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How Teleregister special purpose systems

SPEED OPERATIONS,

INCREASE EFFICIENCY,

#### MAKE SAVINGS POSSIBLE

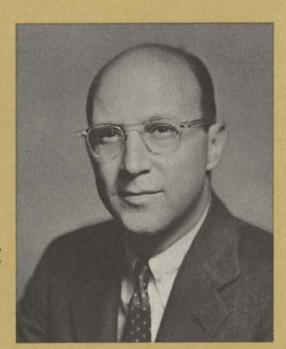
wherever you have a substantial inventory control or data-processing problem

THE TELEREGISTER CORPORATION

445 Fairfield Avenue Stamford, Conn.
A SUBSIDIARY OF OGDEN CORPORATION



ROBERT DAINE, Chairman of the Board



S. J. SINDEBAND, President

#### **Special Purpose Systems**

In the expanding Age of Electronics, the needs of industry, commerce and the military have led to the development of two types of electronic and electromagnetic systems.

The capacity and potential of general purpose systems have

been demonstrated in many practical installations.

The advantages of special purpose systems are not yet fully

recognized or appreciated.

Special purpose systems are custom-tailored to meet specific needs and requirements. The emphasis is not on standardized machines but on creative engineering applied to particular problems.

A special purpose system has three basic advantages:

- 1. It is economical; it provides only the equipment you need when you need it. It requires no commitment to excess, unused capacity.
- 2. It is flexible in scope and application. It can be designed to handle relatively small problems as well as large, complex problems.
- **3.** It does not usually require disruption of existing operating procedures and policies. It strengthens them, makes them more effective.

The Teleregister Corporation, a recognized pioneer in the development of special purpose equipment and systems, has substantial experience to offer any company or branch of the armed services requiring economy, flexibility and adaptability in electronic systems.

On behalf of the men and women who comprise Teleregister, we take pride and pleasure in summarizing a portion of that experience on the following pages

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S. J. SINDEBAND President 1929
First automatic electric stock quotation boards placed in service.

1941
Special purpose electronic engineering tronic engineering projects undertaken projects undertaken for Armed Forces.

Teleregister Network
of stock and comof stock and commodity quotation
modity quotation
boards extended to
pacific Coast.

1946
First electro-mechanical reservations system developed for use by American Airlines.

First electronic reservations control system, Magnetronic tem, Reservisor and installed.

TELEREGISTER MILESTONES

First electronic data processing system for a stock exchange installed in Toronto, canada.

1955
First electronic reservations control systems developed for leading railroads.

1955
Teleregisterelectronic
controls selected for
controls automated
Kidde automated
Warehousing system.

First electronic inventory control system in rubber industry engineered for Hood Rubber Division of B. F. Goodrich.

#### **Pioneering Since 1928**

Teleregister is one of the oldest names in high speed data transmission and display. Founded by Robert Daine in 1928, the Corporation pioneered the introduction of basic automation principles in the financial community. The Teleregister System made it possible to display, on special boards in brokers' offices from coast to coast, complete data from leading stock and commodity exchanges within seconds after any financial transaction. Today the Teleregister Network serves over 400 leading brokerage offices.

Experience gained in this electromagnetic system enabled the Corporation, during World War II, to pioneer with more complex "inventory control" and data-processing systems for the military.

As high-speed digital computers, magnetic storage units and other electronic components were perfected, the company advanced rapidly in the field of special purpose electronic engineering. Teleregister was the first (working with engineers of a leading airline) to design and install a successful magnetic drum system for commercial use. This pioneer system, Teleregister's Magnetronic Reservisor, has since been adapted as the first electronic reservations control system for use on America's railroads.

Other examples of Teleregister's pioneering and experience, described on following pages, include development of the first special purpose inventory control system in the rubber industry and the design of electronic controls for the first fully-automated warehousing system.

Teleregister is one of the few companies with a record of a quarter of a century of practical, tested experience in the design and installation of special purpose data-processing and data-transmission and display systems.

## TELEREGISTER experience, imagination and skill make the difference.

Thousands of qualified engineers are familiar with the basic principles — and potentials — of modern electronic devices.

The component parts of data-processing systems are available to every engineering firm.

Yet Teleregister engineers, time after time, competing against other top engineers and designers, have come up with practical, economical special purpose systems that have set the pace in key American industries.

What makes the difference?

Three things:

- 1. Practical experience. Teleregister's senior engineers and designers have a background of practical experience that, man for man, is equaled in few other companies. For upwards of a quarter of a century, they have been working out practical solutions to specific customer problems.
- **2. Applied imagination.** Teleregister engineers are not schooled to sell a particular machine or a particular system.

