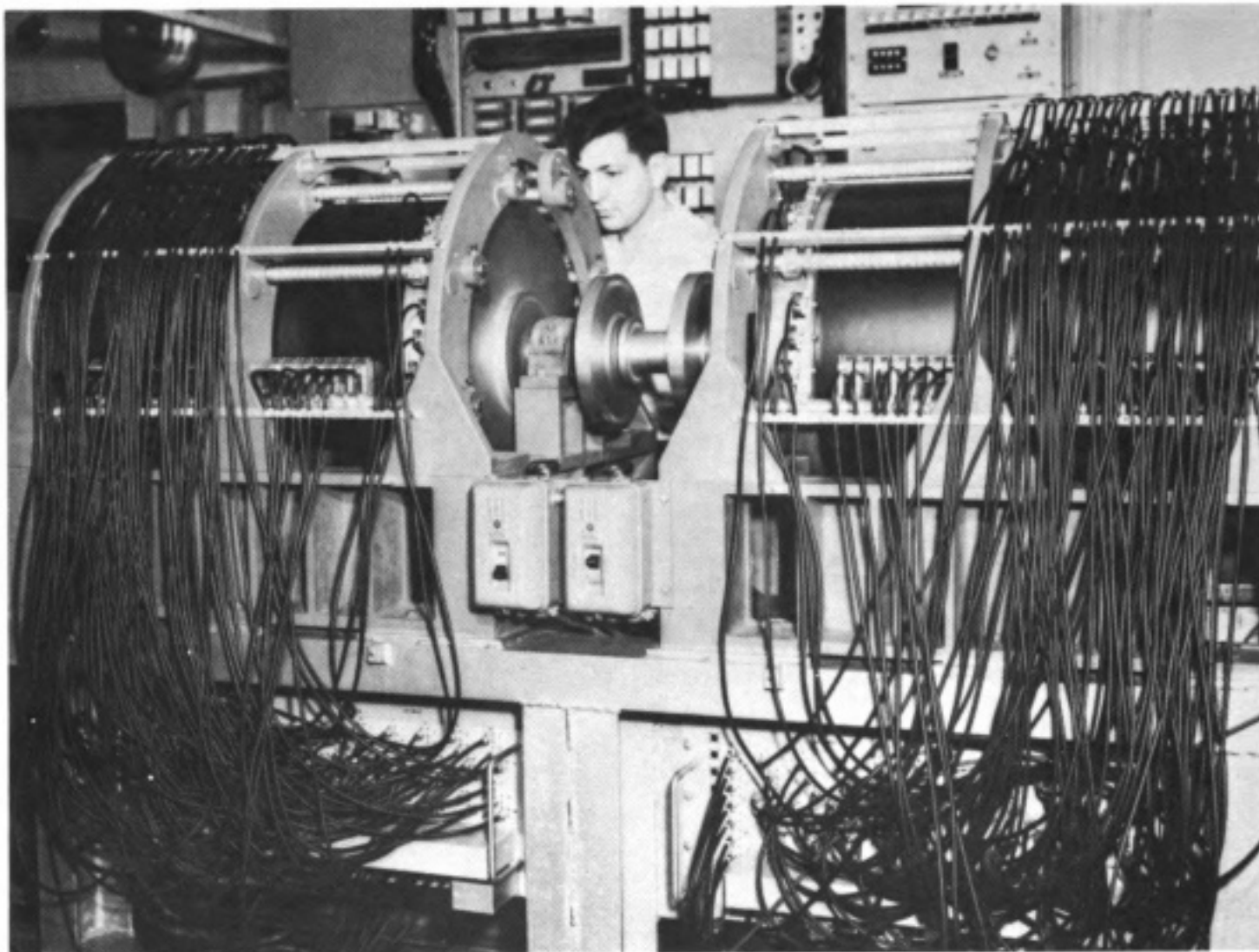


MAGNETRONIC RESERVISOR

MRA Magnetronic Reservisor (Airline)
MRR Magnetronic Reservisor (Railroad)
MAA Magnetronic Availability (Airline)

The Teleregister Corporation
Subsidiary of the Ogden Corporation



Picture by American Airlines, Incorporated

APPLICATIONS

Air lines reservations inventory control, status reports and inventory changes.

Air lines reservations availability reporting, status reports.

Railroads reservations inventory control status reports and inventory changes.

