

GE Time-Sharing Service

The Field of Numerical Control



STEEL

The Metalworking Management Weekly



AUTOMATION

ENGINEERING



N/C Scene

Purchasing Week

AMERICAN Machinist

IRON AGE

Metalworking News.

GENERAL  ELECTRIC



NC Scene

NUMERICAL CONTROL SOCIETY
44 NASSAU STREET PRINCETON, N.J. 08540

SEQUENCE NO. 37

April, 1968

TIME SHARED COMPUTER SERVICE ANNOUNCED BY GENERAL ELECTRIC

Conference guests had an opportunity to hear the announcement from General Electric concerning the expansion of its commercial time-sharing computer service. The service was said to enable manufacturers to prepare coded tapes for NC machine tools in a fraction of the time required by manual methods.

Speaker E. L. McCleary said that "using the new capabilities of GE time-sharing service, parts programmers or other manufacturing specialists can now go directly from engineering drawings to ready-to-run tapes in a few hours or less." Through teletypewriter terminals in their plants, NC users may "telephone the computer" to create accurate, economical tapes in minimal time.

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PRESSTIME NOTES:

News from ID
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TOOLING & PRODUCTION Magazine

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, and IDA voted to join the U. S. Chamber of
Commerce. The Book of Proceedings on the November 1967 Bat-
telle Conf. is to be available in May.

Computer service for metal working. General Electric Co.
announced recently that it has expanded the capabilities of its
nationwide time-sharing service to accommodate the preparation
of EIA tapes for N/C machine tools. Now, parts programmers can
obtain immediate access to remote GE computer systems over
conventional telephone lines. All that's needed is a teletypewriter in
the user's plant; this enables creation of accurate, economical con-
trol tapes with minimum effort. Mr. E. L. McCleary, marketing
manager of GE's Information Service Department, discussed this
at the annual meeting of the Numerical Control Society.

Fabrication course with laboratory experiments. The Metal
Fabricating Institute, Inc., is sponsoring a five-day educational and
technical institute for leadmen, foremen, methods engineers, super-
intendents, and other management personnel. Rockford College,
June 9-14, 1968.

New technology and a review of basic concepts will
This type of fabricating education is not
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News of the Week

IRON AGE

April 11, 1968 Vol. 201, No. 15

THE 'IN' SIDE OF METALWORKING

Time Shared Is Time Saved

■ Everybody in the computer industry or in an industry that uses computers knows about time sharing—but the proportions of this development are just beginning to be realized. There is hardly a new computer system announced today that does not offer at least a token time-sharing capability.

And most systems go well beyond token capability. General Electric Co. last week made the latest and perhaps the most extensive announcement in this area. GE has expanded their commercial time-sharing service to enable manufacturers to prepare coded tapes for N/C machine tools.

What makes GE's announcement unique is the service, software and general know-how that back up this offer. They have available, proven, field-tested programs for point-to-point machine tools so that a user can go from his engineering drawing to a finished tape in a couple of hours without ever leaving his office and without knowing much about computer programming.

And, according to E. L. McCleary, manager, marketing, Information Service Dept., General Electric, contouring capability will be available before the end of the year. ■

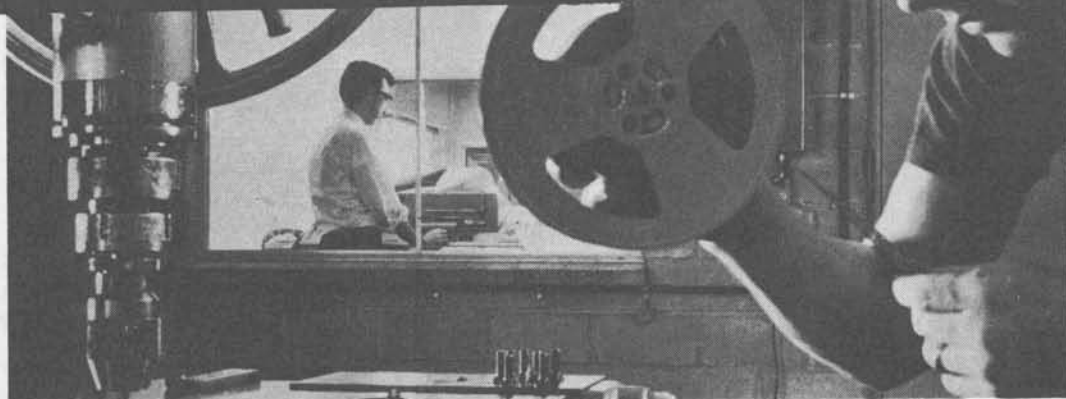
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Purchasing Week

McGraw-Hill's news magazine of Purchasing

April 15, 1968
New York, N.Y., Volume 11, No. 16



Programmers (above) at Numerical Cutting Inc. send data via teletype to GE computer.

Plug in an NC program

Bethesda, Md.: Metalworking companies in 61 cities can now use General Electric's time-sharing computer service [PW, April 8, '68, p.1] to program numerically controlled machine tools faster than ever before.

GE's new hookup enables parts programmers and other specialists to go directly from engineering drawings to ready-to-run tapes in a few hours or less. The process used to take days using manual methods. Numerical Cutting Inc., Buffalo, N.Y., a sub-contract parts manufacturer, is one of 40 initial users. The parts maker can prepare a tape in 1½ hours by computer that required over 45 man-hours by manual methods.

