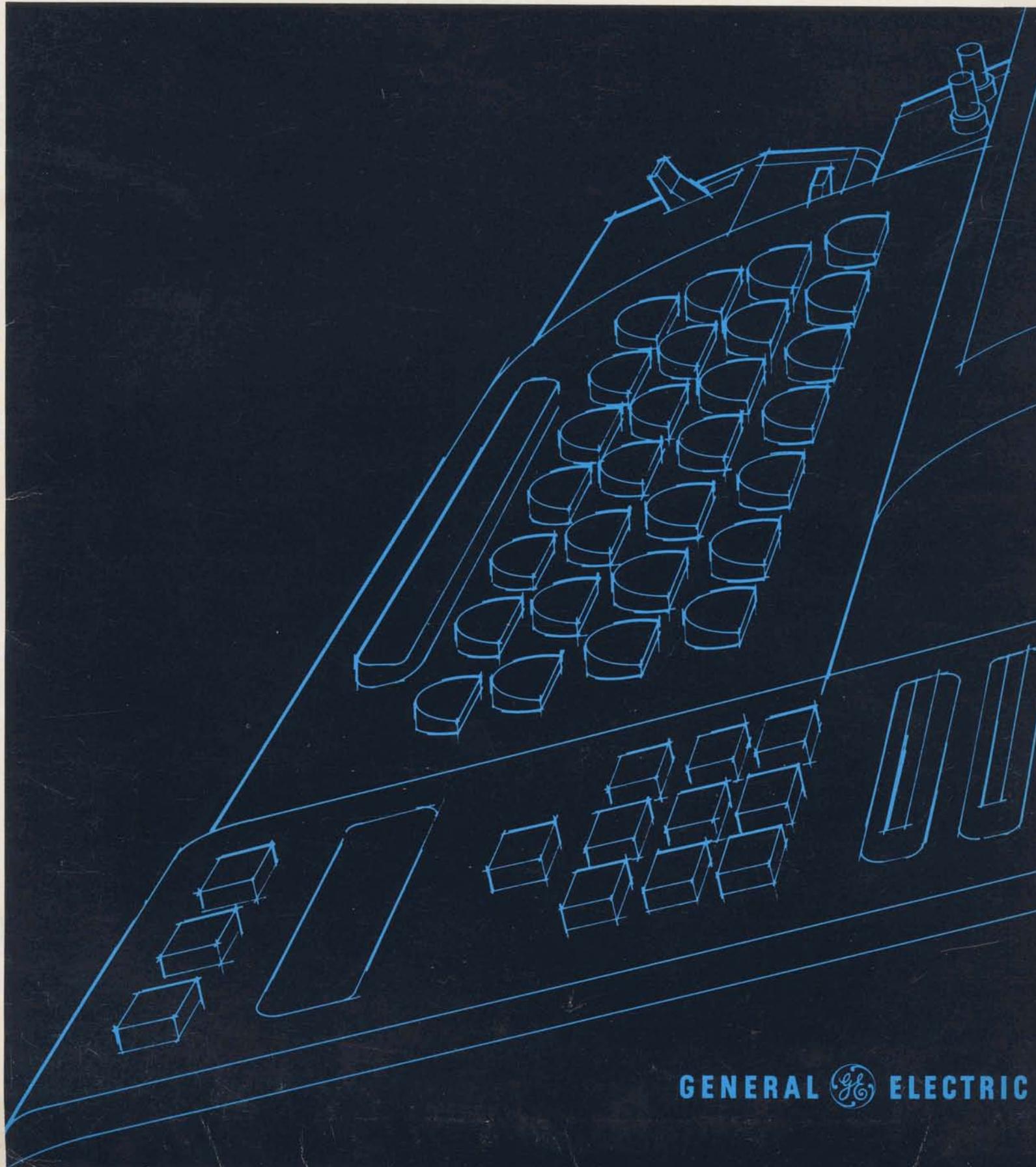


GE Time-Sharing Service



Time-Sharing
Service



GENERAL  ELECTRIC

General Electric Time-Sharing Service

On call—a million dollar system

Time-Sharing is a technique that lets many people use a computer at the same time, from many different locations.

Miles from your office sits a million dollar computer waiting to service you whenever you need it. Just dial a phone number at your office terminal, type your problem in familiar



language, and get back an answer.

At the same time, dozens of others are sharing the computer.

So the cost is shared, too.

Time-Sharing is simple. You don't have to be a computer expert to use it.

Time-Sharing is flexible. You can create, edit, test, update and store your own programs — right from your office.

Take a closer look at GE Time-Sharing Service with the information provided here.

Then give us a call.

GENERAL  ELECTRIC

NEWS BUREAU

68-210-13A

GENERAL  ELECTRIC

777 14th Street, N.W., Washington, D.C. 20005

Area Code 202-393-3600

J.P. Sweeney

(4-3-68)

BACKGROUND INFORMATION

Numerical Control Parts Programming
With GE Time-Sharing Service

COMPUTER TIME-SHARING

GE's Computer Time-Sharing Service, a product of the Information Service Department headquartered in Bethesda, Md., allows many people at scattered locations to use a remote GE computer systems at the same time from the convenience and privacy of their own office. The computer, linked by ordinary telephone lines to a teletypewriter terminal, operates so fast that it appears to be servicing all users in the same split-second.

NO MIDDLE MAN

GE time-sharing service enables people with little, if any, previous data processing experience to use modern, high-speed computer systems for immediate solutions to their problems. Until the development of this GE-pioneered technique, businessmen, engineers, and scientists were generally problem specifiers who had to work through a programmer or computer experts.

The programmer would then prepare the problem for the computer and schedule it for its turn on a batch processing system which solved one problem at a time.

Time-sharing, in effect, provides people with the use of their own "personal computer" for immediate solutions to problems.

