THE GENERAL AUTOMATION 18/30 COMPUTER SYSTEM

GA 18/30

A TIME PROVEN FIELD PROVEN WORKHORSE

In over 400 installations throughout the world, the General Automation 18/30 has proven its value as a dependable, economical, and efficient computational system. It is currently in use in a wide variety of applications in industrial, scientific/engineering, and commercial environments. The 18/30 has also proven itself to be versatile — it can handle a great number of tasks in a single installation, in many types of industries and applications. Its modular design permits it to grow, adding new capabilities as required.

HIGH PERFORMANCE AND LOW COST

Best of all, General Automation has made it possible to offer the high performance 18/30 system at **extremely low cost.** If you're now using a competitive system, or if you're considering adding a computer capability for the first time, you're in for a happy surprise!

For less than you might pay for many competitive computers, the GA 18/30 offers many high performance features including:

- 1.2μsec Memory speed
- DMA — Direct memory interface providing high speed data interchange between external devices and 18/30 main memory
- Three real time clocks
- Powerfail/Auto Restart capability
- Optional floating point hardware
- Up to 61 levels of priority interrupts
- Choice of many high speed, high performance data processing peripherals
- Choice of powerful batch, real-time, or multi-user disk-based operating systems
- Choice of ASSEMBLY LANGUAGE, FORTRAN IV, RPG-II, or COBOL programming languages
- One of the largest applications software libraries in the world

Which all adds up to:

- Reduced data processing costs
- High throughput capacity

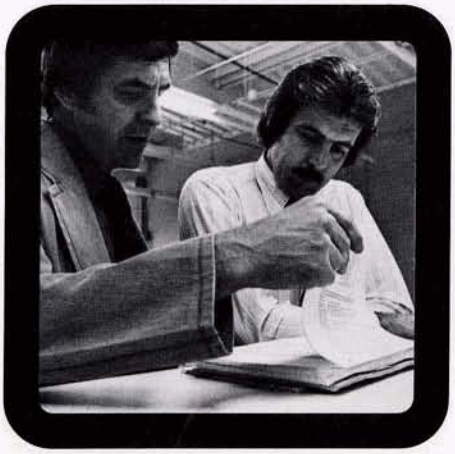
- Easy expansion into new applications through the use of the extensive applications library or one of the three most popular programming languages
- Easy expansion into new operating modes such as real-time, multi-programming or remote job entry to larger IBM, Control Data, or Univac computers through the use of our powerful operating systems and communications hardware
- Wide range of operating systems and applications software means that there is an 18/30 configuration that's exactly suited to your particular application
- Highest reliability

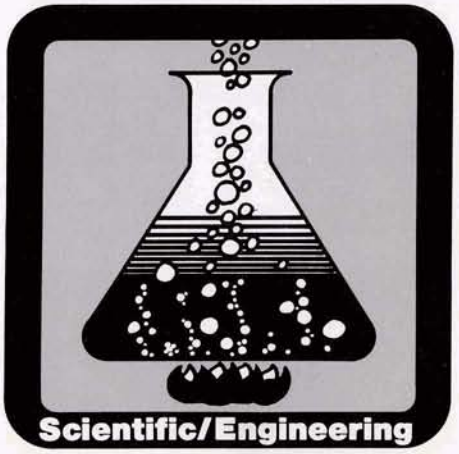
SOFTWARE — THERE'S MORE THAN YOU BARGAINED FOR

There's another important point about the 18/30 that you should know — There's a vast library of software available to you free as an 18/30 user. That's because software which runs on the IBM 1130 will operate on the GA 18/30. So, when you become an 18/30 user you gain access to the software resources of two major computer companies! You can use programs designed to run on the IBM 1130 with little or no conversion, as well as the programs specifically designed to run on the GA 18/30. And that's a lot of software! Probably enough to meet most of your current needs. Even more software is available through the General Automation Users Group Exchange (GAUGE). GAUGE is an active and rapidly growing group of computer users who have moved up to the GA 18/30. The GAUGE software library includes a large number of programs that may be just right for your own use. GAUGE members will help you get even more out of your 18/30 by trading application tips and operating techniques. The GAUGE library is automatically available to you when you become an 18/30 user.