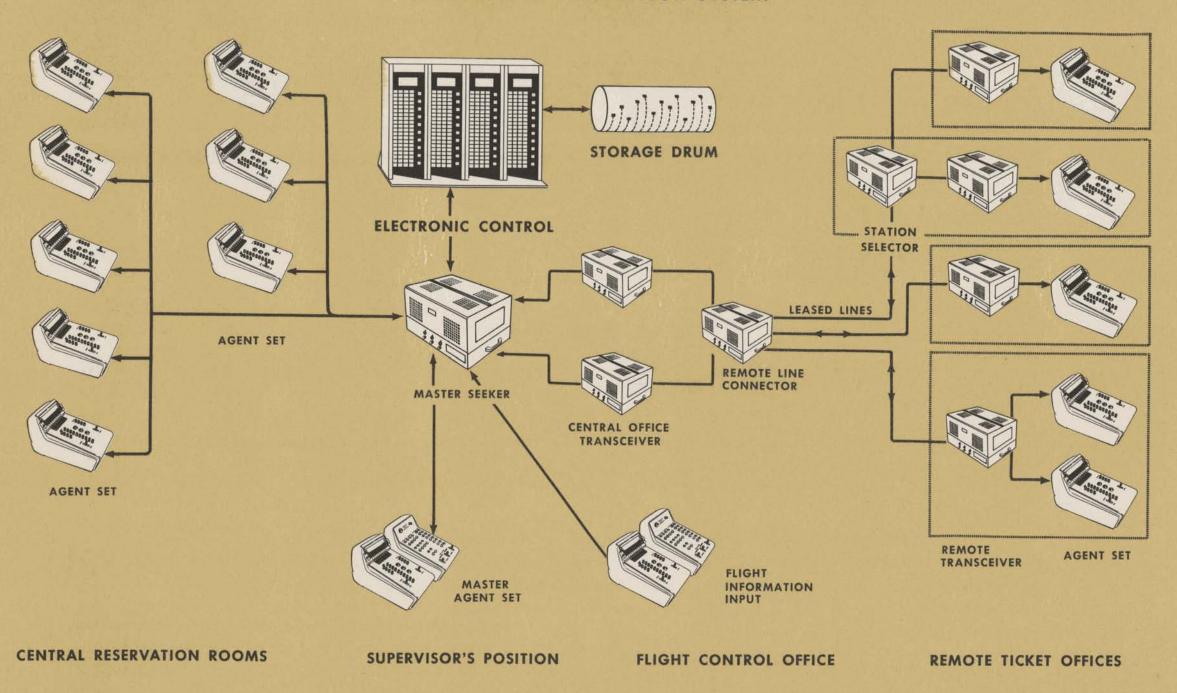
They are free to consider every aspect of a customer's current operating procedures.

**3. Technical skill.** The technical skill built into every Teleregister special purpose system is attested by the superlative performance record of installations in daily commercial use. For example, component parts of some installations have been used for more than 20 years without replacement.

The distinctive feature of Teleregister engineering is its flexibility. Teleregister engineers are not committed to a single method or approach to customer problems. Company operations are not influenced by substantial inventories of particular devices. Teleregister engineers can tackle each new project with an open mind. They can expand or contract the performance potential of old systems to meet specific new requirements.

If there is a more efficient, more productive, more economical way of solving a problem than has been tried in the past, Telerregister engineers are free to discard old approaches and seek new ones.

#### MAGNETRONIC RESERVISOR SYSTEM



Schematic diagram showing elements in typical Teleregister Magnetronic Reservisor System.

#### RESERVATION SYSTEMS

"Inventory control" is a major problem for airlines, railroads and other transportation systems.

Fast, accurate handling of reservations and sales of available space is vital. Without up-to-the-second control of sales, carriers risk loss of income; they impair their public relations; they create confusion among operating personnel.

Teleregister engineers, working with traffic experts of a leading airline, were the first to come up with a practical electromechanical solution to the problem of handling passenger reservations. They developed a special inventory panel from which ticket agents at remote points, using simple push-button keysets, could determine availability of space on many flights for days in advance. This system was installed for American Airlines in Boston in 1946.

The basic principles of this pioneer installation are used today, with modifications and improvements, in Teleregister's Reservation Availability System.

Teleregister devised and installed the first successful commercial electronic inventory control system, the *Magnetronic Reservisor*, in 1952, using a magnetic storage drum to store information.

Both the Availability System and the Magnetronic Reservisor System are amazingly simple in operation. In each case the ticket agent or reservations clerk works with a compact keyset with a number of push button controls.

When the customer applies for a reservation, the clerk inserts a small destination plate in the keyset and depresses appropriate buttons indicating the volume of space desired and the date.

Within seconds, lights on the keyset provide availability data on the specific flight or train — and on alternate space.

In a Magnetronic Reservisor System the reservations clerk, when making a sale or receiving a cancellation, can instantly record the change in space inventory on the storage drum by a flick of a special switch.