PROGRAM LIBRARY

A major feature of GE time-sharing service is a vast library of powerful, work-saving programs stored in remote GE computer systems for use by all subscribers. Programs are retrieved by name and the user supplies his own data, variables, or information requested to solve the problem.

A user of the service can also write and store in the system programs specifically for his own applications. These programs are stored under the user's own identification number and are not available to other subscribers of the service.

NUMERICAL CONTROL PROGRAMMING

The first of a new series of library programs specifically developed for numerical control programming are now available with the service to prepare EIA coded tapes at the teletypewriter terminal. Three programs, specifically designed for the preparation of control tapes for most two- and three-axes point-to-point machine tools, have been added to the library.

NC PROGRAMS DESCRIPTION

- . NCPTS is used to describe the geometry of the piece to be machined in terms of points, lines, and circles in reference to a common coordinate system. The computer does the geometry calculations in seconds and sets up a list of X-Y coordinate pairs which is stored in the system as a Point Coordinate File.
- . NCPPP is used to prepare the actual control tape format for a specific machine tool and numerical control combination. The format is based on data stored in the Point Coordinate File, instructions which direct the tool through the machining operation, and a description of the machine tool.
- . NCEIA converts the control tape format into EIA code and directs the punching of a master control tape at the teletypewriter terminal.

CONTOURING CAPABILITY

The GE service can be used to prepare tapes for contouring operations on many two axis machines. Most firms are not taking advantage of this capability in their tools because manual programming is too complex. The service capability will be expanded with additional library programs now being developed for contouring, milling machines, and lathes.

HOURS OF OPERATION

GE time-sharing service is guaranteed available nationwide from 8 a.m. to midnight, five days a week. Moreover, in most areas the service is available around-the-clock , throughout the week.

AVAILABILITY OF SERVICE

GE time-sharing service with numerical control programming capabilities is now locally available in 61 metropolitan areas in 28 states and the District of Columbia.

In the following metropolitan telephone dialing areas, customers can dial a local telephone number and connect with a distant GE computer system without incurring long distance charges.

Akron, Ohio	Oklahoma City, Okla.
Albuquerque, N.M.	Orange County, Calif.
Atlanta, Ga.	Orlando, Fla.
Baltimore, Md.	Palo Alto, Calif.
Boston, Mass. (Metro area)	Pensacola, Fla.
Bridgeport, Conn.	Philadelphia, Pa.
Buffalo, N.Y.	Phoenix, Ariz.
Chicago, Ill. (Metro area)	Pittsburgh, Pa.
Cincinnati, Ohio	Portland, Oregon
Cleveland, Ohio	Princeton, N.J.
College Station, Pa.	Providence, R.I.
Colorado Springs, Colo.	Richmond, Va.
Columbus, Ohio	Rochester, N.Y.
Dallas, Texas	Sacramento, Calif.
Dayton, Ohio	Salt Lake City, Utah
Denver, Colo.	San Diego, Calif.
Detroit, Mich.	San Francisco, Calif.
Fort Worth, Texas	Santa Barbara, Calif.
Harrisburg, Pa.	Schenectady, N.Y.
Hartford, Conn.	Seattle, Wash.
Highland Park, N.J.	St. Louis, Mo.
Houston, Texas	Stamford, Conn.
Huntsville, Ala.	Syosset, Long Island
Indianapolis, Ind.	Syracuse, N.Y.
Los Angeles (Metro area)	Teaneck, N.J.
Milwaukee, Wis.	Toledo, Ohio
Mineola, N.Y.	Tulsa, Okla.
Nashua, N.H.	Washington, D.C. (Metro area)
New Haven, Conn.	Worcester, Mass.
New Orleans, La.	Youngstown, Ohio
New York City (Metro area)	

TYPICAL APPLICATION AREAS

- . Numerical Control Programming
- . Engineering Design and Calculations
- . Business Forecasting
- . Quality Control and Manufacturing Planning
- . Education -- classroom instruction and problem solving

COST OF STANDARD SERVICE

General -- Present user fees are \$10 per hour of terminal time and 4¢ per second of computer time. (Minimum monthly charge is \$100). Teletypewriter rental from the local phone company can range from \$80 to \$150 per month, depending on model and accessories, and is an additional charge which is billed by the phone company. Customers calling the local service number from an outside dialing area incur telephone line charges based on the distance from the local service area.

Example -- If a customer used 25 terminal hours in a month, he would probably experience 37.5 minutes of computer time based on an average user experience ratio of 40 to 1. Therefore, based on the above fee schedule, the cost of the 25 hours of terminal time would be \$250 (25 x \$10) and the computer time would be \$90 (37.5 min. = 2250 sec. x 4¢ per second).

Storage -- Cost for storage space is \$2.50 per program storage unit (1,536 characters) per month.

LANGUAGES AVAILABLE

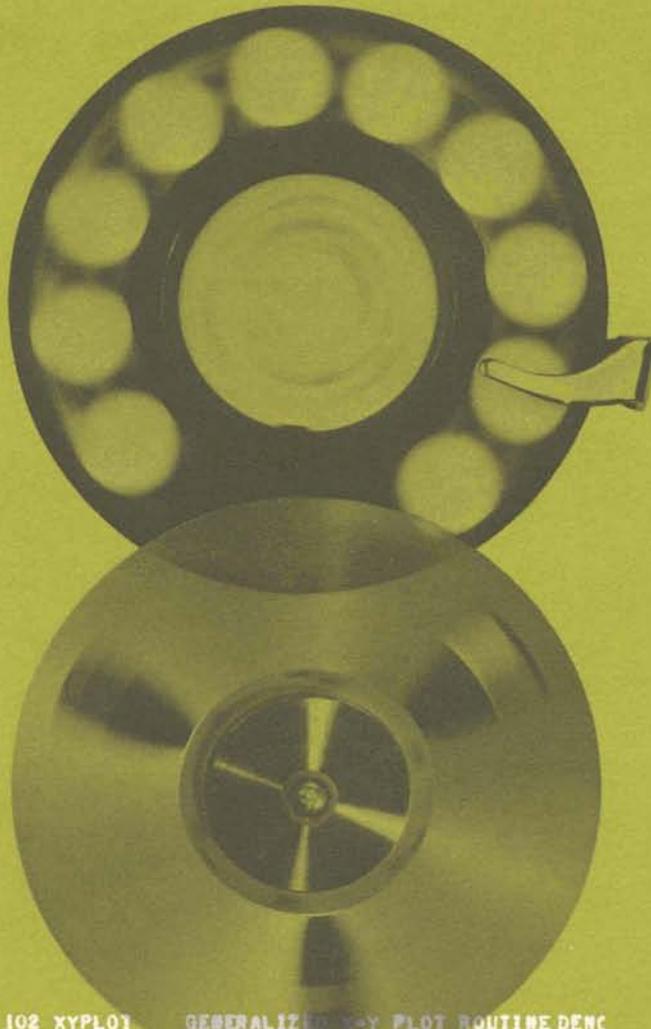
Languages used with the GE service are BASIC*, time-sharing FORTRAN, and ALGOL.