THERE'S ONE THING YOU CAN'T BUY

At GA, there's one thing all of our 18/30 users have that is just not for sale — that's involvement. We just can't put a price tag on the kind of service that has made GA famous. You see, we believe that it's senseless to try and solve your computational problem until we know all the facts about your problem — including your budget. We spend hours listening, probing and learning until we have a handle on your situation. Then, when we begin to tackle your problem, we work in teams. Each project has its own team assigned to it. It's their job to stay totally involved from initial design through finished system. The team members have specialized technical expertise and the experience to know how to put their knowledge to work for you. After the installation, GA won't forget you either. To us post-sale support is just as important as the sale itself. That's why we have a strong network of sales, service, and training offices throughout the world, ready to serve you. And finally, we won't kid you. If we don't feel that we can provide you with the product, the people or any element of the total solution to your problem we'll tell you before you get involved. Even if it means recommending someone else.





MOVE UP WITH THE GA 18/30 THREE WAYS TO GO

You may expand your hardware and move to more powerful operating systems as your requirements increase. The major operating systems available on the General Automation 18/30 include:

- Disk Monitor System (DMS)
- Communications Monitor System (CMS)
- Data Processing System (DPS)

When combined with the flexible 18/30 hardware, one of these three systems can provide a hardware/software solution specifically tailored to your requirements for the same price as "off-the-shelf" systems.

DMS, CMS, and DPS are all disk-based operating systems. That is to say, the operating systems are stored on a high speed magnetic disk, and only the portions required at any given time are brought into core memory. This minimizes the amount of core memory required and helps maximize overall system efficiency.

The 18/30 operating systems provide various combinations of batch processing, real-time processing, and communications handling. Their capabilities are summarized below:

	Batch	Basic Communications	Real Time	Extended Communications
DMS	●	●		
CMS	●	●	●	
DPS	●	●	●	●

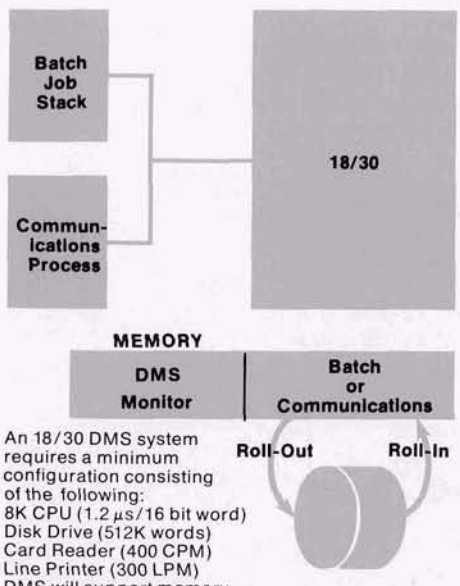
DISK MONITOR SYSTEM (DMS)

DMS is a disk oriented, high throughput system designed for batch and real-time communications processing in commercial, scientific, and engineering environments. System software, user programs, and data are disk-resident to maximize throughput.

DMS features:

- Powerful batch processing facilities
- Real-time communications via "roll-in/roll-out"
- Minimum memory requirements
- Powerful language processors (ASSEMBLY LANGUAGE, FORTRAN, COBOL, RPG II
- Extensive subroutine and utility libraries

DMS processes a stream of batch jobs in the order in which they were entered into the system. The batch job stream will continue to be processed unless interrupted by a communications processing request such as an on-line file inquiry. If interrupted, the batch job will be "rolled-out" and saved on a disk. The real-time job will then be "rolled-in" and executed. Upon completion of the communication job, the batch job will be "rolled-in" and its processing will continue at the point at which it was interrupted. This functional relationship and the associated memory allocation is shown below.