## The American Airlines MAGNETRONIC RESERVISOR

Teleregister and American Airlines spent eight years in electronic research, testing and development before this pioneer reservations system was placed in operation at LaGuardia Airport in New York City in 1952.

Hailed by American Airlines as "the greatest improvement in reservations service in 25 years," the Magnetronic Reservisor System is currently being expanded to meet reservations control needs at other locations.

Today an agent at these locations can determine the availability of space, within seconds, on up to 1,000 flight legs per day for a twelve-day period. The success of this system is demonstrated by the fact that Teleregister is now installing for American a similar system with a capacity of 2,000 flight legs per day for a full month.

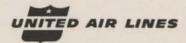
Here is what an American Airlines official says about this revolutionary system:

"The Reservisor has contributed to the accuracy of our system, has speeded up the process of obtaining a reservation and a ticket, has increased the Company's revenue by permitting the more adroit merchandising of alternate yet equal accommodations and has accelerated the resale of cancelled space by returning it to available inventory almost instantaneously.

"The Magnetronic Reservisor is a welcome part of our Agent's day. Some were dubious when it was first installed. Today they wouldn't part with it."



Close-up of "Read" and "Record" heads on horizontal magnetic drum in typical Teleregister installation.



### The United Airlines "UNISEL"

"Unisel" is the name of a Reservations System designed to meet the special requirements of United Air Lines. The first phase, an availability system, was placed in service in four key traffic centers — New York City, Chicago, Los Angeles and San Francisco — in 1955.

In the availability system, agents' and reservations clerks' key-

sets are connected with Teleregister-developed availability panels on which flight inventory data for 33 days is maintained.

Only when space on any flight has been reduced to a pre-determined "cushion" does the agent have to check availability by telephone.

Keysets used at remote locations are identical with those used

in Magnetronic Reservisor Systems.

"Unisel" has been designed for expansion in a later phase to a system in which the local availability systems will operate as satellites to a central Magnetronic Reservisor System whose storage drum will keep an exact, electronic count of all seats available.

Sales or cancellations will then be recorded on the drum directly from each keyset. Availability information will be obtained from the local Availability Panel. As the seat count on the central drum is reduced to the "cushion" or to a "sold out" condition for a given flight, this information will be transmitted automatically to the satellite locations.

Reservations clerk checks availability of space in "Unisel" system developed for United Air Lines. Special availability panels shown in background.



#### New York Central Railroad

#### "CENTRONIC"

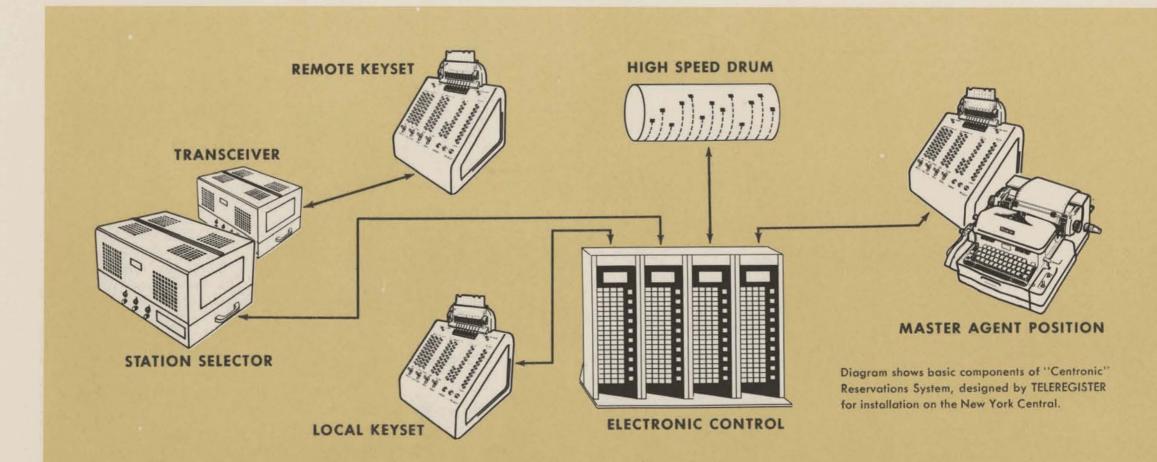
Originally, the New York Central planned to install Tele-REGISTER reservations control equipment only to serve passenger traffic on lines East of Buffalo. Within weeks, the scope of the contract was enlarged to cover the entire Central system. The installation now being designed will be the most comprehensive electronically-controlled reservations system ever devised for a single company. It will be a part of an electronic, coast-to-coast reservations network that will speed the handling of reservations on many carriers from virtually any section of the country.

Alfred E. Perlman, president of the Central, says:

"'Centronic' is the herald of a new day in our continuing effort to provide fast, accurate and dependable service to passengers seeking reservations on our trains. It is our answer to a problem that has vexed travelers and the railroad alike — lines at ticket windows.

