INDUSTRIAL DATA PROCESSING APPLICATIONS REPORT

Applications	Data Collection and Customer Billing
Type of Industry	Electric and Gas Power Company
Name of User	Niagara Mohawk Power Corp. Syracuse, N.Y.

Equipment Used	RCA Spectra 70/45 Computer System
	RCA 5820 Videoscan Document Reader
	Moore Interstacker and Detacher

Synopsis

Processing over 1-1/2 million customer bills every month requires a coordinated system to do the job -- and when the preparation of such bills involves customers located in a 24,000 square mile area within New York State, the job is an even more exacting one. Niagara Mohawk Power Corp., Syracuse, N.Y., uses optical scanning to help it in its meter reading and customer billing operations.

BACKGROUND TO EDP

With the steady growth in electric and gas customers over the years, Niagara Mohawk Power Corp. has continually revised its billing system to keep pace with its expanding needs. A computerized system of company-wide billing was developed in 1960. As new and more sophisticated data processing equipment became available, constant improvements have been made, resulting in the company's present optical scanning system.

Niagara Mohawk has updated its data processing billing system with the installation of an RCA Spectra 70 Model 45 computer for preparation of customer bills and an RCA 5280 Videoscan Document Reader for processing customer payments. Optical scanning has not only cut preparation and processing time, but it has resulted in an annual savings of about $75,000 in forms costs alone.

According to Dudley D. Hollister, director of EDP at Niagara Mohawk, "A major factor in the selection of optical scanning equipment was our objective in using the individual meter reader's cards as the source documents for computing customers' bills -- thereby eliminating the necessity of the extra operation of punching tabulating cards from the meter reader's tickets for entry into the computer system."

The Videoscan is an optical scanner that makes use of a 1-in. TV tube to read special printed characters at exceptionally high speeds which can be fed directly into the computer. When Niagara Mohawk installed the Videoscan, the company had to change its former tab card meter reader forms and customer bills to one-part continuous forms made on paper rather than tab card stock. Because the forms were to be scanned optically at extremely high speeds, it was necessary that they be manufactured to close tolerances and that the moisture content of the paper be within limits in order to operate successfully without jamming the highly sensitive optical scanning components.

"Stephen B. Tily, forms system specialist from the Syracuse District Office of Moore Business Forms, Inc., worked with us in the design and technical specifications and construction of the new forms," Hollister relates. "The Research and Engineering Depts. at Moore developed special manufacturing equipment and techniques for producing the required forms."

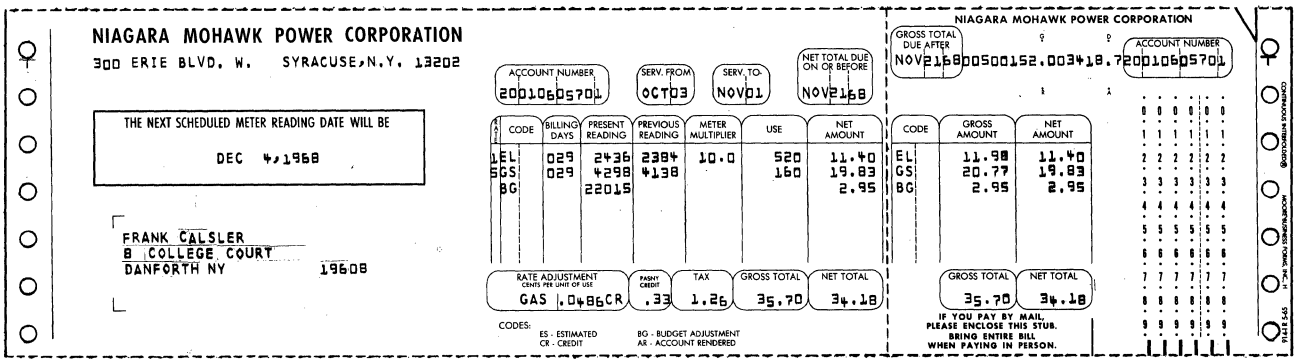
THE SYSTEM

The meter reading forms are the source documents for Niagara Mohawk's automated billing system. They are one-part, continuous, marginal punched forms of selected 20-lb. paper stock, made two-wide and perforated vertically for later separation.

