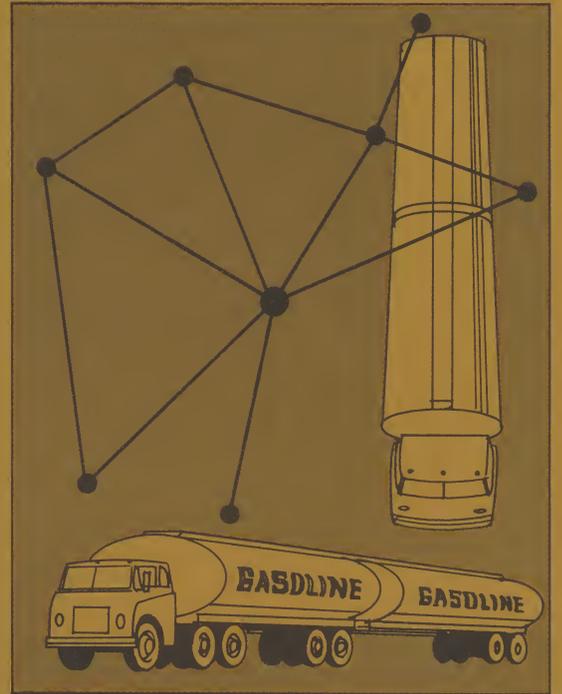# MARATHON OIL COMPANY
USES TELETYPEWRITER NETWORK

to speed sales data
from terminals to home office

TELETYPE ®

case history:

Marathon Oil Company mails invoices the day after sales are made . . . and keeps tight control over inventories at its distribution terminals. These are some of the benefits Marathon derives from its new teletypewriter network.

Possibly the first such system in the oil industry, it links Marathon's distribution terminals with a data processing center at corporate headquarters. In addition to faster cash flow from faster billing, tight responsive terminal inventory control enables Marathon management to respond more quickly to marketplace demands.

Full details on how Marathon's new communications system works are contained in the following pages. The same story recently appeared in the pages of leading industrial publications.

For information about applications of leased Teletype equipment, consult your local telephone or telegraph company. Or, to purchase, contact us at our general offices address on the back cover.

MARATHON OIL COMPANY
FINDLAY, OHIO

MARATHON OIL COMPANY SALES DATA SPED TO COMPUTER VIA TELETYPEWRITER NETWORK

DISTRIBUTION TERMINALS LINKED TO HEADQUARTERS

Marathon Oil Company is proving that moving business data fast through the "pipelines" of a new teletypewriter network linking its widespread operations can make an important contribution to profits.

And quick digestion of that data by hungry computers at corporate headquarters in Findlay, Ohio, is in turn providing a growing list of benefits from faster cash flow to tighter inventory control. Down the road is a total Management Information System with on-line inquiry capabilities.

Believed to be the first oil company installation of its type, the data communications network now nearing completion links the majority of Marathon's distribution terminals to an up-to-the-minute data processing center. This teletypewriter network was designed by Marathon personnel in cooperation with Ohio Bell Telephone company data communications specialists.

The terminals, which are located in key marketing areas from Michigan to Texas and Florida, annually dispense millions of gallons of varied petroleum products for wholesale and industrial customers, as well as for some 3,600 independent retail service stations selling under the Marathon brand name.

Over 30 locations are now tied into the system which is primarily used to transmit wholesale sales data to Findlay, where this information is translated by computer into customer invoices, accounts receivable records and a number of different sales analysis reports.

Being phased in is computer-monitoring of terminal inventories. This step relates to a rapidly-developing, complex method of planning the complete movement of products—whether they are at refineries, in pipelines, aboard barges, or in storage at terminals or retail outlets. Here, an array of computer-generated reports will provide data quickly to those within the company who must make far-reaching decisions.