TERMINAL FACILITIES

GE's time-sharing service accommodates Model 33 and 35 teletypewriters and CalComp 500 series plotters.

* Developed by Dartmouth College

Dial GE for "Instant Computing"



102 XYPL01	GENERALIZED X-Y PLOT ROUTINE DENC
104 BENDS	STEEL BEAM SELECTION FOR VARIOUS
106 LPPILT	DESIGN OF N-DERIVED LOW-PASS FIL
108 ENGEPA	ENGR. E.P.A. PREPARATION. 'LIST'
110 LINREG	LINEAR REGRESSION CURRENT OPERATI
112 LSTGR	LEAST SQ. POLYNOMIAL CURVE FIT.
114 INTEGR	NUMERICAL INTEGRATION GENERAL USE
116 POLYMO	POLYNOMIAL EVALUATOR DESCRIPTION
118 ROOTXY	* FINDS ROOTS, MAX'S, AND MIN'S OF
120 COMPLX	FINDS REAL AND COMPLEX ROOTS OF
122 LINPRG	LINEAR PROGRAMMING-LIST LPRULE P
124 LPALGL	*ALGOL VERSION OF LINPRG INDEX TO
126 CPNONE	CREATES INPUT FOR "CPNTWO". LIST
128 CPNTWO	* CPM PROGRAM. LI
130 CALPLO	CALCULATES AND
132 DESTAT	DESCRIPTIVE STA
134 SIXCUR	LINEAR REGRESS
136 MULREG	MULTIPLE RE
138 MULTRY	MULT. P
140 TWOWAY	



Information Systems

Time-Sharing Service

Instant Computing—Economical, Simple, Flexible

Instant computing is a new way of using a computer. You simply dial G.E. right from your own desk and you immediately have a full-sized, modern General Electric computer at your disposal.

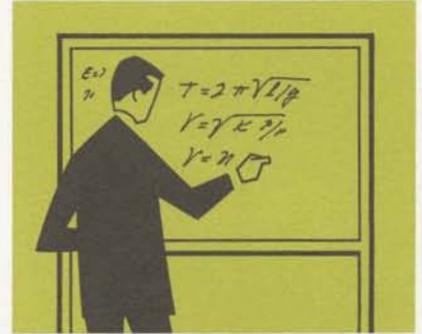
This means that you have a computer available when you really need it. You pay only a fraction of its total cost for its use.

The result is that a large, modern computer now can be economically practical regardless of the size of your organization. Yet it can be available instantly, just as though you were the sole owner and operator.

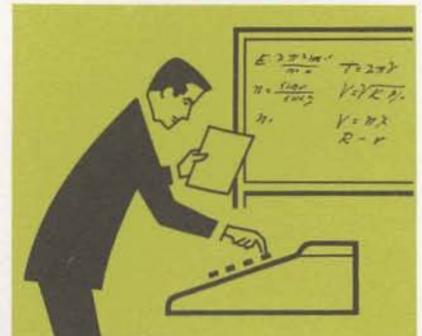
Why Use Instant Computing?

In today's business environment, your time is of utmost value. Instant Computing permits you to conserve time and use it more efficiently. If you have not used computers in the past, you know how many hours you have spent on manual calculations. And even if you have used a computer, you probably had to wait a day or more for answers to your problem. You programmed your problem (usually needing help from a trained programmer) and had it key-punched. Then you took the deck of punched cards to the computer room where your program was scheduled to run along with others. Finally, the program was processed through the computer and returned to you with the finished computations. Your program may have been correct the first time. More often than not, changes had to be made, and the deck had to be taken back to the computer and run again. This entire process probably took at least 24 hours. Instant computing, or "time sharing" as it is often called, has eliminated these delays. Now you can check out your program and put it to work for you within seconds.

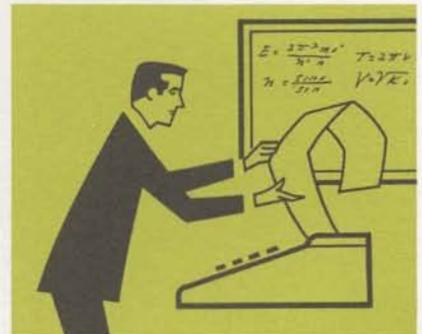
Problem definition



Computer calculation



Immediate solutions



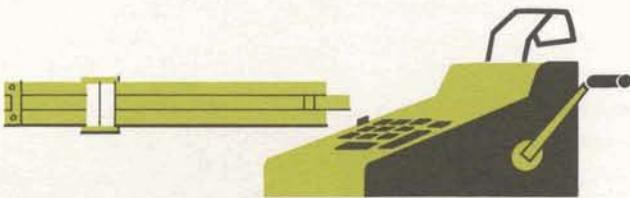
Data utilization



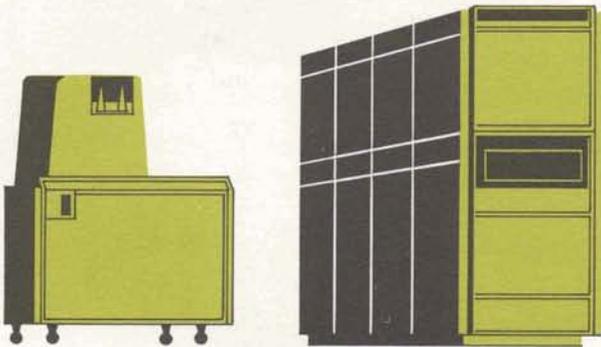
How Can Time-Sharing Service Be Used?