The meter reading forms for all customers are run off on the computer, from master customer meter reading tapes at the central data processing center. The computer prints out the customer's name and address, account number, meter number, previous reading and rate along the top of the form, at a speed of 1,250 lines per minute.

The forms are then run through a Moore Detacher, equipped with an Interstacker, which detaches the individual forms and collates them into proper reading sequence. They are then placed in metal boxes and sent to the various district offices throughout the system where they are distributed to the meter readers who make the readings.

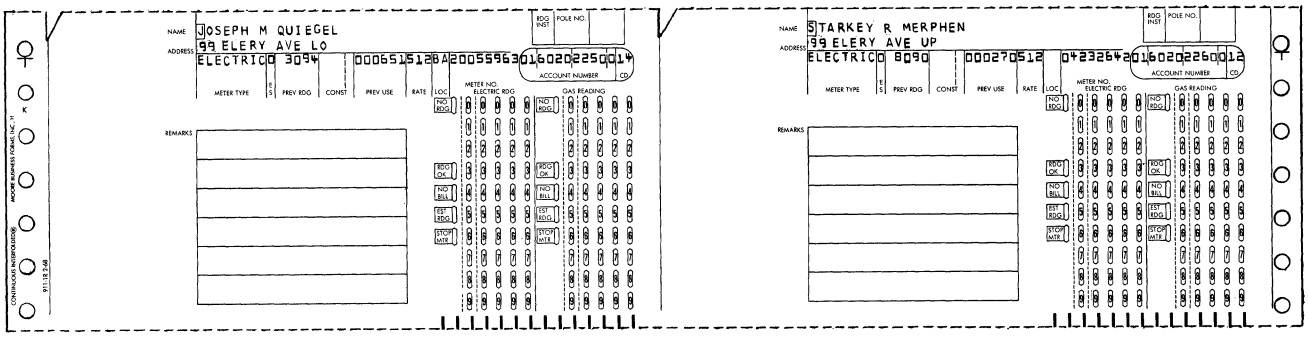
Instead of writing down the reading as with the old method, the meter reader merely marks the figures in the section on the right side of the form (known as the "mark-read" area) to indicate the actual meter reading. All meter reading forms are then sent by the district offices to the central data processing center.



SOURCE DOCUMENT FOR THE BILLING SYSTEM IS THIS TWO-WIDE METER READING FORM. THE PRE-PRINTED FIGURES IN THE "MARK-READ" AREA, AFTER BEING FILLED IN BY THE METER READER, ARE READ BY THE VIDEOSCAN TO PRODUCE A METER READING TAPE.

At the center, the forms are processed through the Videoscan which records the meter readings directly on magnetic tape at a speed of 750 documents per minute. In the event that a form is damaged, or otherwise mutilated making it unreadable, it is automatically rejected by the Videoscan. Tabulating cards are then manually punched for these rejects and entered on magnetic tape. Rejects amount to only about 1 percent of the total meter reading forms processed.

The magnetic tapes from the scanning and keypunch operations are sorted by the computer into account number order and a new Combined Meter Reading Tape is prepared for use in the day's customer billing operation. Approximately 45,000 to 50,000 meter readings are entered into the computer system daily.



CUSTOMER BILL IS THIS ONE-PART CONTINUOUS FORM PRINTED ON SELECTED 20-POUND PAPER STOCK WITH A PERFORATED STUB ON THE RIGHT CONTAINING MARK-READ SPACES FOR RECORDING PARTIAL PAYMENTS.