"We believe that 'Centronic' will produce tangible benefits through the improvement of service to our customers, the use of a higher percentage of space, and savings through greater efficiency."

Initially, the 'Centronic' system will serve 48 locations in 36 cities. In addition to handling reservations, possible future applications include handling of all coach traffic, train time-table information, fare information, printing of tickets and automatic ticket accounting.





# National Airlines AVAILABILITY SYSTEM

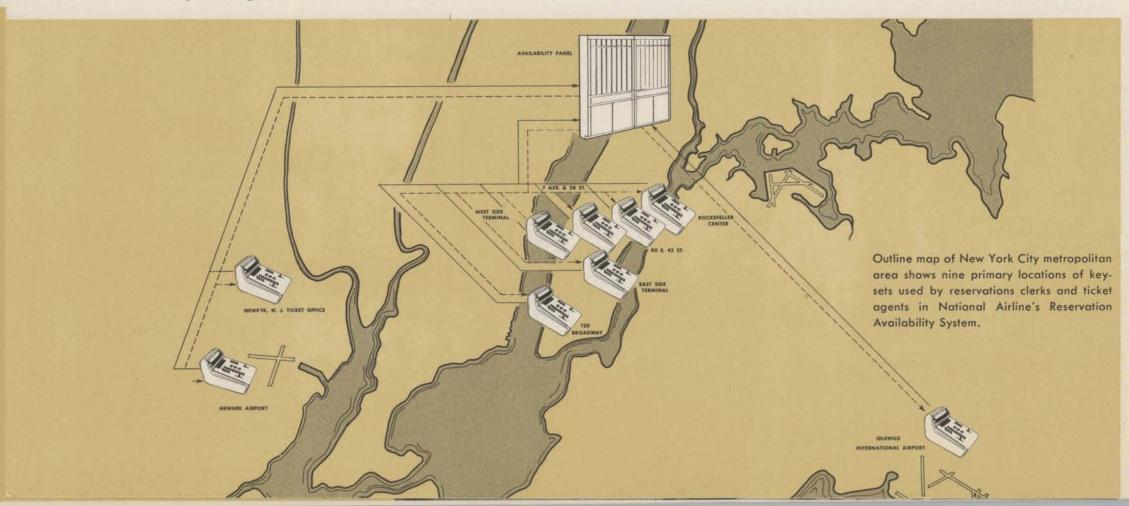
National Airlines faces a special reservations control problem in that its traffic, largely between New York and Florida, is unusually high during the mid-Winter vacation period. Any system engineered to meet National's requirements must be flexible enough to cope with these traffic peaks and economical enough to justify operation on a year-round basis.

Teleregister has met these requirements for National by developing a reservations availability system that will speed up handling of customer inquiries throughout the year and permit temporary expansion during peak travel periods.

This has been accomplished by making it possible to increase, whenever needed, the number of "keysets" used by reservations clerks and ticket agents at remote locations. Made available on a rental basis, as is all Teleregister equipment, these extra units, which are interchangeable with equipment used on other airlines, can be taken off the system during periods when traffic loads are not unusually high.

The first installations will be made in the New York metropolitan area, with the possibility that the same type of system will be used in other cities served by National.

National's availability system includes also a "flight information" feature that enables clerks and ticket agents to get up-to-the-second data on deviations from published arrival and departure times.





# Braniff International Airways RESERVISOR SYSTEM

The reservations control system designed by Teleregister for Braniff is distinctive in that it makes use of the airline's existing communications network to transmit information to and from a magnetic drum. This ability to custom-tailor an installation to make maximum use of a customer's present facilities is an important feature of Teleregister engineering.

The Braniff inventory storage drum will receive all messages transmitted by Teletype from all Braniff stations and sales offices.

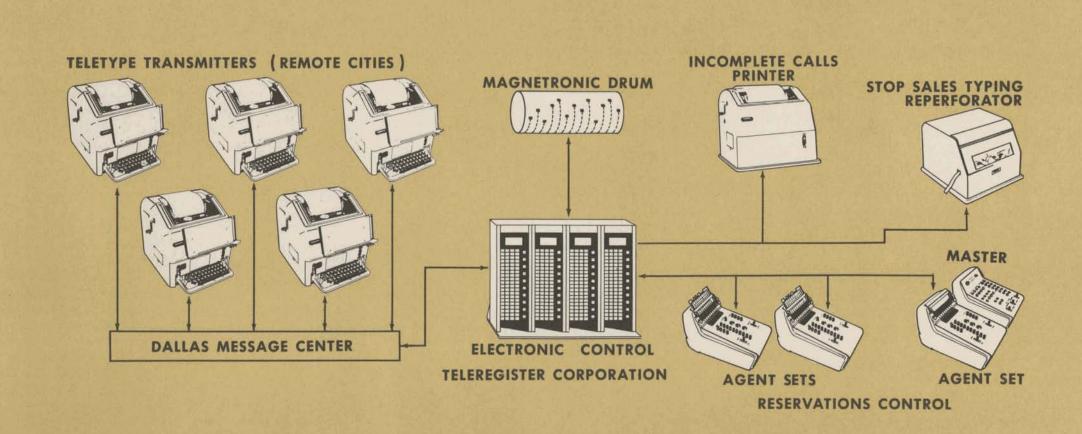
It will automatically record sales, cancellations and other information relative to seat space.