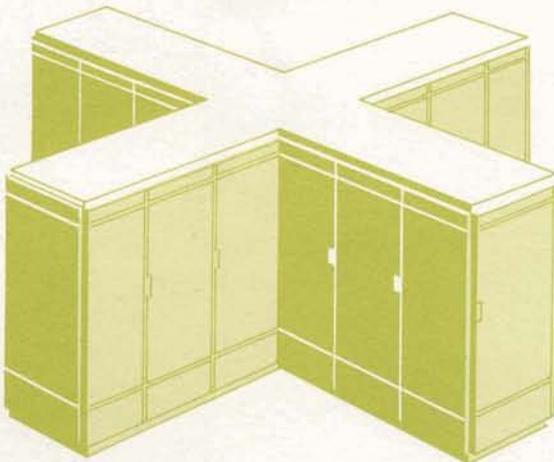
Pencil and paper



Slide rule, calculator



Small computer



Large computer

You can handle many types of applications with Time-Sharing Service—mathematical calculations and computations, statistical analysis, central file interrogation, educational techniques, business modeling—to name but a few. The most suitable jobs are those too large and time-consuming to be done manually and too small to justify the exclusive application of a large computer system.

Time sharing most efficiently solves problems now done with these computational tools.

General Electric Time-Sharing Service Can Save You Time and Money

Time sharing means cost sharing. The computer's capacity to serve many users simultaneously means that when you share the time on the system you only have to pay for a share of the total cost. The result is that a powerful General Electric computer is now economically practical for even the smallest businessman.

EXCLUSIVE CONTROL

Although you share the computer with others, you have the feeling that you are the only user. The high speed of the computer enables it to keep busy most of the time. While you are thinking about your next instruction, or while your output is printing, another user's program is being instantly processed.

Many computations are of short duration and require only intermittent access to the computer. You can type in a problem, get the answer and, if necessary, try it again with different conditions or data without ever getting any indication that the computer is doing anything else.

PROGRAM RETENTION

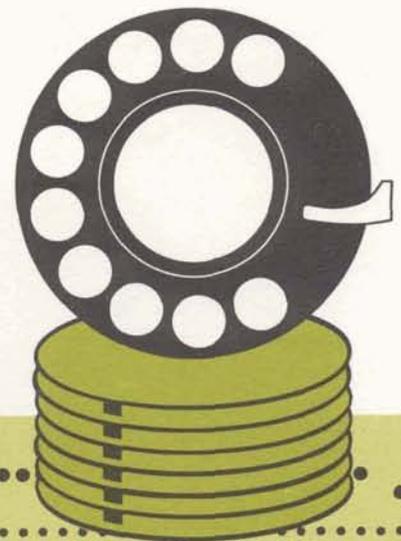
As a subscriber to General Electric's Time-Sharing Service, you have the advantage of storing programs in the system for future use. You need not worry about the other programs in the system. You are assured of program storage protection. Your programs are known only to you, and can be used only by you.

FLEXIBILITY OF LANGUAGE

You can communicate with the computer in simple English and abbreviations that are easy to learn. You are not restricted by a long list of burdensome conventions. After a few hours of orientation, you can create and run your own programs. If you are a more experienced computer user, of course, you can use more advanced languages to gain even greater flexibility.

TRIAL AND ERROR

You may operate the system at your own speed. You can correct your own mistakes and learn to compute at your own pace. This "conversational mode" of computing is ideally suited to a trial-and-error approach. You are under absolutely no pressure from others to complete your processing by a certain time. The computer is yours for as long as you need it.



Instant Computing Is Easy to Use

As a subscriber to the General Electric Time-Sharing Service, you install the keyboard terminal in the most convenient location at your place of business. This terminal can be connected to the computer system through the public telephone network.

To activate the system, you dial the computer just as you would dial any phone call. The computer answers with a confirmation tone. In response to a short series of questions from the computer, you identify yourself, indicate the name of the programming language you intend to use, and provide the name of the program. If it is one you have previously stored away, it is retrieved. If not, you start anew. When the computer is set to work on your program, it types "READY." You can then write a new program, or just run an existing program. The computer solves your problem *immediately* and prints out the answer at your terminal. The response time is a matter of seconds.

With time sharing, you and the computer form a team, each cooperating with the other to provide a rapid and easy means of computation. You provide the judgment and step-by-step guidance. The computer provides rapid and accurate calculations. This means that you can use simpler methods and shorter, easier programs than you did previously.