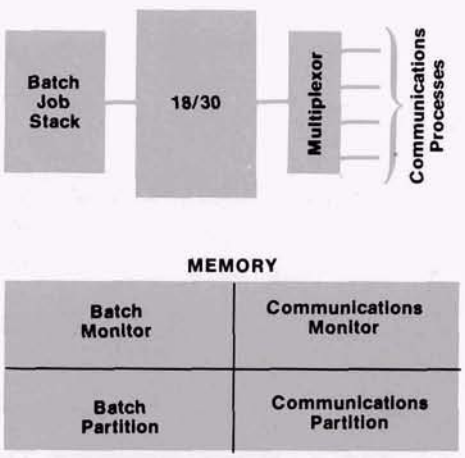


An 18/30 DMS system requires a minimum configuration consisting of the following:
8K CPU (1.2 μs/16 bit word)
Disk Drive (512K words)
Card Reader (400 CPM)
Line Printer (300 LPM)
DMS will support memory sizes ranging from 8K to 32K.

COMMUNICATIONS MONITOR SYSTEM (CMS)

CMS is designed for the user who has a requirement for concurrent foreground/background processing. Typically, a batch job stack would be processed in the background, with peripheral spooling, or an interrupt driven real-time or communications process being executed in the foreground. The batch processing facilities of CMS are essentially those of DMS; however, CMS provides a second partition, thereby permitting both the batch background job and the foreground job to be resident in memory simultaneously. Allowing on-line programs to remain resident in memory vastly improves the response time experienced by the terminal user. Typical applications using the foreground partition would include inventory inquiries, peripheral spooling, or Remote Job Entry (RJE) to a large scale computer system.

As your communications requirements grow (e.g. more inquiry terminals or faster responses are required) a line multiplexor, or even a front-end communications processor such as the General Automation SPC-16 may be added to a CMS system. A representation of a typical CMS 18/30 system, and the associated memory allocation is shown below.



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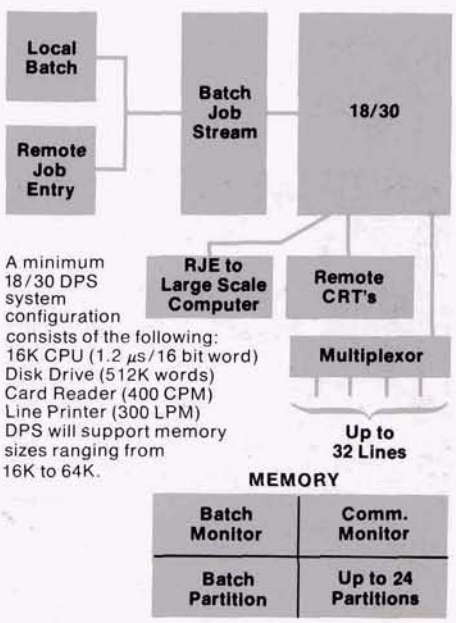
8K CPU (1.2 μs/16 bit word)
Disk Drive (512K words)
Card Reader (400 CPM)
Line Printer (300 LPM)
CMS will support memory sizes ranging from 8K to 32K.

DATA PROCESSING SYSTEM (DPS)

DPS is designed for the user who has a significant batch processing need, as well as a large communications requirement. To satisfy your batch processing need, DPS provides the capabilities of DMS plus a facility for Remote Job Entry (RJE). With RJE, jobs and data may be entered into the batch job stack from a remote terminal. The job will be executed in its assigned sequence and the output will be returned to the terminal.

Large communications requirements may be accommodated because DPS permits up to 24 foreground partitions. This flexibility means that up to 24 communications programs may be simultaneously resident in memory. Thus, rapid response is guaranteed on-line users in a system capable of concurrently handling on-line data entry and inquiry, peripheral spooling, and communications to another large scale data processing system (e.g. 360/370, 1108, 6600 etc.).

In order to efficiently accommodate a system with such diverse and demanding requirements as the one described above, DPS will support a line multiplexor and/or a front-end communications processor such as the General Automation SPC-16. A typical DPS system, and its related memory allocation is presented below.



A minimum 18/30 DPS system configuration consists of the following:
16K CPU (1.2 μs/16 bit word)
Disk Drive (512K words)
Card Reader (400 CPM)
Line Printer (300 LPM)
DPS will support memory sizes ranging from 16K to 64K.

DISK MONITOR SYSTEM (DMS)

DMS is a disk oriented, high throughput system designed for batch and real-time communications processing in commercial, scientific, and engineering environments. System software, user programs, and data are disk-resident to maximize throughput.

