINE predicts future performance, permitting management to review in advance the performance within the center. Notification of peaks and valleys in the upcoming workload allow for early recognition and subsequent corrections of imbalances. STREAMLINE has the capability of specifying a computer center network and will support evaluation runs to determine the effect of equipment variation on an operationally defined workload.

### A SCHEDULING TOOL

As a scheduling tool, STREAMLINE provides multi-level management reports for an installation's defined scheduling period. These reports are then disseminated to cognizant staff personnel for establishment of common objectives and specific responsibilities. The scheduling interval is controlled by a simple input parameter and can vary from one hour to one week. All work to be scheduled is structured into jobs and then tasks within jobs. The jobs provide the majority of the scheduling parameters. The tasks complete this data and add the performance data used for intra-processor scheduling (multi-programming). Schedules are produced for individual processors, groups of processors, or external users, depending on the needs of management.

### PERFORMANCE IMPROVEMENT CAPABILITY

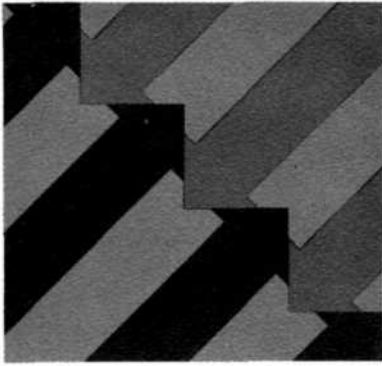
As a performance improvement capability, STREAMLINE provides for **the** scheduling of compatible tasks and leveling of workflow across all processors within the center. The system maintains a resource map and considers task performance data and resource requirements on a processor prior to scheduling. This allows jobs which can run on several processors to be scheduled on the one which can most effectively run the job. For the computer operator, the system provides a scenario of his shift workload, specification of his configuration, availability of resources for unscheduled work, and the initiator configuration to process the work. By knowing in advance his specific configuration and time phased workload, the operator has considerably more information on which to base his operational decisions.

Through the structures established by STREAMLINE for controlling, planning and scheduling of the total center workload, other valuable management data is derived. This data consists of:

- an inventory report of the quantity and attributes of tapes, disks and other similar resources being used in the center.
- a hardware inventory of the schedulable resources, specifying in addition their connectivity, status, and use.
- a common data library of the scheduling, performance and descriptive information for all jobs/tasks being scheduled.

These reports when complemented with schedule reports are of considerable value to data processing management in many critical decisions.

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# CASE

## Simulation System

Data processing decisions are becoming more difficult to make as computer systems and applications grow in complexity and sophistication. At the same time, these decisions can affect processing costs more significantly than ever before. Failure to recognize changing resource utilization or to anticipate the effects of new computing requirements can impact system performance and responsiveness with corresponding increases in operating costs. The lack of intelligent system management and planning can create a data processing nightmare.

How can more effective decisions be made in the complex environments of multiprogramming, multiprocessing, real-time, time-sharing, remote job entry, and total information systems? How are supporting facts and figures to be obtained for the evaluation and selection of a new computer system? What are the performance consequences of installing a new remote terminal system? What bottlenecks can be expected? How is response time affected? How will another manufacturer's peripheral equipment perform on the existing system? What is the optimum configuration to support a new application?

Clearly, to make wise decisions the proper tools should be used rather than basing decisions on partial data, rough approximations or sheer intuition.

CASE (Computer-Aided System Evaluation) is the tool used at many data processing installations to assist in making complex system decisions. CASE streamlines the decision-making process by providing a capability for accurate simulation of present and proposed systems and applications.

Important to CASE users is the ability to simulate data management systems such as IMS2 with its dynamic buffering characteristic. CASE clearly indicates the probability that a requested record exists in the buffer. It includes the processor overhead for the data management system.

### FEASIBILITY STUDIES

A CASE simulation quickly and accurately establishes the feasibility of a basic design approach. The study might involve either a new design or the incorporation of new features into an existing system or application.

### SYSTEM DESIGN

Through the use of CASE a large number of system or application design alternatives can be evaluated with minimal manpower and time investment. New designs can be explored with ease to improve existing systems and applications.

### COMPUTER SYSTEM SELECTION

CASE provides the ability to perform detailed competitive analyses of computer systems proposed by various manufacturers relative to each other and in response to fixed processing specifications. Optimum configurations for each manufacturer may be determined to meet existing or projected workloads.

### CONFIGURATION MANAGEMENT

For on-going configuration management, control and planning, CASE may be used to ascertain performance interrelationships of new equipment, system

software and applications. Using CASE, present and projected workloads may be specified in machine independent form which facilitates rapid, automatic, system redesign for analysis of various configurations.

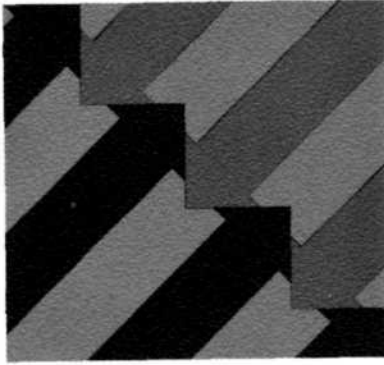
### CASE/SMF INPUT PROCESSOR

To ease the input definition to CASE, an auxiliary package is offered which automatically generates CASE input from SMF accounting tapes. The CASE input is extremely accurate, assuring precise simulations. But most importantly, minimum time and effort are required to prepare simulations.

The data created by the CASE/SMF Input Processor may be used to simulate any hardware configuration desired. The CASE input data is completely machine independent.

### NETWORK ANALYSIS

CASE provides a thorough teleprocessing network analysis unrestricted by the number of communication components defined in the system. A thorough analysis provides network component utilization and queuing information.



# TESDATA PRODUCTS USERS INCLUDE

Amoco Production Company  
Ampex Corporation  
Blue Cross Association  
Celanese Corporation  
Control Data Corporation  
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Union Oil Company  
United Airlines  
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RCA Indianapolis  
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