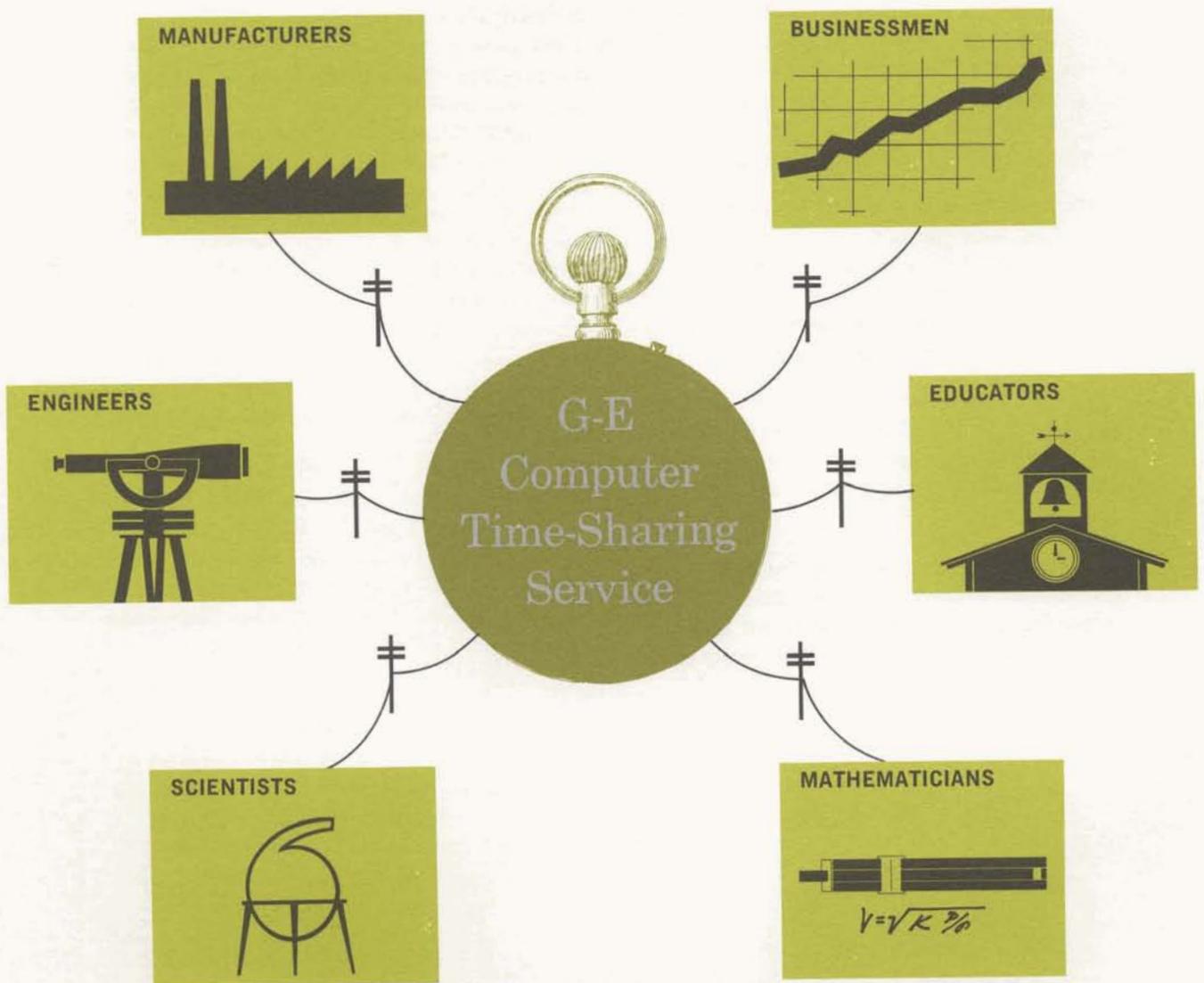
You receive a complete set of manuals that describe the Time-Sharing Service and explain the languages used to communicate with the central computer. In addition, as improvements are incorporated into the system, you receive bulletins explaining the new features.

You also have access to many valuable programs stored in an on-line System Library. You can obtain a listing of these programs, select the one you need, call it out and use it. In addition, you can exchange programs with other users of the system if you both desire.

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102 XYPLOT GENERALIZED X-Y PLOT ROUTINE DEMO
104 BEMDES STEEL BEAM SELECTION FOR VARIOUS
106 LPFILT DESIGN OF M-DERIVED LOW-PASS FILT
108 ENGEPA ENGR. E.P.A. PREPARATION. "LIST"
110 LINREG LINEAR REGRESSION CURRENT OPERATI
112 LSTSQR LEAST SQ. POLYNOMIAL CURVE FIT.
114 INTEGR NUMERICAL INTEGRATION GENERAL USE
116 POLYNO POLYNOMIAL EVALUATION DESCRIPTION
118 ROOTXY * FINDS ROOTS, MAX'S, AND MIN'S OF
120 COMPLX * FINDS REAL AND COMPLEX ROOTS OF P
122 LINPRG LINEAR PROGRAMMING-LIST LPHULE FC
124 LPALGL *ALGOL VERSION OF LINPRG INDEX TO
126 CPROBE * CREATES INPUT FOR "CPRTWO". LIST
128 CPRTWO * CPM PROGRAM. LIST "CPRTWO". LIST
130 CALPLO * CALCULATES AND/OR PLOTS FUNCTION
132 DESTAT DESCRIPTIVE STATISTICS PROGRAM -
134 SIXCUR LINEAR REGRESSION (SIX CURVE TYPE
136 MULTREG MULTIPLE REGRESSION PROGRAM - LIS
138 MULTRY MULT. REG. WITH VARIABLE ELIMINA
140 TWOWAY 1-WAY OR 2-WAY ANALYSIS OF VARIA
142 PROTRE PROBABILITY TREE CALCULA**
144 SINEGN SIMULTANEOUS LINEAR *
146 TRIANG SOLVES FOR ALL PA*
148 POLFIT LEAST SQUARES *
150 HANDED SAMPLE M*
200 *****
200 CAPABL "CAPABL"
200 EVALUE "EVALUE"
200 *****
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Who Are Some Typical Users of Time-Sharing Service?

General Electric Computer Time-Sharing Service is remarkably versatile. It can be used simultaneously by people of entirely different disciplines and for widely divergent applications.