DMS features:

- Powerful batch processing facilities
- Real-time communications via "roll-in/roll-out"
- Minimum memory requirements
- Powerful language processors (ASSEMBLY LANGUAGE, FORTRAN, COBOL, RPG II
- Extensive subroutine and utility libraries

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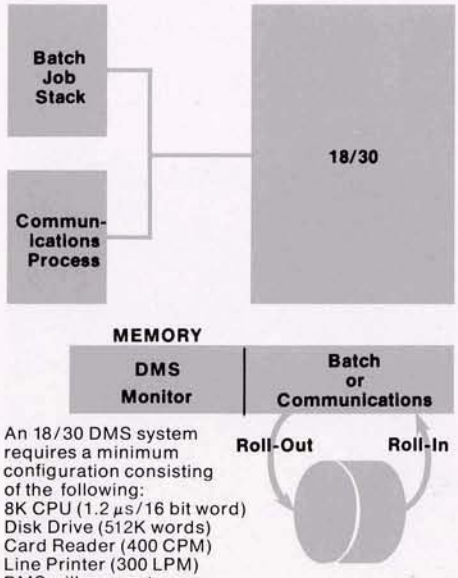

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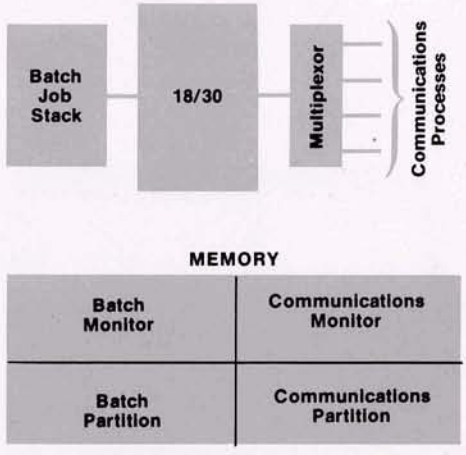

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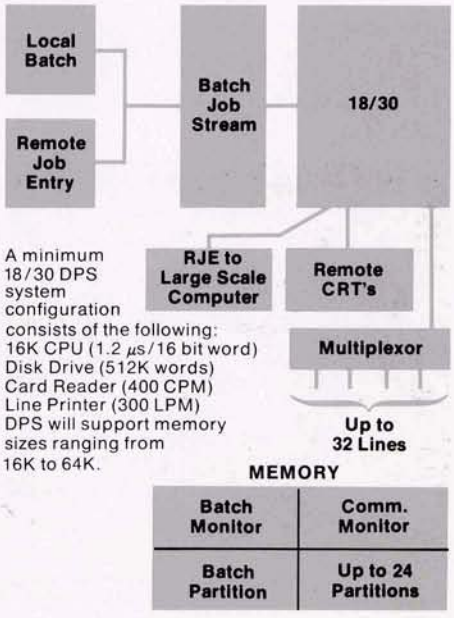

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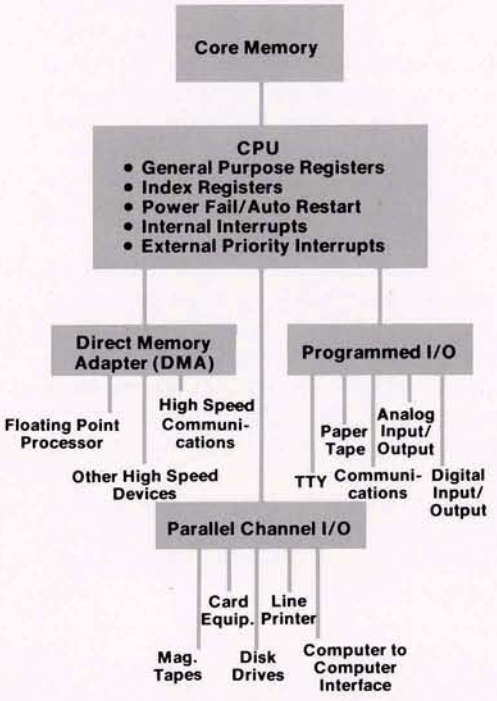
BUILT-IN HARDWARE FLEXIBILITY

18/30 FUNCTIONAL DIAGRAM



CENTRAL PROCESSOR

The heart of the 18/30 system is its fast (1.2 μs/word) and powerful central processor. The 18/30 processor word size is 16 bits plus one parity and one memory protect bit. The processor is available with memory sizes ranging from 8K to 64K. Direct addressing of all 64K is provided. Included in the central processor are sixteen programmable general purpose registers, three index registers, two levels of internal interrupt, and six levels of external priority interrupts optionally expandable to 61.

