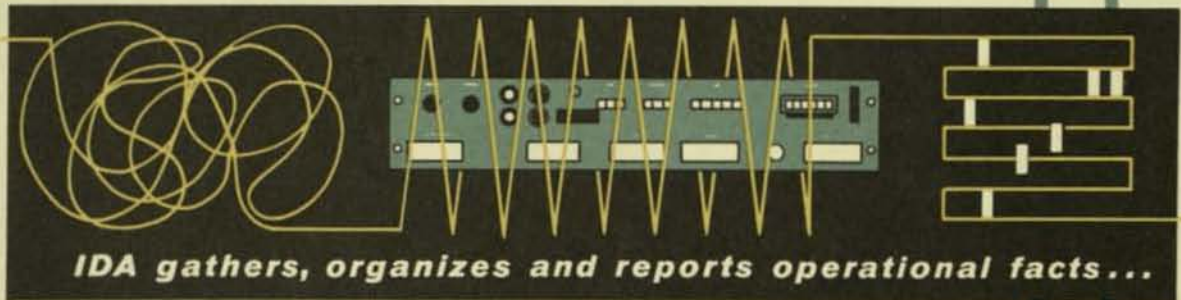


Progress Is Our Most Important Product

GENERAL  ELECTRIC

RANGE DEPARTMENT • APPLIANCE PARK • LOUISVILLE, KY.



IDA gathers, organizes and reports operational facts...

IDA

INDUSTRIAL DATA ACCUMULATOR

RANGE DEPARTMENT
GENERAL  ELECTRIC

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INDUSTRIAL DATA ACCUMULATOR

The photograph on the right shows the control room of IDA—General Electric Range Department's important new way to reduce problems of paper-work and supervisory leg-work.

"PARKING PLACE" FOR OPERATIONAL FACTS

Throughout any day a large manufacturing operation like the Range Department has to keep track of a constantly changing welter of information. Which machines are filling what orders for parts? How many pieces have been produced? What employees are working on which machines? A piece worker changes assignments in the middle of the day . . . that may mean two different pay rates . . . how much does he earn at each? And so forth. Without a complete record of such facts no accurate summary could be made at the end of the day.

As its name suggests, the Industrial Data Accumulator collects such facts automatically . . . "parks" them on its numerous counting indexes. At the press of a button, it instantly records any desired collection of these facts in an IBM card, ready for processing by UNIVAC.

EFFICIENT PAPER-WORKER

Without IDA all such records must be kept by the foreman and other personnel on the job—mostly this distracting paper work is imposed on their supervisory functions. This is slow and costly. "Human errors" can be reduced only to a certain level.

IDA's electro-mechanical operation is so simple, actually, that there is little chance for mistakes. And, as for speed, a full IBM card report is punched for each of eighty machines in a total of less than one minute at the end of the shift!

EXPEDITER

IDA eliminates numerous waits and confusions ordinarily created by paper work. The foreman becomes a full-time supervisor in constant touch with his machines and workers, always available when and where he's needed. The immediate daily reports greatly speed the work of the payroll department. Fast data accumulation keeps the production planning people in close touch with each day's actual production. Thus the Range Department can, for example, cut down on the planned over-runs ordinarily needed as a safety factor.

FAST COMMUNICATION MEANS

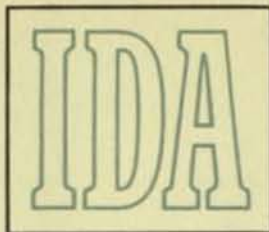
In addition to these record-keeping advantages a many-sided communications system has been built into IDA. Thus workers, foremen, and the control room operator can make constant use of the collected facts—from hour to hour and job to job. Some of the following pages will show the many ways this reduces machine down-time, prevents over-runs, and enables each employee to produce more in his eight hours on the job.



A group of General Electric top managers inspect IDA. Left to right, they are J. H. Goss, Vice President and Group Executive of the Consumer Products Group; C. K. Rieger, Vice President and General Manager of the Major Appliance Division; J. R. Poteat, General Manager of the Range Department; and Ralph J. Cordiner, Chairman of the Board.