Some typical applications illustrate the broad capability of Computer Time-Sharing Service

ENGINEERING/SCIENTIFIC

- Design Engineering—*calculate circuit characteristics*
- Mathematical Analysis—*solve up to 24 simultaneous differential equations*
- Statistical Analysis—*perform multiple regressions with up to 10 independent variables*
- Research and Development—*analyze missile trajectories*

MANUFACTURING

- Quality Control—*determine process tolerances*
- Inventory Control—*calculate economic order quantities*
- Materials—*perform ball-bearing selection*
- Production—*prepare make-or-buy analysis*

FINANCIAL

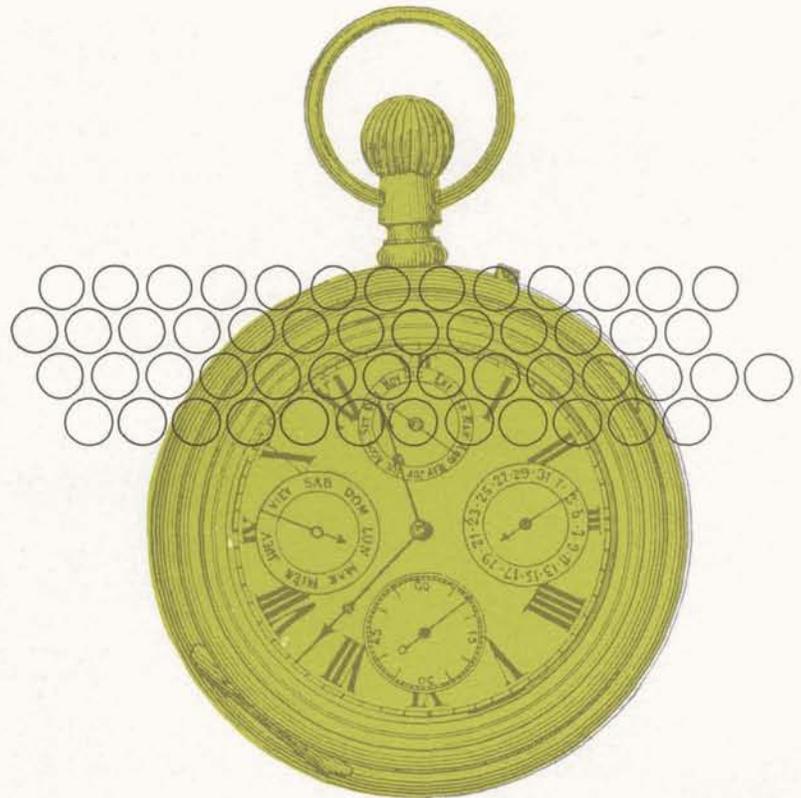
- Banking—*calculate annuities*
- Financial Analysis—*evaluate risk alternatives*
- Cost Accounting—*estimate shop costs*
- Investment Analysis—*prepare portfolio analysis*

OPERATIONS RESEARCH

- Project Planning—*schedule a Critical Path Method network with 200 activities*
- Simulation and Modeling—*operate mathematical models*
- Resource Allocation—*optimize product mixes*
- Forecasting—*calculate sales forecasts*

EDUCATIONAL

- Teaching Computer Technique—*expose students to the computer as a problem-solving tool*
- Programmed Learning—*permit students to progress at maximum rate*
- Problem Formulation—*explore alternative methods*
- Reduction of Trivial Calculations—*solve more complex problems*



WHEN YOU SUBSCRIBE TO GENERAL ELECTRIC'S COMPUTER TIME-SHARING SERVICE, YOU GET THESE ADDITIONAL ADVANTAGES.

- The terminals are easy to install and require little space. They can be placed right at your desk . . . even in your home.
- You don't have to worry about special air-conditioning or environmental considerations.
- There is no increase in personnel requirements; any typist quickly can learn to operate the system.
- You enjoy many continuing improvements in the system without additional investment.
- Time sharing is easily adapted to your current techniques and procedures.

For more information on the benefits of

Instant Computing

*call your nearest
General Electric
Computer Time-sharing Office*

ARIZONA

2725 North Central Avenue
Phoenix, Arizona 85004
Phone: 602 941-4851

CALIFORNIA

2118 Milvia Street
Berkeley, California 94704
Phone: 415 848-8390

121 Puente Avenue
City of Industry, California 91746
Phone: 213 336-7117

4201 Long Beach Blvd., Rm. 410
Long Beach, California 90807
Phone: 213 424-6338

6151 West Century Blvd.
Los Angeles, California 90045
Phone: 213 670-8441, Ext. 201

212 North Vignes St., Rm. 213
Los Angeles, California 90054
Phone: 213 625-7381

361 Lytton Avenue, Suite 106
Palo Alto, California 94301
Phone: 415 328-4151

18040 Sherman Way
Reseda, California 91335
Phone: 213 881-1602

COLORADO

201 University Blvd.
Denver, Colorado 80206
Phone: 303 388-4545

CONNECTICUT

2911 Dixwell Avenue
Hamden, Connecticut 06518
Phone: 203 288-7938

FLORIDA

601 N. Fern Creek Ave., Suite 109
Orlando, Florida 32803
Phone: 305 425-1631

GEORGIA

1485 Northeast Expressway
Atlanta, Georgia 30329
Phone: 404 634-1241

ILLINOIS

110 North Wacker Drive
Chicago, Illinois 60606
Phone: 312 663-3900

MASSACHUSETTS

1 Washington Street
Wellesley, Massachusetts 02081
Phone: 617 237-2050

MICHIGAN

22150 Greenfield Road
Oak Park, Michigan 48237
Phone: 313 398-9000

NEW JERSEY

1490 Queen Anne Road
Teaneck, New Jersey 07666
Phone: 201 833-8300

NEW YORK

570 Lexington Avenue
New York, New York 10022
Phone: 212 751-1311

Northern Concourse Office Bldg.
North Syracuse, New York 13212
Phone: 315 456-3891