NUMERICAL SYSTEM

Internal number system is binary for the following systems:

American Airlines (Old)
American Airlines (New)
Braniff International Airways
Northeast Airlines (1st phase)
National Airlines (1st phase)
Western Air Lines
Trans World Airlines, New York City

Trans World Airlines, Chicago
Trans World Airlines, Los Angeles
National Airlines (2nd phase)

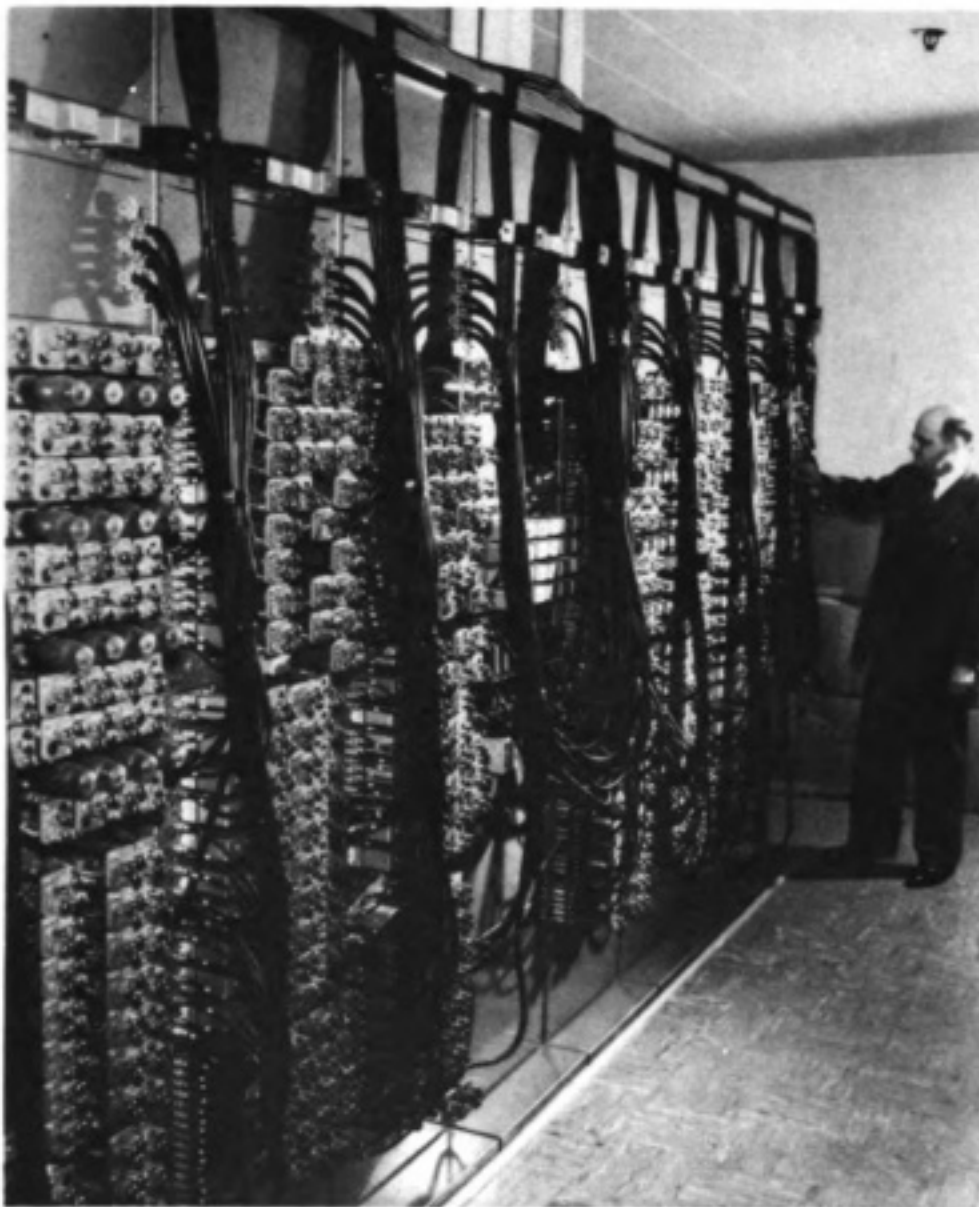
Internal number system is binary coded decimal for the following systems:

New York, New Haven and Hartford Railroad
Santa Fe Railroad
New York Central System

ARITHMETIC UNIT

Construction	Vacuum tubes
Arithmetic mode	Parallel
Timing	Synchronous
Operation	Sequential, except for the Railroad Reservoirs.

System speeds for accomplishing transactions are of the order of fractions of a second. The following table shows the speed for an average type transaction at the processor location (from completion of input



Picture by American Airlines, Incorporated

to answer), the additional time to be added for remotely located input/output stations based on teletype lines, and the maximum designed capacity for the processing of average transactions/hour.