ARITHMETIC

For arithmetic flexibility, single and double precision integer arithmetic, and hardware multiply/divide are standard, with single precision, extended precision, and double precision hardware floating point arithmetic available as options.

ADDRESSING

For complete addressing flexibility, direct, relative, indexed, and indirect addressing are provided.

INSTRUCTIONS

A complete instruction set with 400 instruction variations is provided on the 18/30. This includes a powerful set of multi-purpose register-to-register commands. The instruction repertoire is compatible with both the IBM 1130 and 1800.

INPUT/OUTPUT PROCESSING

Three modes of input/output processing are provided to maximize 18/30 throughput. Up to five parallel data channels permit high speed block data transfers between the CPU and high speed peripheral devices. A programmable input/output data bus is provided to accommodate single character data transfers. A Direct Memory Adapter (DMA) is available for the connection of high speed external devices.

WIDE RANGE OF HIGH SPEED PERIPHERALS

The GA 18/30 accommodates a wide variety of standard and special-purpose peripherals to meet your specific performance and budget requirements.

DISK DRIVES

There are three models of disk drives available on the 18/30. A basic system uses a disk drive which provides .5 million words of program and data storage. Optionally, disk drives with capacities of 2.5 million, and 10.2 million words of storage are available. In all cases, up to four disk drives may be attached to an 18/30 system, thus providing almost 40 million words of on-line disk storage.

CARD EQUIPMENT

There are four models of card readers, three card punches and one card reader/punch available. Card reading speeds of 200 cpm, 400 cpm, 600 cpm, and 1000 cpm are available. A 100 cpm card punch and dual-purpose 35 cpm and 45 cpm card punch/off-line keypunches are also available. A general purpose card reader/punch which may be used off-line as a key punch with verifying, reproducing, interpreting and interfiling capabilities may be used on an 18/30 system. This card reader/punch reads cards at 200 cpm and punches from 45 to 75 cards per minute.

LINE PRINTERS

Two line printers are available on the 18/30. These include a 300 lpm chain printer and a 600 lpm drum printer.

CONSOLE KEYBOARD

Either a keyboard typewriter or a Cathode Ray Tube (CRT) may be used as an 18/30 console.

MAGNETIC TAPE

Magnetic tape units available on the 18/30 include nine-track units with tape speeds of either 25 IPS, 37.5 IPS, and 75 IPS. An 18/30 system will handle up to eight of whichever model is selected.

COMMUNICATIONS

Extensive communications facilities are available. Asynchronous communications facilities are available to accommodate up to 32 lines, and will support a wide variety of terminal devices. Program controllable synchronous communications facilities will support data transmission rates ranging up to 9,600 baud.

PAPER TAPE

Paper tape equipment associated with the 18/30 system is sophisticated high-speed equipment. Paper tape read speed is 400 CPS and punch speed is 75 CPS. Fanfold and roll tape options are available.

PLOTTING EQUIPMENT

The system is further enhanced by either the small 11-inch drum plotter or the larger 28-inch drum plotter. Both plotters are fully compatible with their IBM counterpart and total software support is provided. In addition, interfaces are available for many of the most popular commercially available plotters.

THE GENERAL AUTOMATION 18/30 COMPUTER SYSTEM

LANGUAGE PROCESSORS & SUBSYSTEMS

THEY'VE GOT LOTS IN COMMON

The use of common language processors and subsystems between operating systems insures that as an 18/30 user you may upgrade from one operating system to another as your requirements change. The programming languages and other subsystems described below are available under DMS, CMS, and DPS!

ASSEMBLER

A high level 2 pass macro assembler which generates machine language instructions from user written symbolic instructions.

FORTRAN IV

A powerful subset of the FORTRAN IV found on much larger and more expensive systems.

RPG II

This popular language is designed for individuals with little or no programming experience.