This equipment will also originate electronically its own reports to be transmitted over the Braniff Teletype net when the space status of a flight is changed. It will reply automatically to reservations inquiries, over the same network, and record these replies. The unit will be tied in with Braniff's entire communications network of approximately 12,000 miles of Teletype wires connecting 58 cities in the United States and, by radio and radioteletype at Miami, the Latin American cities served by Braniff.

Rex Brack, Braniff vice president for traffic and sales, says:

"By increasing the speed and efficiency of our reservations and sales procedure, we are taking still another step in servicing the flying public by saving its time . . . Braniff is the first airline in the world that has adopted such a program on a system-wide basis."

The system, which is designed to accommodate a substantial increase in traffic will keep track of seats on all flights throughout the Braniff system 31 days in advance.



#### Atchison, Topeka



# & Santa Fe Railroad

The reservations control system developed for the Santa Fe, the first Western surface carrier to handle its space inventory electronically, utilizes circuits over greater mileage than that of any similar electronic system.

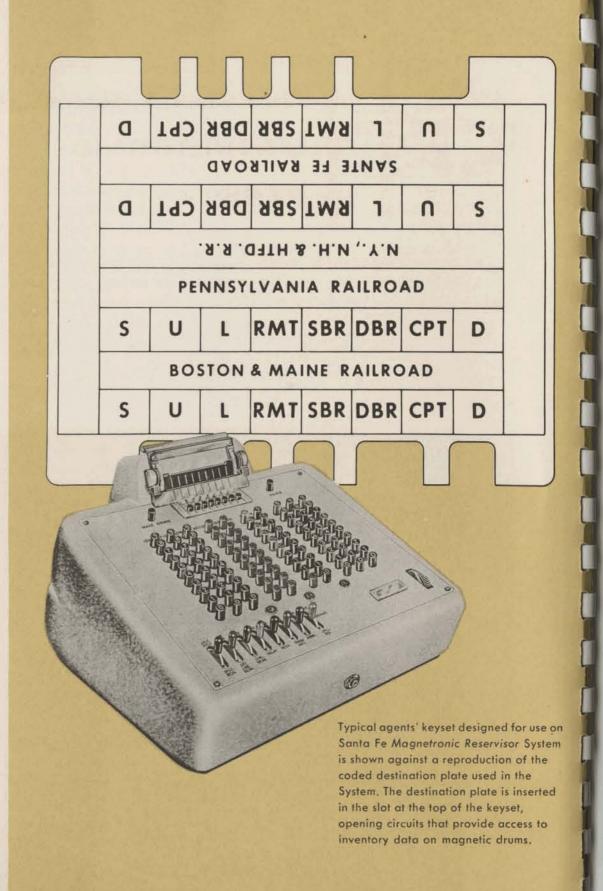
SYSTEM

Such remote locations as Chicago, Los Angeles, San Francisco and Fort Worth will be linked to the central electronic equipment monitoring the inventory of the Santa Fe's space accommodations.

Completion of the Santa Fe installation, coupled with installations for the New Haven Railroad and the New York Central Railroad, will make possible a coast-to-coast electronic network to speed handling of reservations inquiries.

This means that a passenger on the West Coast would, for example, be able to determine within seconds availability of space requested on a New York-to-Boston train. Under existing procedures, the time required to get confirmation of space in another section of the country may be two or three days.

Thus Teleregister special purpose system engineering is opening up an entirely new era in passenger transportation service, raising customer service standards to higher levels and improving operating efficiency of progressive carriers.





## New Haven Railroad MAGNETRONIC RESERVISOR

The Teleregister Magnetronic Reservisor System scheduled for operation on The New Haven Railroad in 1956 will be capable of handling up to 3,000 requests per hour at five major traffic centers.

The System utilizes a magnetic drum equipped to store data on the availability, reservation and sale of approximately 100,000 individual space accommodations during a 31-day period.

Installation of the Teleregister system is a key feature of

the five-year, \$64,000,000 improvement program announced by The New Haven in March, 1955.

The president of The New Haven has declared:

"Adoption of the Magnetronic Reservisor is another practical demonstration of automation at work to improve service for users of The New Haven Railroad. It will mean that prospective passengers can get split-second service on any type of reservation inquiry or sale. It will eliminate the possibility of certain types of human error that are bound to develop in a manual reservation system. And because it will provide up-to-the-minute central control, it will mean that we can do a more effective job of selling all types of available space."