HOW



HELPS GENERAL ELECTRIC BUILD BETTER RANGES AT LOWER COST

To the buyer of an electric range, price and value might seem like a simple matter. But to the Range Department, each range is the end result of a complicated effort. Hundreds of people are involved. A little extra efficiency here and there can add up to big savings. It even costs money to keep track of costs!

This is why the steady progress toward fully "integrated data processing" is important to General Electric's customers, as well as to the

company. The faster and more accurately each working group can learn what it needs to supply to or do for the others, the better all can perform . . . the more usable appliance value we can offer for each dollar of price.

As a faster, more accurate way to gather complete facts from the manufacturing floor and send them swiftly, through UNIVAC, to everyone who needs them, IDA takes a major place in the process.



ENGINEERING



MANUFACTURING



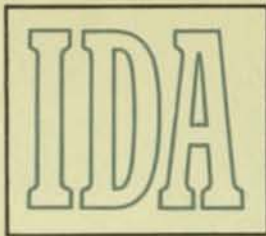
FINANCE



MARKETING



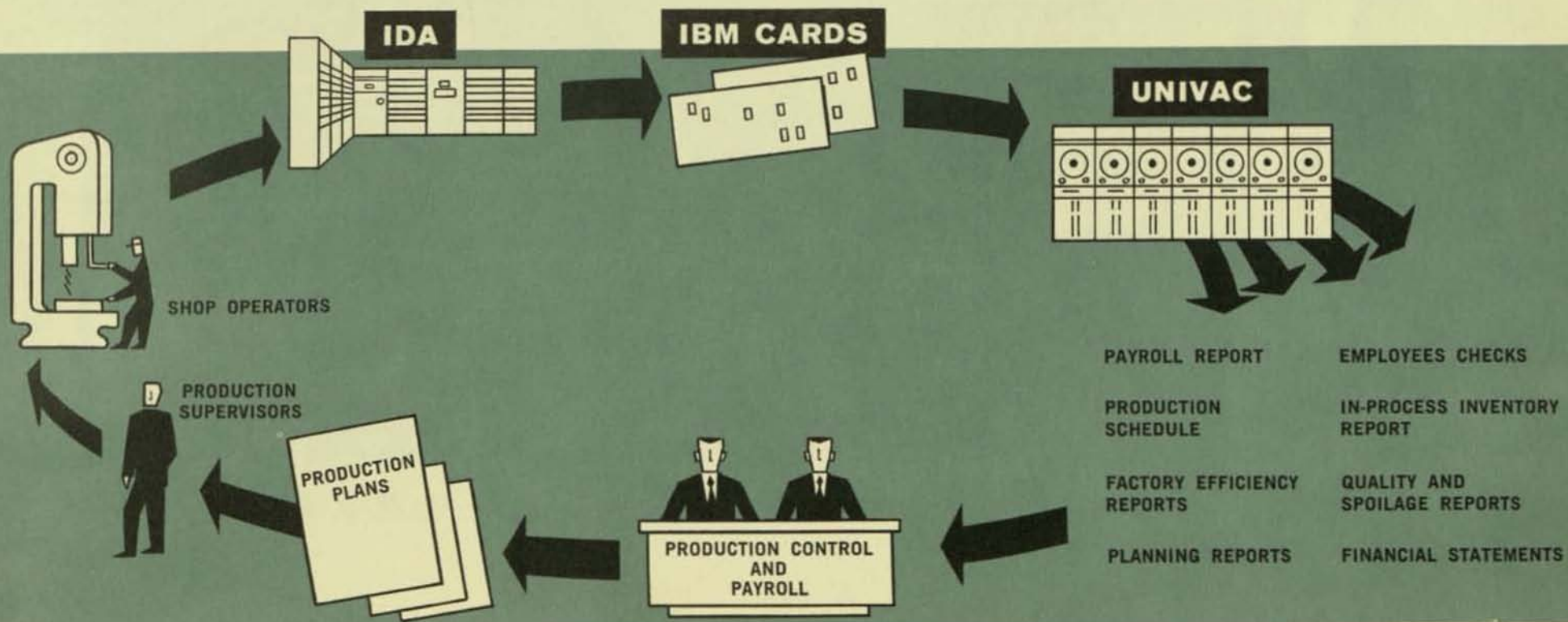
HOW



COMPLETES A "MAGIC OVAL" OF EFFICIENCY FOR THE RANGE DEPARTMENT

The Industrial Data Accumulator bridges the gap between the factory floor and the UNIVAC high-speed computer. IDA collects all fundamental shop facts needed for payroll and production control—a record of work performed by each worker, production time, and downtime. Hours and piece work by each employee are fully identified as to pay rates. The press of a button records all this information on IBM cards. The cards then go to UNIVAC,