60 Washington Avenue
Schenectady, New York 12305
Phone: 518 374-2211, Ext. 53049

175 Jericho Turnpike
Syosset, New York 11791
Phone: 516 921-9521

OHIO

11750 Chesterdale Road
Cincinnati, Ohio 45246
Phone: 513 771-9240

1000 Lakeside Avenue
Cleveland, Ohio 44114
Phone: 216 523-6252

3430 South Dixie Highway
Kettering, Ohio
Phone: 513 298-0311

PENNSYLVANIA

3 Penn Center Plaza, Rm. 1002
Philadelphia, Pennsylvania 19102
Phone: 215 568-1800

1432 Oliver Bldg.
Pittsburgh, Pennsylvania 15222
Phone: 412 281-6400

TEXAS

8100 Carpenter Freeway
Dallas, Texas 75247
Phone: 214 631-0910

3100 Richmond Ave., Rm. 401
Houston, Texas 77006
Phone: 713 529-3128

VIRGINIA

2010 Atherholt Road
Lynchburg, Virginia 24501
Phone: 703 846-7311, Ext. 711

WASHINGTON

5900 Fourth Avenue South
Seattle, Washington 98101
Phone: 206 RO 3-0850

WASHINGTON, D.C.

7800 Wisconsin Avenue
Bethesda, Maryland 20014
Phone: 301 654-9360

CANADA

214 King Street West
Toronto, Ontario
Phone: 416 366-7311

1075 Melville Street
Vancouver, British Columbia
Phone: 614 681-8136

ENGLAND

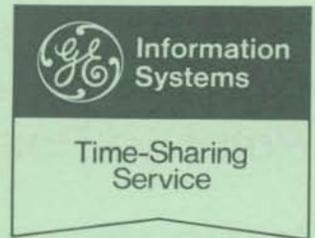
114 Southampton Row
London, W.C. 1

GENERAL  ELECTRIC

Information Service Department

Time-Sharing Service

NC Point-to-Point Processor



Substantial Savings

General Electric's Time-Sharing Service significantly reduces the time it takes to prepare control tapes for two and three axes point-to-point NC machine tools. How?

- Your parts programmer can translate blueprints into control tapes without leaving his convenient time-sharing terminal.
- The quick-response time of the time-sharing system lets him keep going. Costly delays are no longer necessary.
- All of his tedious calculations, sequencing of steps, and formatting are efficiently handled by the time-sharing programs.

Time-Sharing Service truly extends the ability of the parts programmer to create accurate, economical control tapes with a minimum amount of effort. He now can concentrate upon work flow problems, machine utilization, and improved machining techniques.

Ready-to-Use Programs

General Electric's long experience in the field of numerical control, combined with GE's leadership in the technology of time-sharing, have produced a powerful new technique for the parts programmer. The NC programs analyze the geometry of the part being processed, calculate the X-Y coordinates, format this data for a specific machine tool controller, and punch the EIA coded control tape. All of this work is directed by the parts programmer without leaving his convenient time-sharing terminal.

Benefits

Whether you are now using a calculator, an in-house computer, or a batch computing service to do your parts programming, GE Time-Sharing Service has some real benefits for you:

If You Do Not Now Use Computers

Increased Efficiency-The efficiency of your parts programmer is dramatically increased. GE's programs eliminate the need for doing a great number of tedious calculations — either with a desk calculator or look-up tables. The more complex the part, the more the speed and accuracy of time-sharing will benefit you. With time-sharing, your parts programmer's productivity will immensely increase.

Accessibility-Your parts programmer is able to plan his entire sequence of point locations and machine operations, insert his option codes (drill speeds, coolants, etc.) as he thinks through his sequence, review the listing of his formatted tape, easily reorganize or change sequence, and run his final formatted tape.

All without leaving his teletypewriter. By so doing, he can easily establish the most efficient machining sequence and optimize machine usage.

Accuracy-General Electric Time-Sharing Service greatly increases the accuracy of part programming. General Electric's programs give the parts programmer full control over all steps of tape preparation, including analysis of the data, calculation of the coordinates, and formatting of parts programs and tool description files. In addition, the programs provide convenient reference lists as by-products of their work.

Simplicity-The parts programmer is able to describe his NC tool in a vocabulary of his own choosing. He is not tied to any formal programming language. Once his tool description file is set up, he can store it in the time-sharing system and use it each time he needs a new control tape for that particular NC machine tool. The whole technique of preparing NC tapes with General Electric Time-Sharing Service can be used after only a few hours of training.

Versatility-GE's NC programs are versatile enough to handle most point-to-point tools currently in use. These programs also allow better utilization of some 2-axis tools because they easily handle 2-axis contouring work. Many tools have this capability but it is not being used because manual programming is too complex. The parts programmer simply defines more points very close together and does not instruct the tool to be withdrawn during movement of the work table. The programs do the rest.

If You Are Now Using Computers

Fast Turnaround-The quick response of time-sharing helps to meet tight production schedules. No more waiting for days to get a program processed. With Time-Sharing Service a parts programmer can correct and re-run as many times as he needs to — without interruption or delay.