The system eliminates time-consuming manual solving of geometry

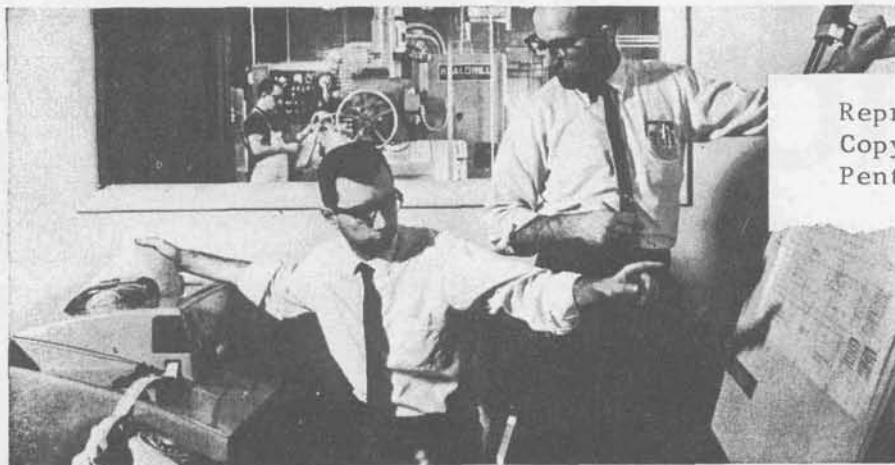
problems. The computer does all the figuring and sends back the results by EIA (Electronic Industry Assn.) coded tapes, which the programmer feeds into the machine tool.

The programmer sends his tool description and problem over ordinary telephone lines on an office teletypewriter. He doesn't need previous computer experience, nor does he have to learn any formal programming languages. Reason: GE's setup employs symbols and English-like words similar to those used in manual programming.

Tools that can be adapted to the system include two-axis or three-axis, point-to-point, numerically controlled machines, automatic drills, milling machines, jig borers or punch presses.

Fees for the time-sharing service are \$10 per connect hour of on-line time and 4¢ per second of computer time used. GE charges \$2.50 per program storage unit (1,536 characters) per month. Teletype service is obtained from the local telephone companies and varies from \$85 to \$150 per month, depending on the equipment ordered.

Numac Corp., Cleveland, says the GE service is cheaper than using its own in-house computer. Reason: The company pays only for the computer time it actually uses.



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Programmers at Numerical Cutting Inc., custom sub-contract parts manufacturer, use remote terminal connected to service center to prepare N/C punched tape.

Time Sharing Service For N/C Tape Preparation

IT SEEMS that many individuals are more than slightly overwhelmed by the physical presence of a computer and the formalized procedures attending its use. These people find it difficult to believe that they are not slaves to a machine. And even when a computer is available, such people will ignore it rather than put up with administrative red-tape and time delays in using it.

Typically, this "who needs it?" attitude can be changed rather easily. The procedure is to provide the skeptic with suitable introductory material, expose him to a keyboard terminal remote from the computer, and allow him some hands-on experience in "conversing" with the computer. The problem-solving nature of man takes over and he soon teaches himself that a computer can be a useful tool. And with confidence established, he learns that he can, indeed, become master of the machine. There is one danger in this technique: the use might appear so simple that the former skeptic begins to see a computer-oriented solution to every problem!

Undoubtedly, this impact on

users is a key element in the explosive growth of computer time-sharing services. And the growth has been explosive. As one example, the Information Service Dept., General Electric Co. reports that there are more than 50,000 users of their Time-Sharing Service. The service is available in 61 metropolitan areas in this country (some are served by long distance telephone contact with a computer center located in another city). Charges for the service are based upon the cost of leasing a Teletype terminal (from \$85 to \$150 per month); \$10 per hour of terminal time; four cents per second of computer time; and \$2.50 per program storage unit. For a typical user the total monthly costs would probably be in the \$300 to \$500 range.

In addition to providing users a way to gradually move into computer use, service centers will undoubtedly have another long-run beneficial effect on the whole computer scene. Because their future depends on serving a wide variety of users in many diverse industries, they must concentrate on improving software.

This type of benefit is exemplified by a new series of library programs for numerical control users that General Electric's Computer Time-Sharing Service has developed. The series includes three programs that enable users to obtain EIA coded punched tapes at their teletypewriter terminals for two- and three-axis point-to-point N/C machine tools.

One program (NCPTS) accepts a description of the workpiece (in terms of points, lines, etc.) and develops a list of X-Y coordinate pairs. A second program (NCPPP) uses these coordinates, instructions about the machining operation, and a description of a machine tool to prepare the actual control tape format. The third program (NCEIA) converts the control tape format into EIA code and directs the punching of a master control tape at the teletypewriter terminal. The programs have been under development and field testing for nearly two years. Additional library programs are being developed for contouring, milling machines, and lathes.

AMERICAN Machinist

April 8, 1968 McGraw-Hill Magazine of Metalworking Manufacturing

Trends



Tooling

Time-sharing computer for NC tape

General Electric is offering a time-sharing computer service for preparing point-to-point NC tapes via a data link hook-up. The system makes available to you the calculating features of a general-purpose computer as well as storage facility and computing time for a post processor (or as many post processors as you want to commit to storage).

Here's how it works. The programmer, using a time-sharing terminal, describes the geometry of the particular workpiece in terms of points, lines, and circles. He uses a vocabulary of his own choosing rather than any formal programming language. NCPTS\$, the GE time-sharing program, now creates a Point Coordinate File from this information and provides the programmer with a hard copy in the form of an X-Y coordinate print-out list.

Next the programmer enters a set of instructions needed to direct the NC machine tool through the machining operations required to produce the part. This set of symbolic instructions is known as a Part Program. Using a Machine Tool Description File (post processor) previously committed to storage, the computer now employs its NC Point-to-Point Processor (NCPPT\$) program to translate the Point Coordinate File and the Part Program into actual control tape format.

In the final step, another GE time-sharing program (NCEIA\$) converts this control tape to EIA code and punches an NC master control tape at the remote time-sharing terminal.

Advantages of the system—computer assisted part programming.