the famous computer, which serves five G-E Major Appliance Departments. UNIVAC makes up the payroll, gives back reports and comparisons needed to plan future production and inform management. The speed with which all this information is gathered and interpreted permits the Range Department to relate production to needs with once-un-dreamed-of effectiveness.



SIGNAL BOX AT EACH MACHINE



1. *Box sends an electric impulse to a panel in the control room each time the machine operates. Each impulse turns the counters in the panel, giving production total.*
2. *Red and green lights, at top, tell the machine operator and foreman whether or not the machine should be operated.*
3. *Page switch—the dial at center—permits the employee to send a call for any assistance he needs. It operates the G-E Page-O-Matic, a recorded-voice system that pages the foreman, crane operator, etc. For example, the worker dials for materials, in advance of running out, with minimum interruption of his output.*
4. *Downtime switch in the lower left corner is operated by the foreman, with a key. It turns on red lights at the signal box and the control room panel and starts a count of downtime in the control room.*
5. *Foreman's phone jack, lower right, permits the foreman to talk with the control room operator through a portable telephone. This system enables the foreman to inform the control room on the status of his machines and employees. For example, if a machine is to be down for a good while, the foreman requests a new assignment for the man thus made available.*

CONTROL PANELS

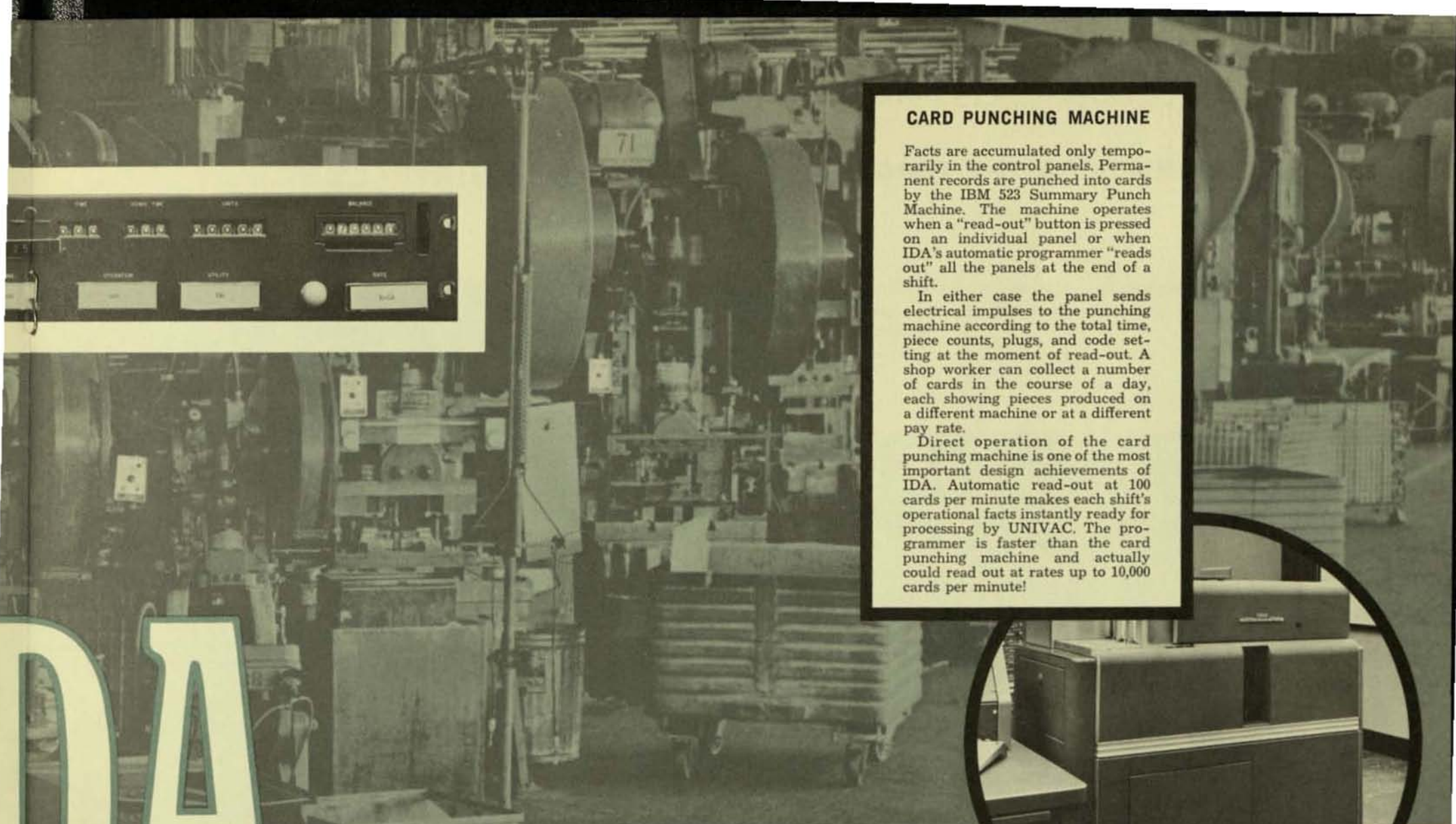
Removable control panels in the control room are the heart of the system. Each panel is electrically connected with one of the signal boxes in the shop. The trunk line is 104-wire "race track" cable, originated to hook up the complicated totalizer of a parimutuel system.