The adoption of modern data communications and processing techniques has been in keeping with Marathon's long history of pro-

Marathon Oil Company distributes its products through automated terminals located in key marketing areas from Michigan to Texas and Florida. The majority of these outlets are tied to Marathon's headquarters through a teletypewriter network, which is used to transmit wholesale sales data for computer processing.
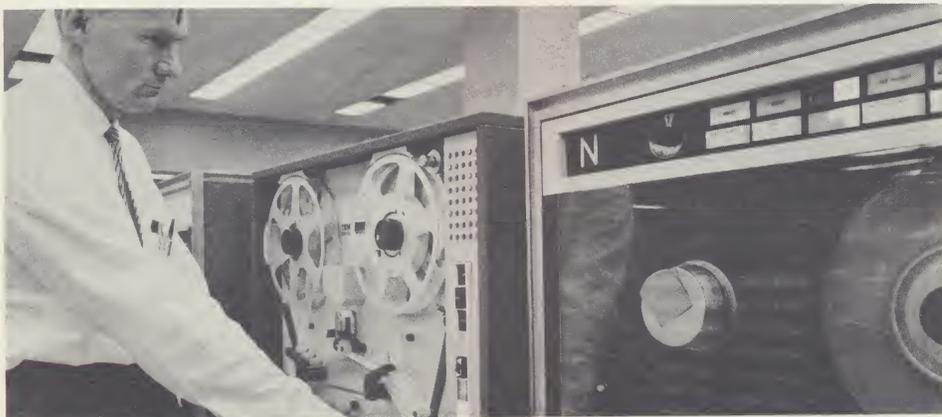
A Teletype Model 33 ASR (automatic send-receive) set provides the data communications link between distribution terminals and Marathon Oil Company's computer operations in Findlay, Ohio. At the Arlington Heights, Illinois, terminal shown here, William W. Little, manager, prepares page copy and a punched paper tape of data summarizing wholesale sales made during the previous 24-hour period. This information is drawn from loading tickets written out for each shipment. The tape is transmitted late each morning to Findlay.

Claude M. Janes, manager, Procedures Research and Data Processing Division, observes data coming in from Marathon's distribution terminals. Data is received on a Teletype Model 35 ASR (automatic send-receive) set in page copy and punched paper tape form. Page copy is checked for any apparent errors, with the tape later being read into computers to prepare an assortment of documents and reports.

Punched paper tapes produced to contain data received from Marathon's distribution terminals are first fed through a computer input tape reader located within the Data Processing Center. This unit makes several different error checks on the data before conversion into cards for further processing.

After data has been checked for errors by a computer input tape reader, it is converted into cards for processing through computer equipment within Marathon's Data Processing Center.

gressive strides in the vast oil industry. Founded in 1887 by a group of Ohio men determined to build a successful crude oil producing company in spite of chaos in the marketplace, Marathon has grown steadily to become a significant factor in the petroleum business. It is active in all phases of the oil industry, including exploration, production, transportation, refining, marketing and research. Operations are spread around the world, with employment near 7,800. Annual revenues are well past the half-billion dollar mark.

COMPUTERS PERFORM UNIQUE FUNCTIONS

Marathon has been computer-oriented for several years in a variety of applications. One example is the use of computer simulation to help plan their refining program for highest efficiency.

In like respect, the company has been teletypewriter-oriented for some time, with the machines serving as a communications link between an assortment of United States refining, production and research facilities and headquarters in Findlay. Information transmitted has ranged from payroll and production data to general administrative messages. Bell System Teletypewriter Exchange Service (TWX) circuits also permit ready communications with customers and suppliers.

According to company officials,

distribution terminals had traditionally sent sales data through the mails to Findlay for the preparation of invoices and other documents and reports. This normally meant a delay of several days before bills could be rendered and paid, in turn causing an inevitable drag on cash requirements.

Today, sales data is transmitted quickly over regular telephone lines and the entire invoicing process is computerized. The result: bills are mailed the day after sales are made—and management has optimum control of cash flow. Also, the computer provides the vital related information needed by management to run a more efficient and profitable business.

MODERN TELETYPE EQUIPMENT EMPLOYED

Each terminal employs a Teletype Model 33 ASR (automatic send-receive) set as its data communications equipment. This machine operates at 100 words per minute (10 characters a second) and uses the United States of America Standard Code for Information Interchange (ASCII). It features a send-receive page printer, a paper tape punch and a paper tape reader which can be used in various combinations. A four-row keyboard provides the typing ease of a regular office typewriter.