COBOL

A user-oriented subset of the ANSI version implements table handling, and random access features.

SYSTEM UTILITIES

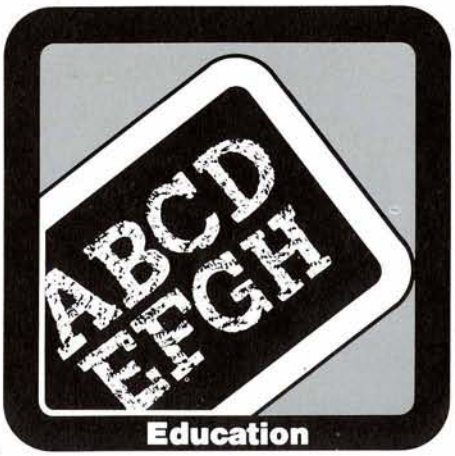
Includes disk file maintenance facility, mathematical subroutines, and a powerful program debugging package.

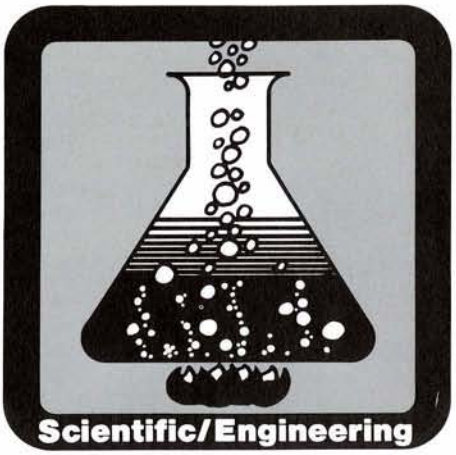
THE SCIENTIFIC, AND COMMERCIAL SUBROUTINE LIBRARIES

Contains approximately 150 subroutines which perform frequently used scientific and commercial functions.

DISK SORT

Only the record keys are physically sorted providing maximum sorting speeds. The file to be sorted may be alphanumeric, and the sorting may utilize multiple keys. This input file may be in either FORTRAN or COBOL format.





APPLICATIONS:

IF YOURS ISN'T THERE, IT COULD BE!
The General Automation 18/30 is designed to efficiently and economically operate in commercial, scientific/engineering, and process control/industrial automation environments. Hundreds of 18/30 systems are in use around the world proving their versatility in diverse application areas such as:

Manufacturing
Process Control, Inventory Control, Automatic Testing, Data Collection, General Accounting, & Numerical Control

Scientific Engineering
Circuit Design and Analysis, Physiological Monitoring, Amino-Acid Analysis, Telemetry Data Acquisition, & Statistical Analysis

Construction
Stress Analysis, Project Accounting, & Job Costing

Finance
Saving and Loan Accounting, Trust Dept. Order Entry, Actuarial Reports, & Payroll

Utilities
Power Distribution, Simulation, Load Flow Analysis, & Utility Billing

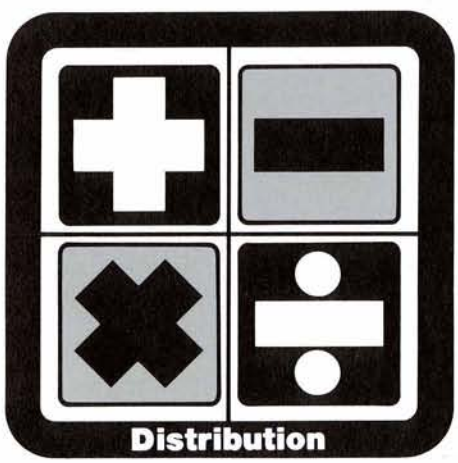
Education
Student Instruction, Laboratory Experiment, Monitoring & Control, Grade Reporting, General School Accounting, & Student Scheduling

Printing & Publishing
Typesetting, Subscription Fulfillment, Photocomposition, & Circulation/ Ad Accounting

Health Care
Hospital Information Systems, Physiological Monitoring, Clinical ECG Analysis, & Laboratory Automation

Distribution
Inventory Control, Order Entry/Invoicing, Sales Analysis, Accounts Receivable, & Accounts Payable

Communications
Store and Forward Message Switching, Communications Processing, Information Storage & Retrieval, Data Concentration, & Remove Job Entry



HOW TO GET STARTED

There's no better time to get started on your automation project than right now! Whether you are upgrading your present system to an 18/30, or you are considering automating your procedures, plant operations, or manufacturing facility for the first time, one thing is certain—that today's economy dictates that efficiencies in productivity must be made to keep pace with rising costs and significant competitive pressures.