1. *Counters along the top right quarter accumulate counts of operating time, downtime, and units produced. Also, one subtracting counter always shows the number of pieces yet to go on the planned run.*
2. *Identification of the employee and the part he is producing is achieved through the use of rectangular wired plugs along the bottom of the panel. When a man moves from one machine to another, his plug is moved to the panel of the new machine.*
3. *Pay Rate varies with the employee, the operation, and several types of irregular circumstances. The codes for incentive piece workers are set on the two dials at top left, and some special cases are entered by means of a wired plug. Contacts inside each plug can be adjusted to give a variety of number patterns to the card punching machine.*
4. *Lights just left of the counters show whether the machine is operating or on downtime.*
5. *Read Button permits the control man to make an IBM card at any time. This button records all data present in the panel and automatically resets the dials and counters to zero.*



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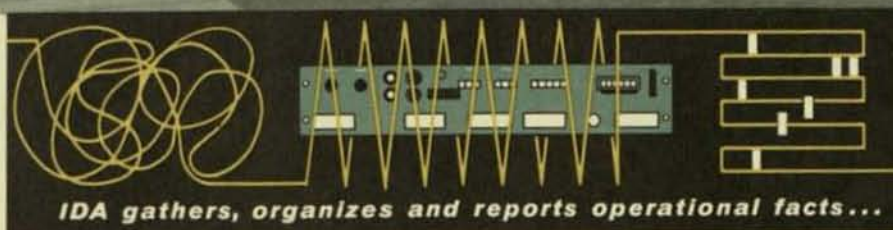
CARD PUNCHING MACHINE

Facts are accumulated only temporarily in the control panels. Permanent records are punched into cards by the IBM 523 Summary Punch Machine. The machine operates when a "read-out" button is pressed on an individual panel or when IDA's automatic programmer "reads out" all the panels at the end of a shift.