At the Data Processing Center receiving data from the terminals is a Teletype Model 35 ASR set which is used for heavy duty operation where continuous service is required. Operations are similar to those of the Model 33 ASR.

SHIPMENT DATA PUNCHED INTO TAPE

As each product shipment moves from the terminal to a customer, the loading ticket is routed to the Model 33 ASR set operator. This ticket shows complete order information, including name of customer, carrier, product descriptions, gallonages loaded, temperature of storage tanks, and the like. This data is then translated simultaneously by the operator into page copy (for checking accuracy) and codes punched into paper tape. A standard format is followed to segregate order information into several specific categories.

To facilitate computer processing of the data, a 13-digit numerical code serves to identify such fixed customer information as name, destination, carrier, consignor and the Marathon location from which the shipment is made. This code is entered on the loading ticket when the customer's order is filled. As the teletypewriter operator prepares a paper tape containing order data, the code is punched in as a substitute for the details it represents. The 13th digit is a control number which the computer later reads to determine if the entire code was transmitted correctly.

Orders continue to be punched into tape until 7:00 a.m., official cut-off time for a particular day's business. The dispatcher then checks the terminal's meters and calculates total gallonages of all products shipped during the previous 24 hours. These figures are entered at the end of the tape, which is then loaded into the ASR set's tape reader ready for transmission when requested by headquarters in Findlay, Ohio.

DATA TRANSMITTED TO FINDLAY

Starting at about 11:30 a.m., the Data Processing Center calls—or "polls"—each terminal's Model 33 ASR set in rotation via a Bell System Full Time Wide Area Telephone Service (WATS) line. Calls are placed through the dialing apparatus on the Center's Model 35 ASR set with the terminal's equipment being automatically activated to transmit its tape of data. Transmission is via Bell System Data-Phone Service.

Punched at the Center is a continuous tape duplicating those transmitted and page copy is typed out. Copy is given a visual check for any apparent errors. By the time lunch hour is over, all data has been received and the WATS line is free for normal use in making long distance calls.

TAPES FED DIRECTLY INTO COMPUTER

In describing computer operations, Claude M. Janes, manager, Procedures Research and Data Processing Division, states that the continuous paper tape is next fed directly into a computer input tape reader. This unit first checks to determine whether or not the terminals sent in complete delivery information for the 24-hour period. Each 13-digit customer code is

The Data Processing Center at Marathon Oil Company features a complex of computers which digests data from distribution terminals to produce customer invoices, accounts receivable records and a number of different sales analysis reports. The Center is under the supervision of Claude M. Janes, manager, Procedures Research and Data Processing Division.

also checked for accuracy at this time, with the 13th digit being used by the computer as a control code.

All data proven to be accurate is converted to cards by the computer for further processing. A report is printed out of any errors, which then must be rectified.

The cards, plus others that have been punched to contain certain sales information, are read into a complex computer system. Produced are a variety of documents from invoices and accounts receivable records to sales analysis reports.

The computer automatically takes a great deal of the work out of preparing invoices by performing such tasks as extending prices, adding applicable taxes, and calculating freight. Invoices are on the way to customers within about 24 hours after shipments leave the terminals.