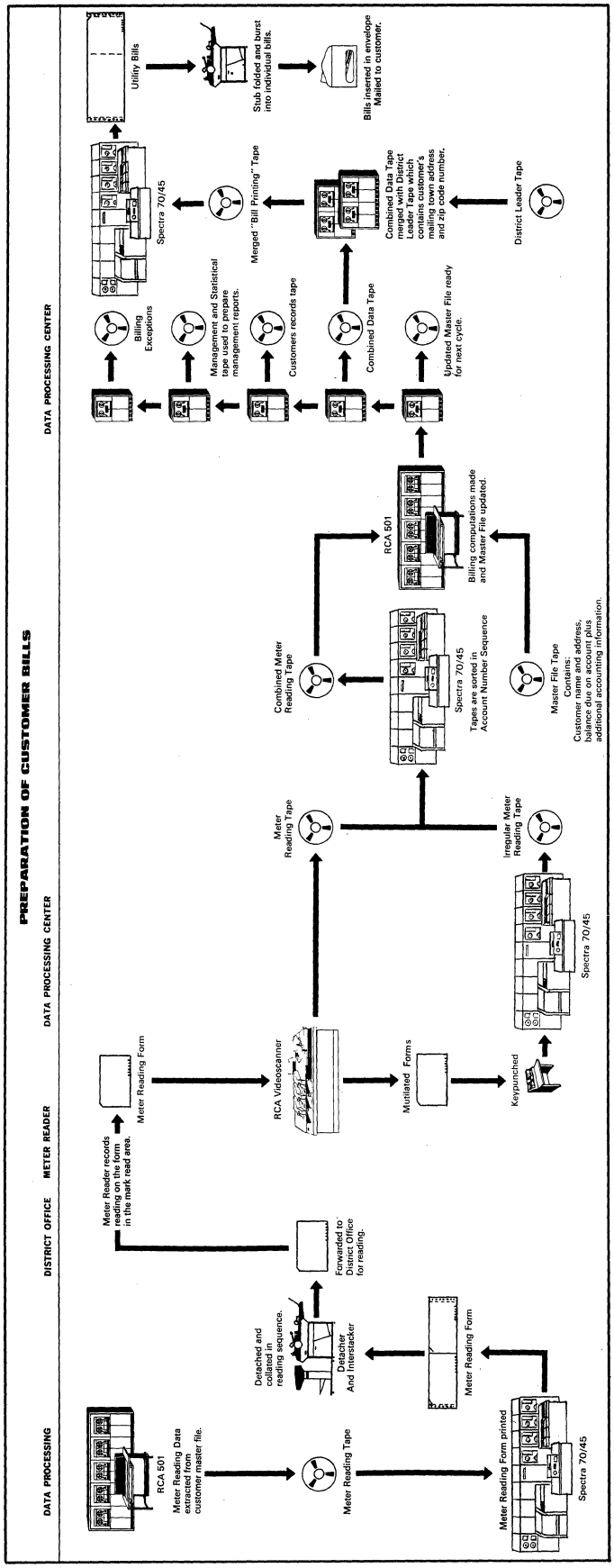


Chart courtesy of Moore Business Forms, Inc.