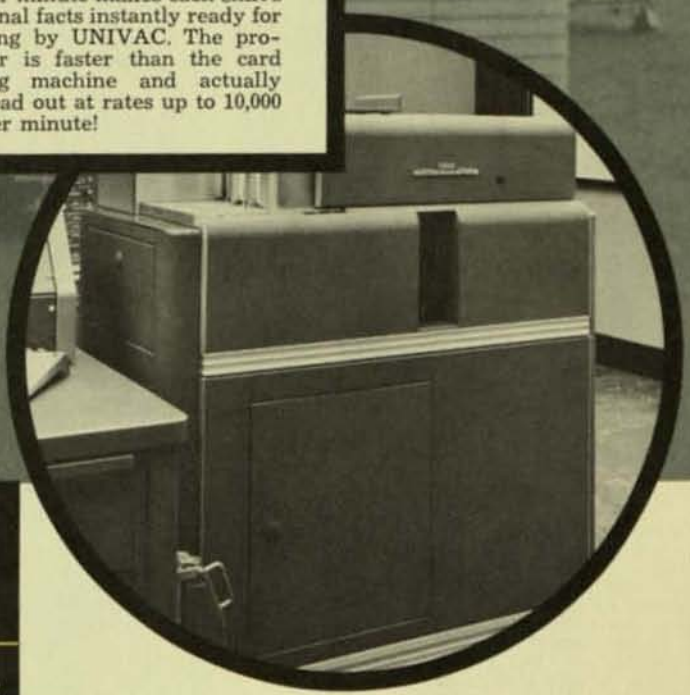
In either case the panel sends electrical impulses to the punching machine according to the total time, piece counts, plugs, and code setting at the moment of read-out. A shop worker can collect a number of cards in the course of a day, each showing pieces produced on a different machine or at a different pay rate.

Direct operation of the card punching machine is one of the most important design achievements of IDA. Automatic read-out at 100 cards per minute makes each shift's operational facts instantly ready for processing by UNIVAC. The programmer is faster than the card punching machine and actually could read out at rates up to 10,000 cards per minute!

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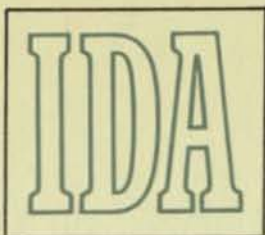


IDA gathers, organizes and reports operational facts...



INDUSTRIAL DATA ACCUMULATOR

COMMUNICATION THROUGH



IDA has two major aspects—it collects and communicates facts for later use, and it helps the men on the job communicate with each other continually. To the regular telephone and intercom systems IDA adds four other means of communication: indicator lights, Page-O-Matic, integral telephone, and the remote writing equipment called Tele-Autograph.



A steady green light on the signal box tells the worker that his panel is turned on—recording time and piece counts. A flashing green light indicates the end of a run—the worker ceases operation and awaits a new assignment. Each worker understands, also, that production counts are not made while his green light is off or the red, downtime, light is on.

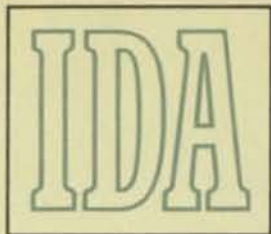
The G-E Page-O-Matic calls specific help to any work station. The system makes each call selection and repeats it in just 23 seconds. If more than one call is dialed at a time, the additional calls are "stacked" and delivered in order.

Through the Tele-Autograph system the tool room gives the control operator remotely written notice when a machine tool is received for revision and again when it is ready for return to a production machine.

The control panel lights work simultaneously with the lights at the signal box, but they have special communications for the control man. A flashing red light means that a worker has turned his Page-O-Matic dial to "Alarm" . . . to say he wants the foreman paged directly. In response to a flashing green light, the control man calls the foreman. Quick reassignment of men and machines now saves hours of production each week.

