

Minster Machine Co., Minster, Ohio, has a medium-sized data processing operation. Production reporting through data communications has brought about a significant improvement in casting and weldment output.

Minster Machine employs about 680 people engaged principally in producing metalworking presses in capacities of 16 to 1,000 tons. Several additions to the factory have been necessary during the last decade to meet an increasing demand for its presses, clutches and controls.

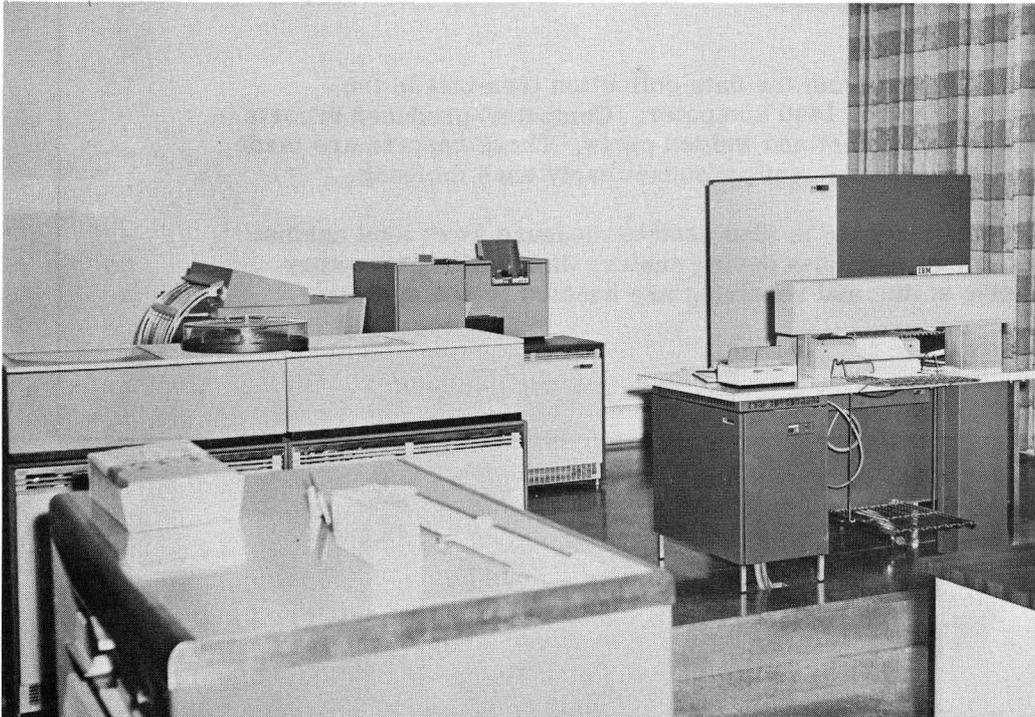
A number of years ago, a punched card system was introduced. This was followed by an IBM 1440 direct access computer with an IBM 1001 data collection terminal installed in the foundry office. A standard telephone line links the collection terminal to the computer center several blocks away.

When the computer became operational, Minster Machine had already acquired EDP experience. Hence, the usual standard accounting and cost requirements soon were being processed efficiently by the computer. In the production area, however, some internal pioneering was necessary.

Minster Machine wanted to test the feasibility of doing production reporting through data collection and transmission directly from the plant floor. The foundry and welding departments loomed as ideal areas for exploring this.

Minster Machine's approach to data collection, coupled with fast and accurate computer processing, was started with the knowledge that it was a problem to obtain accurate information about foundry and welding shop operation.

Foundry and welding department employees are now able to communicate data directly to the computer, then use the timely information it processes as soon as it becomes available, which is almost immediately. This information is accurate because it stems directly from the production floor; no guesswork is involved. Paper orders do not pile up in the office because they no longer exist.



VIEW OF THE
DATA PROCESSING
CENTER AT
MINSTER MACHINE.

Previously, the tendency of foremen has been to choose orders from the stack that would produce maximum tonnage output for any given day. Almost invariably, however, this practice does not achieve the piece production required to maintain schedules of the departments or customers needing the castings or weldments.

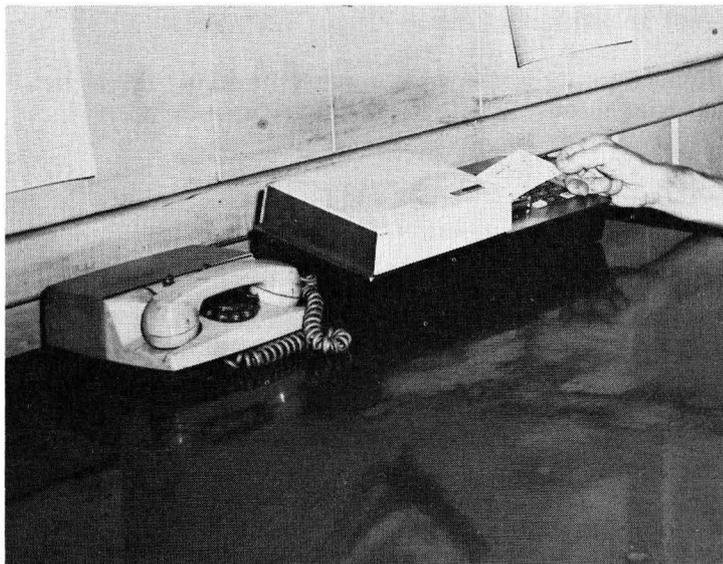
Under the new system, daily output is geared to actual, clearly defined, overall plant production needs, rather than to a constant race simply to produce maximum daily tonnages.