"An additional important benefit derived from receiving data faster from the field," comments M. D. King, manager Supply & Distribution Division, "is our ability to check more quickly the forecasts we make of stock replenishments for terminals. To ensure that adequate product levels are available at all times to meet customers' needs, it is necessary to schedule deliveries several months ahead of time all the way back through the system to the refineries. We're now able to react to marketplace demands in a matter of hours."
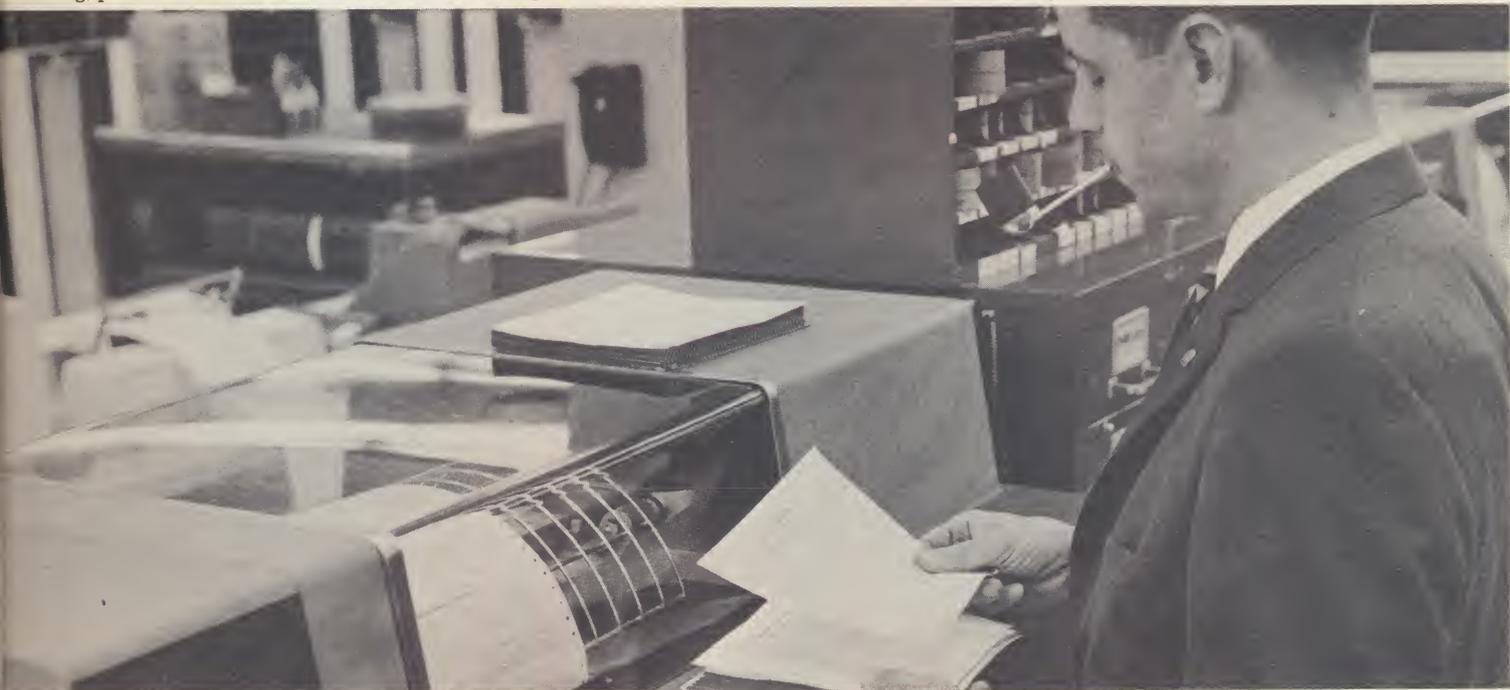
WHAT'S AHEAD

"The data communications network will play an increasingly important role in keeping track of our products, regardless of where they are in our complicated distribution system," concludes King. "Additional types of data will be coming in and processed through the computer giving pertinent facts which in turn will help improve the utilization of our distribution operation.

"Within a few months we anticipate having terminal and other distribution inventory information on the computer system. Beyond that will be the same type information for refineries as well as improved monitoring of shipments in pipelines, barges and other significant items affecting product inventories. As these stages are reached, we will be that much closer to a total products Inventory Management System—with its attendant benefits of being better prepared to supply various products in the volumes required by our customers at the place and time demanded.

"Also in our plans is an on-line system utilizing teletypewriters as computer-inquiry devices. This will offer certain management people the capability of fast access to information relative to their part of the business, which we hope will help them make better, more timely, business decisions."

Van Burns, Marathon's manager, Refining and Marketing Accounting Department, checks customer invoices being prepared at the Data Processing Center. The rapid transmission of data to the Center from distribution terminals, coupled with split-second processing, permits Marathon to mail invoices the day after sales are made.

TELETYPE

®

machines that make data move