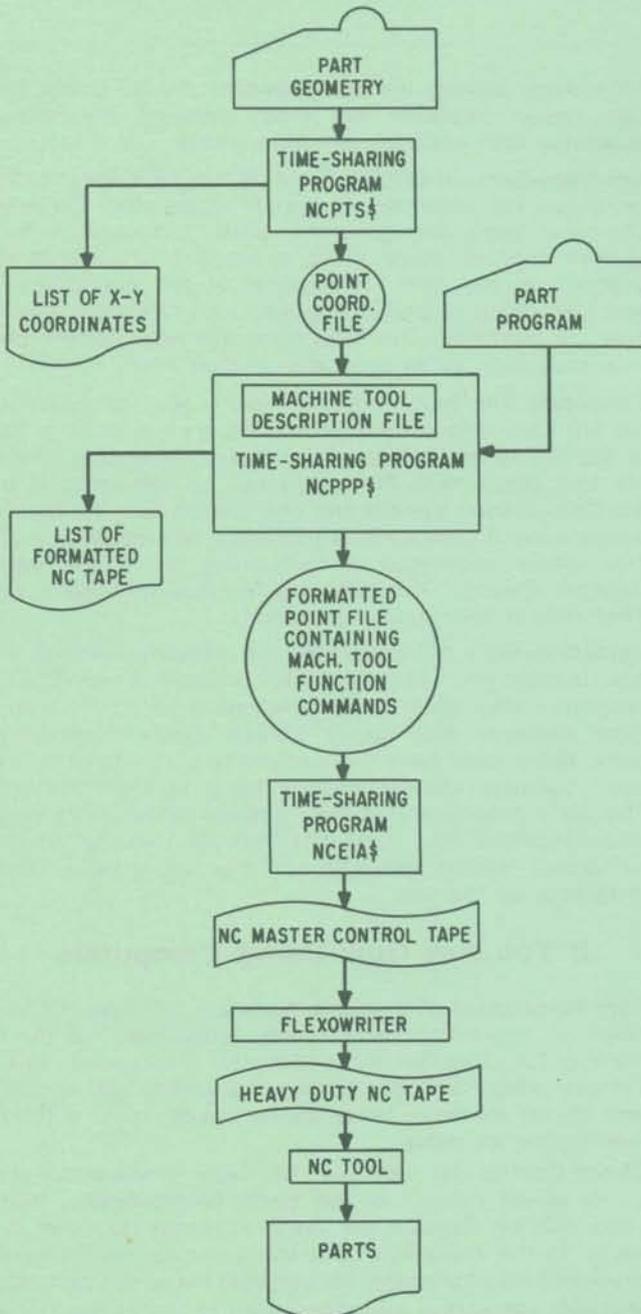
Direct Control-All facets of NC tape preparation are under direct control of the parts programmers. With Time-Sharing Service the parts programmer talks directly to the computer, and the time-sharing terminal produces his paper tape. He controls the whole process.

Machine Utilization-Immediate availability of the tapes permits better use of expensive NC equipment. Machine idle-time is reduced simply because more tapes can now be produced quickly and accurately.

Fast Corrections-Tapes can be corrected quickly if an error is discovered after a tool is "setup" for production. The manufacturing engineer no longer has to either (1) let the tool sit idle, or (2) tear down an expensive setup until a corrected tape is prepared. With Time-Sharing Service he is able to quickly correct his program, re-run his tape, and keep his machine going.

How General Electric's NC Programs Prepare Control Tapes for Two and Three Axes Point-to-Point NC Machine Tools

A parts programmer, using the NC programs in the GE Time-Sharing Service Library, can quickly and easily translate workpiece geometry and machining operations into an EIA-coded control tape. Briefly, the steps are as follows:



The parts programmer describes the geometry of the particular workpiece in terms of points, lines, and circles.

The GE time-sharing program, NCPTS\$, then creates a Point Coordinate File using this information. In addition the program provides a printed list of X-Y coordinates.

Next, the parts programmer enters the set of instructions needed to direct the NC machine tool through the machining operations required to produce the desired part. This set of symbolic instructions is known as a Part Program.

In advance of preparing specific control tapes, the parts programmer uses his remote terminal to set up a Machine Tool Description File. This file is used by the NC Point-to-Point Processor (NCPPT) to tailor its output to the user's specific NC machine tool and controller combination. Once set up, this file is stored and used each time a new control tape is prepared for that particular NC machine tool.

NCPPT translates the Point Coordinate File and the Part Program into the actual control tape format as described in the Machine Tool Description File.

Another GE time-sharing program, NCEIA\$, converts this control tape into EIA code and punches an NC master control tape at the remote terminal.

A heavy-duty tape is reproduced and is then ready for use on the NC tool controller.

More Information

It is easy to see how GE's Time-Sharing Service and the parts programmer interact to form a winning team. Your General Electric Representative will fill you in on the details. He will be happy to give you copies of the Numerical Control Users Guides and demonstrate how GE Time-Sharing Service can be put to work preparing your NC control tapes.

GENERAL  ELECTRIC

INFORMATION SERVICE DEPARTMENT
7735 OLD GEORGETOWN RD.
BETHESDA, MD. 20014

NEWS BUREAU

GENERAL  **ELECTRIC**

68-210-13B

777 14th Street, N.W., Washington, D.C. 20005

Area Code 202—393-3600

J.P. Sweeney

(4-3-68)

From a teletypewriter in their office, numerical control programmers, R. Jackson (left) and J. Putnam, at Numerical Cutting, Inc., a custom sub-contract parts manufacturer in the Buffalo, N.Y., suburb of Elma, use over telephone line, the computational power and speed of a distant General Electric computer system to prepare EIA coded tapes for the firm's N/C machine tools. The new capability of GE's nationwide commercial time-sharing service has enabled the firm to in 1½ hours obtain a tape for the a contouring operation which would require 45 man-hours to prepare using manual methods.



NEWS BUREAU

68-210-13C

GENERAL  ELECTRIC

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J.P. Sweeney

(4-3-68)

The immediate availability of General Electric's nationwide commercial time-sharing service over telephone line from an office teletypewriter enables a numerical control programmer to quickly correct any errors discovered in his EIA coded control tape after the machine tool is set up for production, minimizing machine idle time and the need to tear down an expensive setup.



NEWS BUREAU

GENERAL  ELECTRIC

68-210-13D

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J.P. Sweeney

(4-3-68)

Through teletypewriters in their plants, users of the nation's 14,000 numerically controlled machine tools may call over telephone line on the computational power of a nationwide chain of modern General Electric computers to create accurate, economical EIA coded tapes. This new capability of GE's commercial time-sharing service enables parts programmers to now go directly from engineering drawings to ready-to-run tapes in a few hours or less. Present manual methods can take up to several days.