THE SYSTEM

Individual orders to the foundry and/or welding department usually cover one or two castings or weldments. Prepunched cards containing standard order details go to the areas concerned in the various production stages -- pattern-making, coremaking, molding, melting, cleaning -- along with the usual blueprints. Cards for the various areas are identified by color and, for transmission purposes, by a punched code.

With the necessary standard order information already prepunched into the cards, the worker making the piece needs only mark the data and quantity produced on the cards when a job is finished. At the end of each day they are routed to a department clerk.

The next morning card accumulations are inserted, one at a time, into the data collection terminal by the clerk using a keyboard to punch department numbers and quantities into the cards. Both the prepunched standard order and keyed-in information are automatically sent to a card punch machine in the data processing department. This punch automatically produces cards containing information which can be fed into the computer system immediately to update the production records covering the items being reported.



1001 DATA COLLECTION
TERMINAL INSTALLED IN
THE FOUNDRY OFFICE.

An exception report is produced by a printer capable of speeds up to 600 lines per minute as the production file is being brought up to date. The entire process requires only a few minutes and is wholly automatic except for moving the cards from the card punch to the computer system's card read/punch.

Reports are produced for the plant manager, production control people, and the foundry and welding shop foremen, who receive them as soon as they are printed. The reports show which orders are late and the reason why.

The exception report also lists orders produced ahead of schedule, thus providing a complete picture of what is happening. Since the report is on an exception basis, busy production personnel need not wade through a maze of general figures to pinpoint production delays or gains; they are in a position to make needed adjustments quickly.

There are two keys to this production reporting system. One is the data collection terminal. The other is that all necessary production information can be stored randomly in the computer's direct access disc pack files.

One or more disc packs can be used for each processing classification - production reporting, inventory, payroll, cost, and others. The packs can be used interchangeably on disc storage drives, of which there are two. Each disc pack is capable of storing almost three million characters of information. The number of packs that can be employed is unlimited.

The computer produces the exception report by applying the information in the punched cards from the foundry office against the production information constantly stored in a disc pack. File updating is accomplished in a few minutes, with all the necessary shuffling of information taking place automatically within the disc pack file.

Several other reports are produced from the foundry and welding department cards. One important report covers job status and is run daily for production control to use as a reference. Weekly, a due data status listing is produced. It reveals scheduling by individual pieces by due data and is subtotaled by week. The due data refers to a week, not an individual day.

This report helps determine the load and indicates likely areas where subcontracting might be desirable or necessary to meet plant-wide production schedules. In effect, it gives the necessary persons a 20-week look into the future - an ample length of time for problem-solving.

All of this has had a salient effect on the availability of castings and weldments. After six months of system use, Minster Machine has found that if the two departments are not overloaded, a minimum of items come out late.

Computers also are well adapted to inventory management. Minster Machine's stock of 6,000 line items is recorded in disc pack files. The entire list is printed out daily as part of file updating and for reference purposes. Weekly, a similar but more extensive listing is produced to establish requisition requirements. The inventory application will be expanded in the near future when computerized warehouse location and receiving processing is begun. This will reduce the time now consumed in locating parts and components for the production floor.

An even simpler version of the foundry and welding department system has been applied to production status reporting on a work center (or machine group) basis. Again, the direct access disc pack files are used which permit shuffling of pertinent information quickly while still having direct access to the disc pack files for updating. This application does not use data transmission. Minster Machine does not feel it is necessary yet.

The reason is that the plant night shift works until 4:30 a. m. A third-shift information processing staff man reports at 11 p. m. His first duty is to punch any cards needed to complete the updating of all files, then have the computer process them. Shortly after 4:30 a. m. he gets the day's production time tickets and handles them in a similar manner.



IBM 1311 DISK
STORAGE DRIVE AT
MINSTER MACHINE.

Thus, all interested people can have an up-to-the-minute statistical report on the status of production the first thing in the morning.

Finally, a load program provides a detailed weekly listing of total existing work load at each work center as applied against machine load capacity. Again, this provides a medium for looking into the future, determining subcontracting requirements, and generally controlling the situation within a period of 10 to 12 weeks.

RESULTS

Because of step-by-step introduction of data processing, plant workers have been able to absorb the necessary details and better understand the goals Minster Machine is seeking. In each instance they have realized quickly the importance of the completed reports and are aware that the true value of such listings depends largely on the completed production information they provide to the computer.

The area of financial management is one in which significant benefits have been realized. Traditionally, accounting departments have lacked suitable communication with the production areas of industrial plants. Under the new system, the accounting department has ample, computer-accurate information constantly at its finger-tips concerning conditions in the plant.

The system provides accounting with an effective means of telling the production departments (within the context of financial reality) what to do by using the computer as a routine communications tool. This is accomplished largely through the established daily and weekly reports without in any way indicating or even implying that it is dictating the plant's operation from what some might consider an ivory tower of corporate financial interest.

This capability provides an opportunity for management to run the plant efficiently and economically; to plug obvious deficiencies in production performance; and, finally, to subject the plant to a type of expense control that is not only effective but fair and realistic.