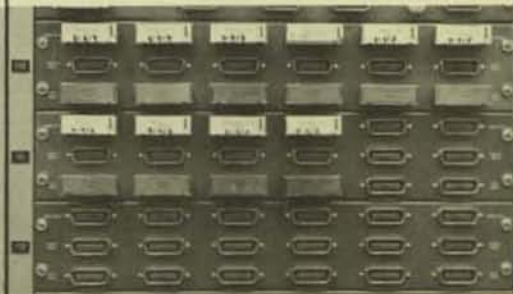
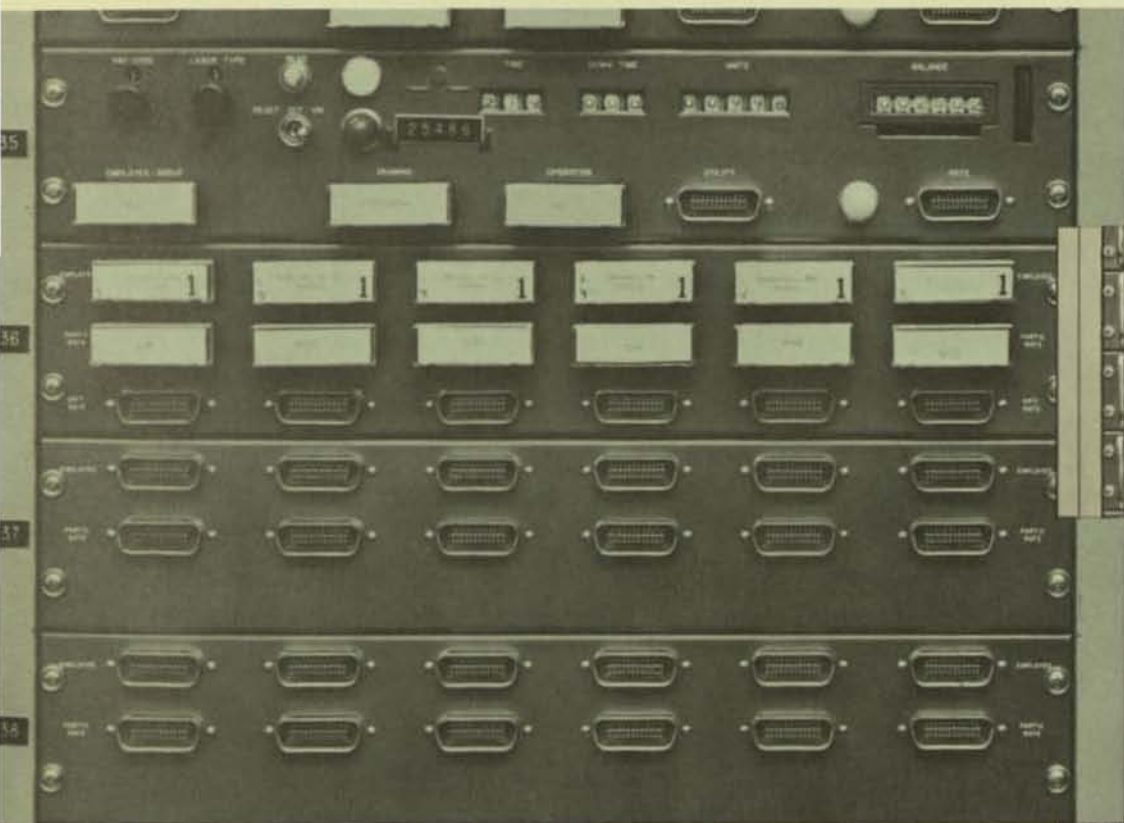
The foreman carries a telephone that plugs into any machine signal box. The foreman shown here might be instructing the control room man to move a worker's identification plug from one machine to another or to switch a pay code setting.

The control operator's end of the IDA telephone system is a loudspeaker and a mike. Most calls from the shop direct him to a particular panel requiring a plug or dial change. Before making the change, he presses the "Read" button to record existing totals in an IBM card.



"THINKS OF EVERYTHING"

The IDA system was expressly designed to leave no loose ends . . . no pencil-and-paper side jobs of fact collecting or recording.



Some machines make more or less than one piece per operation. The impulses from the signal box are relayed through a "ratiometer" panel, like the one shown above. This panel can be set to report up to fifty pieces per operation or down to one piece for every fifty operations. The actual piece count appears on a regular panel.

One regular panel also makes payroll records for all hourly workers in the shop area covered by IDA. Group auxiliary panels placed beneath, hold plugs for the individual workers and their various pay rates.

Here is the provision for keeping track of workers assigned to incentive groups. At the top is a regular piece-work panel. Auxiliary group panels inserted below hold wired plugs identifying the individual workers and their pay rates. Any number of group panels can be connected with one regular panel. The read-out makes a card for each worker.