Original installations of Teleregister equipment will be in New Haven ticket offices in New York, Boston, New Haven, Hartford and Providence. The network will be expanded to other New Haven traffic centers as passenger volume increases.



Preliminary map of Magnetronic Reservisor communications network for The New York, New Haven & Hartford Railroad.

#### INDUSTRIAL INVENTORY CONTROL

Efficient planning, production and merchandising in today's expanding economy require fast, accurate inventory control. Until recently, handling of inventory data has been tedious and time-consuming, subject to costly error in the posting, transmission and display of vital information.

Industrial inventory control systems designed and engineered by Teleregister have three distinctive features:

- 1. They are completely flexible, designed to meet individual customer requirements. They can be applied economically to relatively small inventory control problems as well as to the largest industrial enterprises.
- 2. They utilize Teleregister's unparalleled experience of more than a quarter-century in data-processing, transmission and display of financial data.
- **3.** They are capable of producing punched tapes which have codes compatible with punched card codes, so that data may be entered on punched cards for analysis and accounting.

Basic in Teleregister's industrial inventory control systems

are magnetic storage drums similar to those developed for use in passenger reservation systems.

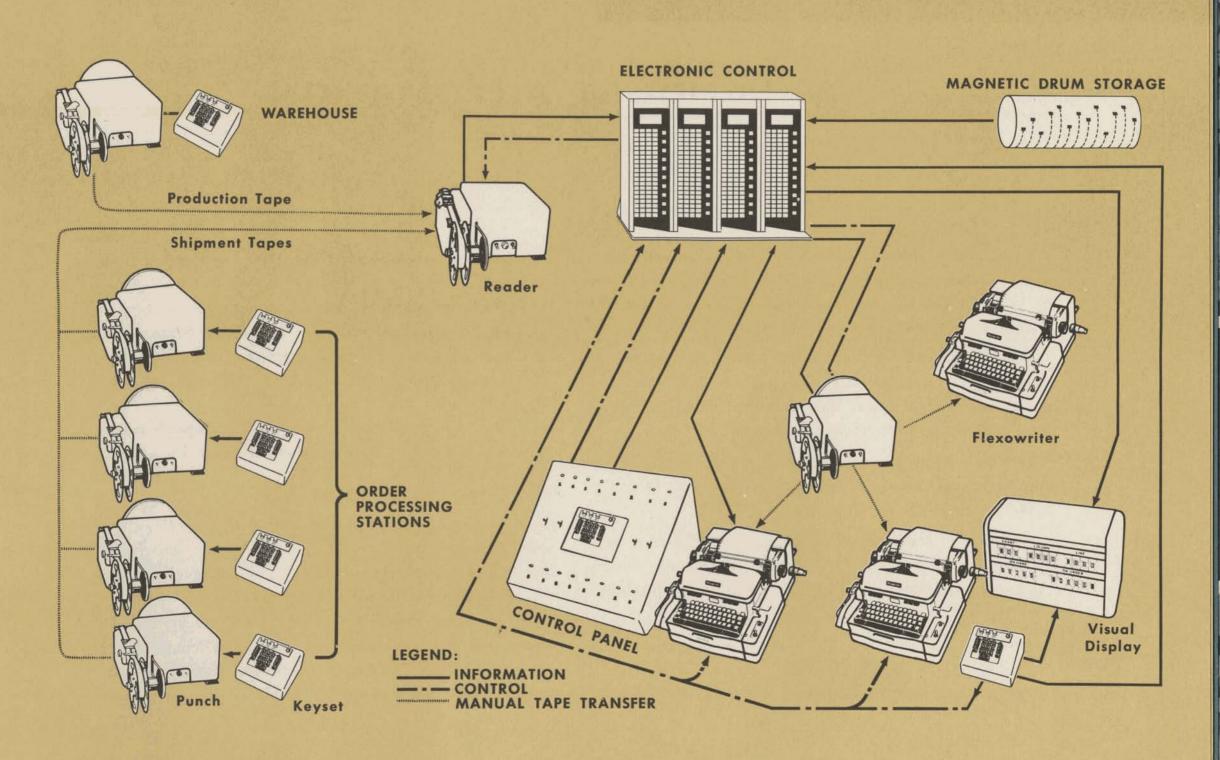
A typical Teleregister installation, first of its kind in the rubber industry, is the inventory control system developed and engineered for Hood Rubber Company at Watertown, Mass. (Division of B. F. Goodrich).

Its storage drum holds and makes available for instantaneous visual and printed reference many thousands of style-size items and records the quantities of each style and size committed for future shipment.