NIAGARA MOHAWK POWER CORPORATION

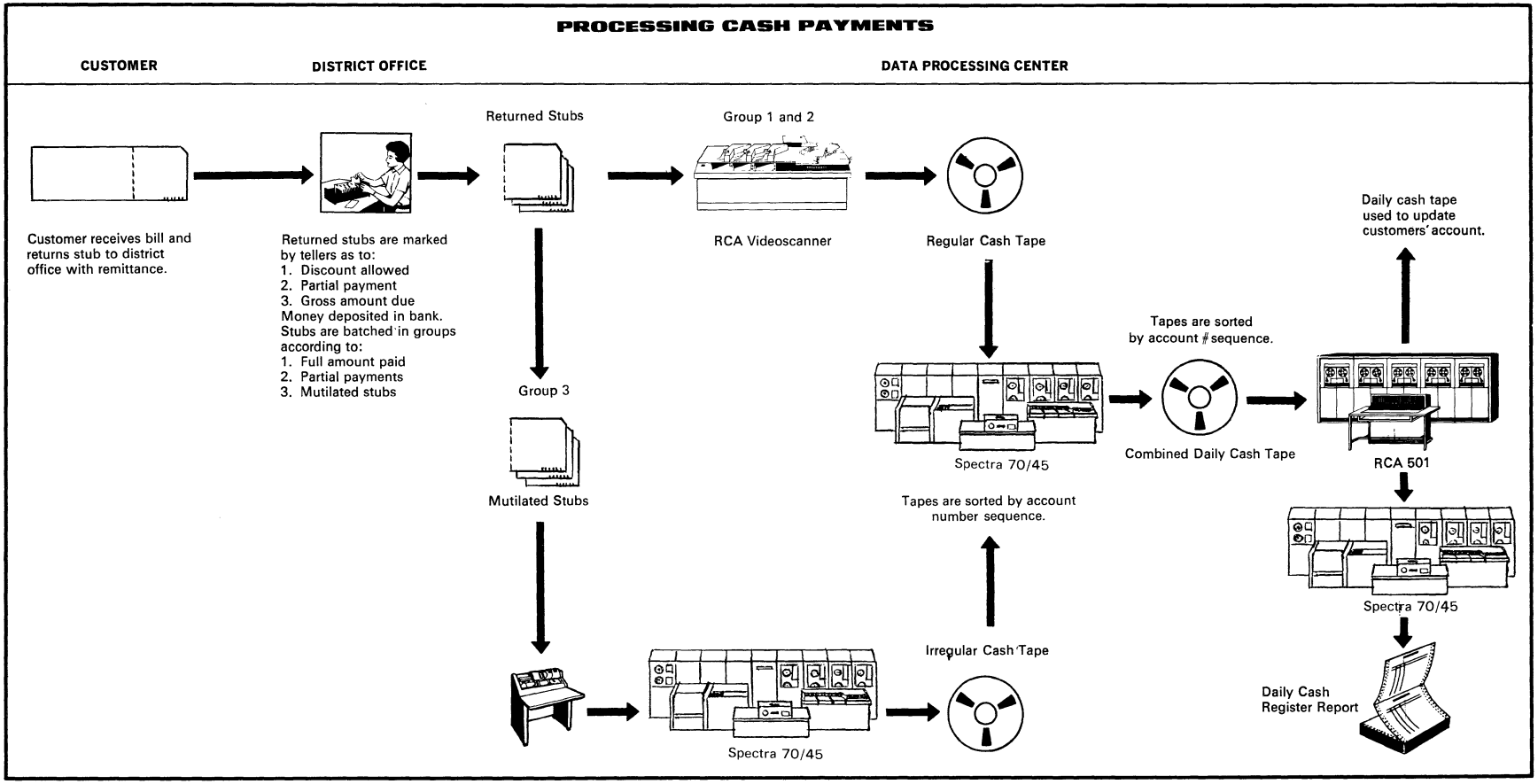


Chart courtesy of Moore Business Forms, Inc.

Customer bills are also one-part continuous marginal punched forms printed on selected 20-lb. paper stock with a perforated stub on the right containing mark-read spaces for recording partial payments received.

To prepare the correct data for printing the customers' bills, the Customer Master File Tape is updated with the Combined Meter Reading Tape. In the billing operation, performed by the computer, five output tapes are prepared: (1) Updated Customer Master File, (2) Billing Exceptions for printing data to be investigated by district office, (3) Customer Records for customer service use by district office, (4) Statistical Data for company reports, and (5) Combined Data Tape for preparation of customer bills.

The Combined Data Tape is then combined with a District Leader Tape (containing the address and telephone number of the district office) creating a Bill Print Tape. This tape is used in printing the customers' bills on the high speed printer.

The bills are then run through a folder-slitter which separates the bills and folds over the right-hand stub portion. An inserting machine then automatically inserts bills, return envelopes and monthly promotional pamphlets, and seals the mailing envelopes, attaches postage and records the quantity. They are then mailed out to customers. The center prepares approximately 45,000 bills daily.

Payments are received in person, or by mail, at the district office in the customers' service area. The right-hand stub portion, which accompanies the payment, is retained as the company's record of payment.

The payment stubs are divided into three groups: (1) regular payments for the full net amount of the bill; (2) regular payments for the full gross amount of the bill or for partially paid bills. The partial payment requires the teller to mark the account received in the mark-read area; and (3) all other payments which cannot be read by the Videoscan, such as manually prepared stubs to replace missing ones, damaged or mutilated stubs, etc.

Payment stubs from all district offices are forwarded to the central data processing center daily. Stubs from group one and group two are processed through the Videoscan and entered on tape at the rate of 750 stubs per minute. Stubs from group three (along with any rejects from the first two groups) are keypunched to tabulating cards from which they are entered on magnetic tape. The two tapes are then sorted into account number sequence and a Combined Daily Cash Tape is prepared. This is used for posting payments to update customers' accounts and also in preparing a Daily Cash Receipts Register.

RESULTS AND FUTURE PLANS

"The use of optical scanning in our meter reading and customer billing operations," says Hollister, "has provided a number of benefits. Chief among these are increased speed, accuracy and greater flexibility. We are continually reviewing our operations in an effort to develop additional ways to make maximum use of our data processing facilities."