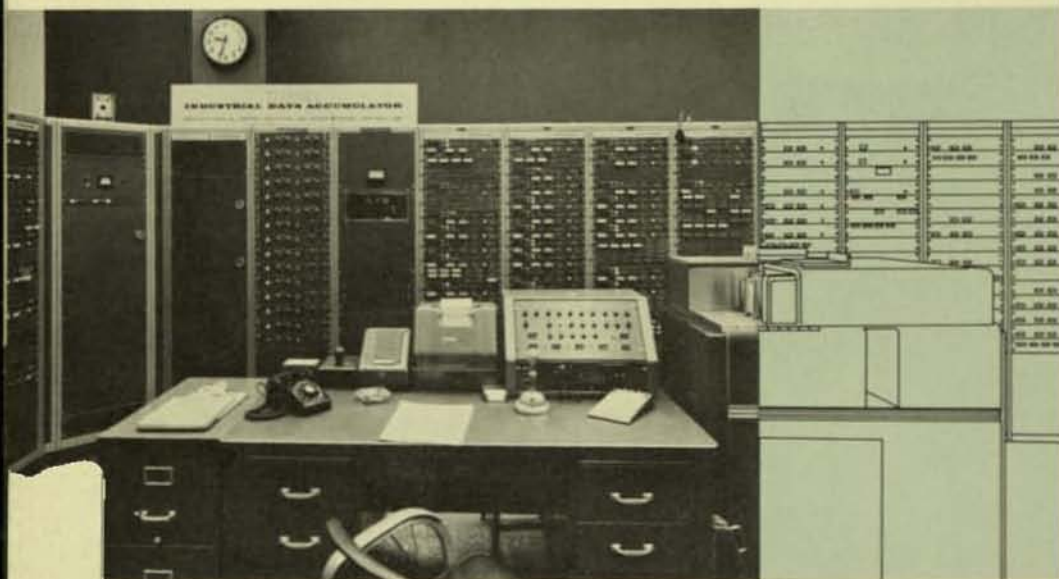


This "manual input box" permits the control man to punch correction cards when necessary. IDA does not make mistakes, but the men who set up the work schedules, shift the people, and put in the variable data are still only human.

WHY

IDA

"GOT THE JOB"



There is only one IDA in existence. Each feature was engineered to meet a specific Range Department need or requirement. Here are some of the design goals achieved in the creation of IDA:

Automatic, fast, accurate data accumulation was the over-all aim. The Range Department feels that IDA contains the right balance of automatic and human controls. Strictly electro-mechanical operation virtually eliminates error from IDA's performance, and the speed of all operations is almost instantaneous.

Simple equipment keeps down maintenance. And, although the whole system is new and unique, each part is a standard item, easy to replace or repair.

Complete production control and payroll data are supplied by IDA. Creating a system that requires no "side" reports was a primary achievement.

Flexible in both scope and function, IDA is an ideal system for the General Electric Range Department, with its rapidly expanding market. The pilot installation covers the eighty work stations of the welding and miscellaneous fabrication areas. By the simple addition of panels and cables, IDA will be expanded to cover the rest of the factory. In addition, present designs allow the inclusion of new and different kinds of information.

The present control room will permit expansion of over one hundred per cent. Through the variable wired plugs, almost any type of new production data can be recorded for a machine or a worker. Any panel can be moved to any cabinet position . . . any machine plugged to any panel.