The system produces on demand a tabular description of the numerical difference between quantities "on hand" and "committed orders" for any or all styles stocked by the company. It generates permanent records of individual transactions, useful for preparing punched card summaries for accounting or forecasting procedures.

Teleregister's industrial inventory control systems can be applied with minor modifications, to control of inventories in mail order houses, distributors' warehouses, large retail establishments and in many military materials handling situations. It can also be adapted to insurance company operations.

#### TELEREGISTER MAGNETRONIC INVENTORY CONTROL SYSTEM



#### WAREHOUSE AUTOMATION

Teleregister electronic controls were selected as the "brains" of the revolutionary new *Warehousing System* developed jointly by Walter Kidde Constructors, Link-Belt Company and The Teleregister Corporation.

This new system, hailed as the first successful application of automation in the field of warehousing, applies "bulk order picking" principles to the flow of many individual items from a warehouse to any number of different destinations.

Tests indicate that, in a typical warehouse, the system can reduce the walking distance of order pickers from 1,000,000 feet to 10,000 feet in a single day's operations.

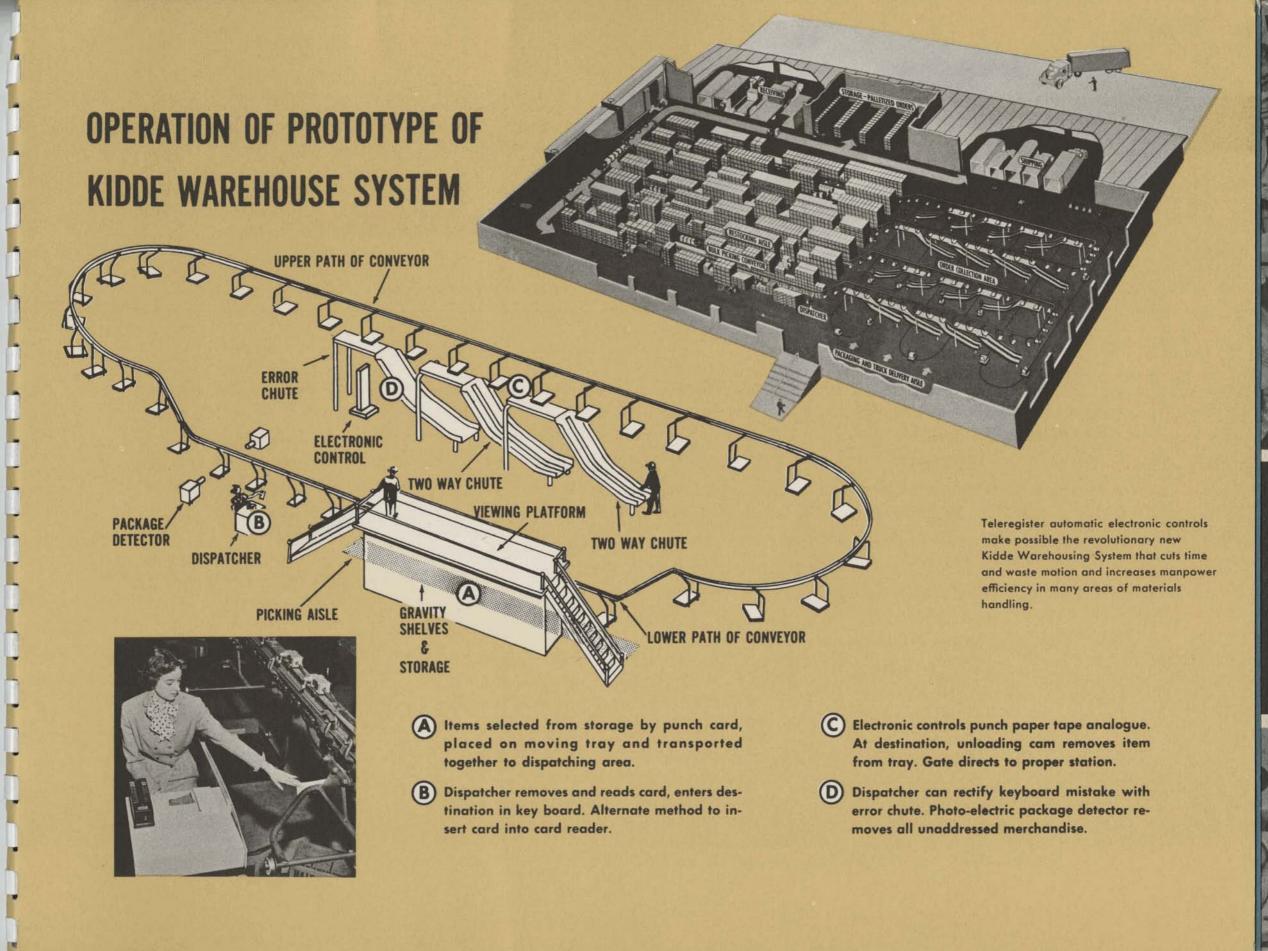
Featuring an endless overhead conveyor with carrier trays spaced at regular intervals, the electronic Warehousing System can be described briefly in the following sequence of operations:

1. Shipping orders for the day are coded on standard punched cards which show the quantity of each item to be shipped to each destination. The cards are then assembled according to the warehouse location of each item. (For example:

all orders for a given brand of soap would be grouped in one batch).