Find out more about how the General Automation 18/30 can help you. Contact your local GA sales representative at the address listed on the back cover, or use the attached postage paid business reply mail card. He'll present you with the full story, including costs, and after-the-sale service and support. Or, contact GA in Anaheim at (714) 778-4800. We look forward to working with you!

THE COMPANY BEHIND THE PROMISE

There are lots of companies selling computers, but the list gets pretty small when you need more than just hardware, or when results are what you're really after. We believe that the company that sells you a computer ought to be able to help you use it to the fullest extent. That takes the kind of "extra-step" involvement that only GA gives you.

Every problem we tackle is as special to us as it is to you. That's why each project we undertake has its own team assigned to it. It's their job to stay totally involved from initial design through finished system.

- Every system is fully supported after it's installed. Our strong world-wide network of sales, service, and training offices is there for just one reason—to serve you.

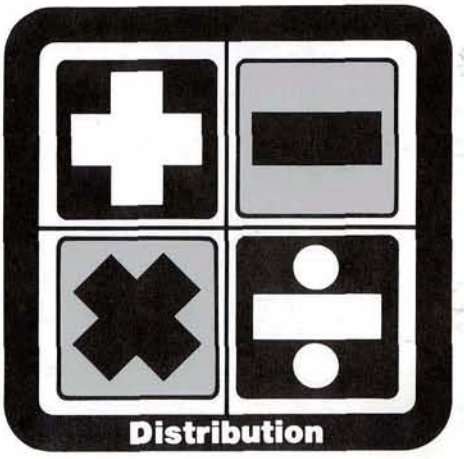
Here are just a few of the ways that GA "after-the-sale" services can help you:

- The General Automation Users Group Exchange (GAUGE) is an organization comprised of General Automation computer system users. Members of this extremely active organization strive to to maximize the value of their computer systems by exchanging software and other valuable information. General Automation actively supports the group by arranging and participating in periodic meetings and providing procedures (such as a monthly newsletter) for the exchange of information between GAUGE members. This rapidly growing organization currently numbers approximately 250 members.
- Field upgrading of your system can be accomplished quickly and easily with minimum interruption of ongoing computerized operations.
- GA 18/30 users are strongly supported by a network of sales and service offices conveniently located throughout the U.S. and Europe. Each office is staffed with knowledgeable and highly experienced representatives. Backed up with the full resources of GA's automation expertise, these representatives not only provide computer-based solutions to your automation project, but see to it that your system keeps on doing the job.
- Customer Training at regularly scheduled intervals in Anaheim, California, or at your facility are arranged at the time of your purchase or as required for new personnel.

HOW TO ORDER

Contact your local GA representative. He'll be glad to assist you in selecting the system that's best suited to your needs. And you can be confident that he won't overload you with unnecessary gear. His success, and ours, depends on solving your processing problems efficiently and economically.

It's easy to contact GA by phone, telex, or in writing. Use the attached postage paid reply card for fast answers to your questions. Or fast action on your request for information on any GA product.



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Florida 32701
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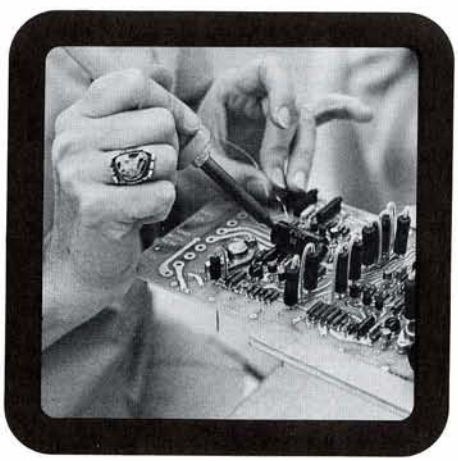

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24320 Indoplex Circle
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(313) 478-2640

University Park Plaza
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