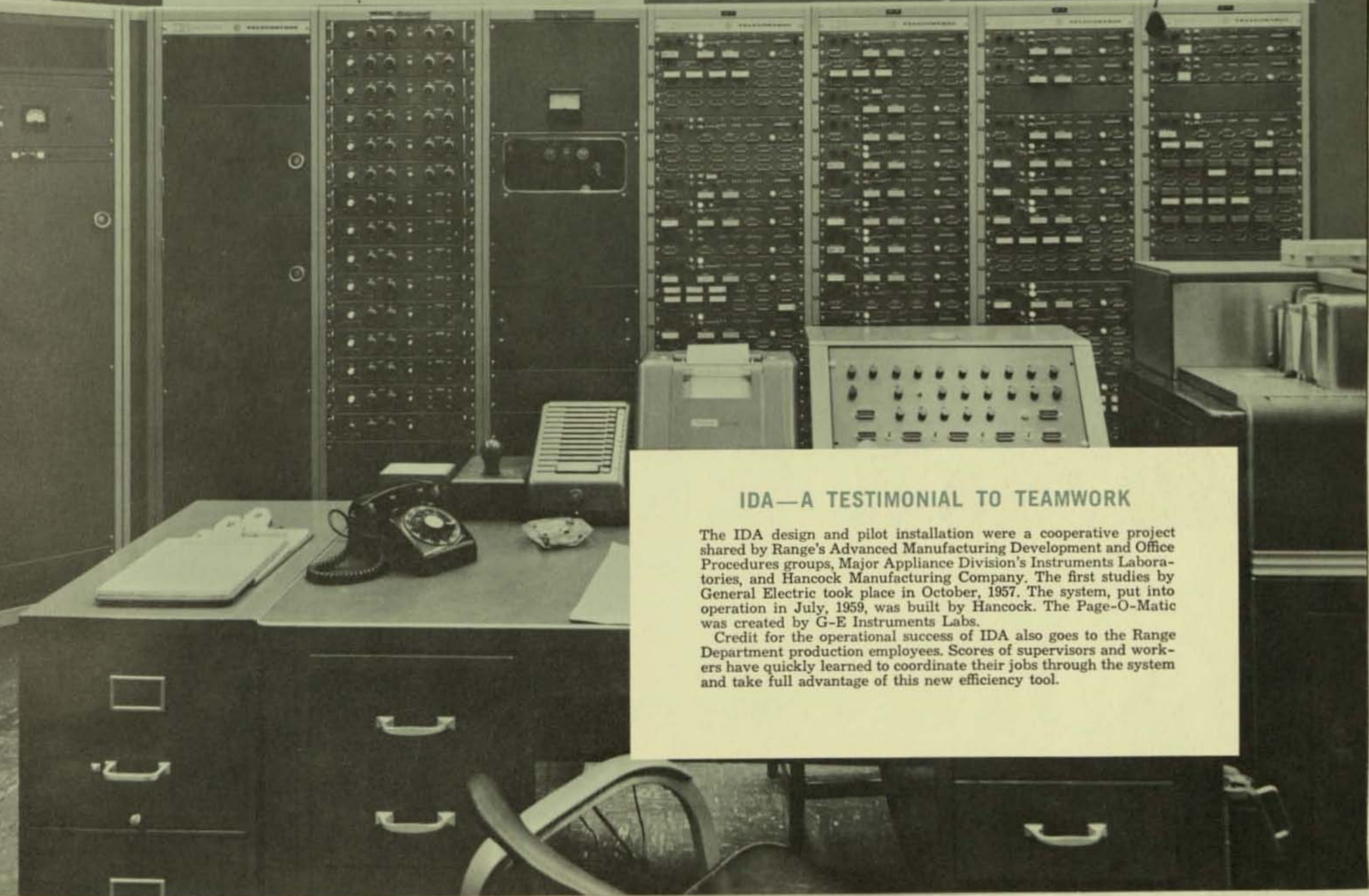
Economical operation and the relative ease of expansion help insure the big initial investment. Extra effort went into giving IDA a "right start," and Range Department is already reaping the benefits. Once the plant-wide installation is finished, IDA will rapidly pay for itself through administrative efficiency and production savings.

Few new additions to the Range Department work team have ever carried greater potential. IDA is a major step toward an over-all integrated data processing program.





IDA
INDUSTRIAL DATA ACCUMULATOR
MANUFACTURED BY HANCOCK INDUSTRIES AND GENERAL ELECTRIC APPLIANCE DIV.



IDA—A TESTIMONIAL TO TEAMWORK

The IDA design and pilot installation were a cooperative project shared by Range's Advanced Manufacturing Development and Office Procedures groups, Major Appliance Division's Instruments Laboratories, and Hancock Manufacturing Company. The first studies by General Electric took place in October, 1957. The system, put into operation in July, 1959, was built by Hancock. The Page-O-Matic was created by G-E Instruments Labs.

Credit for the operational success of IDA also goes to the Range Department production employees. Scores of supervisors and workers have quickly learned to coordinate their jobs through the system and take full advantage of this new efficiency tool.