- 2. Order pickers proceed to the warehouse locations indicated on the punched cards delivered to them. Following the instructions on each card, they place the card's order on a passing conveyor tray. They also attach the card itself to the top of the tray.
- **3.** As the tray reaches the electronic dispatch station, the card is removed by the dispatcher and inserted in a special "reader" device.
- **4.** This "reader," connected to an analog device, sets in operation the mechanism that will automatically unload that particular conveyor tray at the chute where all other items for the same destination are being gathered. (The dispatching mechanism can also be operated manually, if desired).

The electronic automation principles utilized in this new Warehousing System can readily be applied to materials handling problems encountered in freight depots, post offices, food distribution centers and truck terminals.



#### **AUTOMATIC QUOTATION DISPLAYS**

For more than a quarter of a century the Teleregister Network of automatic electric quotation boards, engineered and designed by the Corporation, has served America's leading brokers from coast to coast.

These boards make it possible for brokers to display instantaneously the latest stock and commodity quotations from the following leading trading centers:

New York Stock Exchange
American Stock Exchange
Midwest Stock Exchange
Chicago Board of Trade
Chicago Mercantile Exchange
Commodity Exchange, Inc.
New York Cocoa Exchange
New York Coffee and Sugar Exchange
New York Mercantile Exchange
New York Produce Exchange
New York Cotton Exchange
New Orleans Cotton Exchange

From its Central Transmitting Station in New York City, Teleregister now serves over 400 boards throughout the country. Extension of this service to additional cities is progressing as rapidly as the required precision equipment can be obtained.

Price data displayed for each stock includes: (1) previous closing price, (2) opening, (3) high for the day, (4) low for the day and (5) last sale.

The number and identity of stocks on a Teleregister board is determined by the broker.

Dependability of the boards has been demonstrated repeatedly over the years. On occasion Teleregister boards have been kept in service in communities where light, power and telephone facilities have been disrupted by damaging storms.

Teleregister's quarter-century of experience in dependable, long-distance transmission and display of financial data has been adapted successfully to recent special purpose electronic projects.

Other areas in which Teleregister engineering of this type can be applied include up-to-the-second posting of train, plane and bus arrival and departure schedules, displays of flight information data, for commercial and military operators and "readouts" of electronic computer calculations.

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#### **GOVERNMENT PROJECTS**

During and since World War II Teleregister has been privileged to develop a number of special purpose engineering projects for the U. S. Navy and U. S. Air Force, the Civil Aeronautics Administration, the U. S. Weather Bureau and other governmental agencies.

Many of these projects have involved experimental work, classified for security reasons, of substantial importance to national defense. Typical projects include:

- ▶ Design and construction of special computing and simulating equipment used for training in tactical undersea warfare, with emphasis on anti-submarine operations.
- ▶ Design and construction of various aircraft status posting systems to indicate flight availability of aircraft in a large region.
- ▶ Design and construction of Automatic Station Identification Device (ASID) for the Civil Aeronautics Administration weather station system. ASID identifies a Teletype station in a network by automatically inserting the station's call signs before each message. It also saves substantial time since a station can "tune into" the network and begin transmission automatically as soon as a break occurs. This system, which

has been adopted for use by the military, also allows a station to break into the network, in case of emergency, while another station is transmitting.

- ▶ Design and construction of a Message Diversion System (MEDIS) for the CAA. This remarkable system allows a message transmitted on one CAA regional weather network to be diverted automatically to additional networks if the message is pertinent to the other regions.
- Design and construction of an Automatic Weather Reporting Teletypewriter Translator for the U. S. Weather Bureau. At secondary weather stations where no personnel is available this equipment monitors five instruments which measure air pressure, temperature, humidity, wind speed and wind direction. When the central station desires local readings, it transmits a signal activating the secondary station. Upon receipt of this signal, Teleregister designed equipment automatically takes a reading (in digits) of each instrument in sequence, translates the readings to Teletype code, transmits the data and signs off.

Teleregister's background and experience in military and other special projects provides additional evidence of the scope and flexibility of the Company's special purpose engineering.

#### THE TELEREGISTER CORPORATION

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#### REGIONAL OFFICES

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- 155 West Congress St., Detroit 26, Michigan
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- 403 West Eighth St., Los Angeles 14, Calif.
- 32 Peachtree Street, N.W., Atlanta, Georgia

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# DECEREGOSDER