System	Time Required for Average Transaction at Processor Location Seconds	Additional Time to be Added for Remote Stations Seconds	Average Transactions Per Hour Designed Capacity Millions of Trans/Hour
American Airlines (Old)	0.8	3.0	4.5
American Airlines (New)	0.33	3.0	10
Braniff International Airways	0.33	3.5	9
Northeast Airlines (1st phase)	0.33	4.0	10
National Airlines (1st phase)	0.33	4.0	10
Western Air Lines	0.33	4.0	10
Trans World Airlines, New York City	0.30	4.0	10
Trans World Airlines, Chicago	0.30	4.0	10
Trans World Airlines, Los Angeles	0.30	4.0	10
New York, New Haven and Hartford RR	0.50	4.0	7.5
Santa Fe Railroad	0.50	5.0	7.5
New York Central System	0.50	-	-
A major airline, contract pending	0.33	4.0	10
National Airlines (2nd phase)	0.33	4.0	10

Some reserivisor systems have more than one supervisory control position. The following table shows the number of master positions, the number of sub-supervisory positions at the data processing center, and the number of sub-supervisory positions in remote cities:



Picture by American Airlines, Incorporated

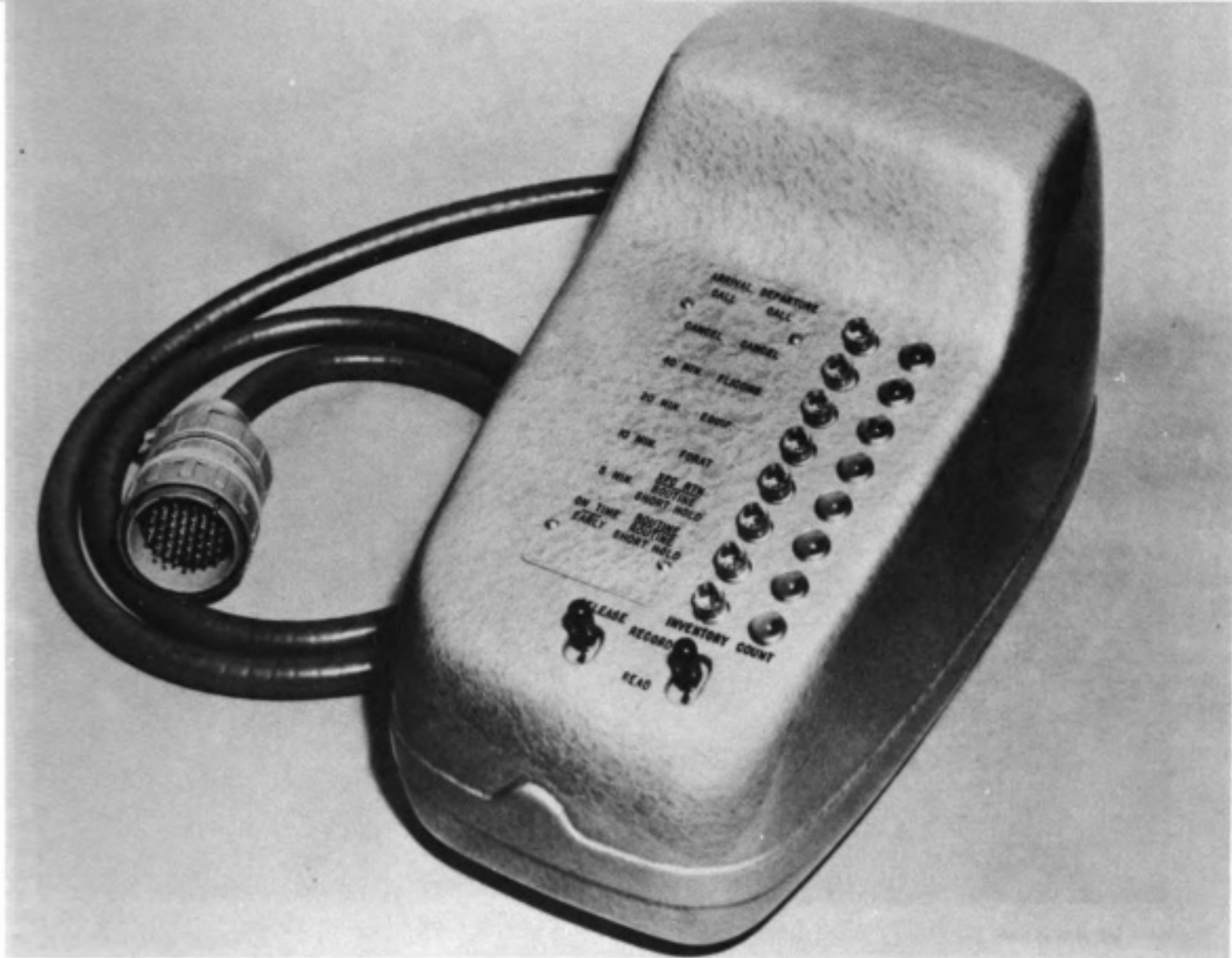
System	Master Positions	Sub-Supervisory Positions (Local)	Sub-Supervisory Positions (Remote)
American Airlines (Old)	1	2	-
American Airlines (New)	1	2	-
Braniff International Airways	1	1	-
Northeast Airlines (1st phase)	1	1	Variable
National Airlines (1st phase)	1	2	Variable
Western Air Lines	1	2	Variable
Trans World Airlines, New York City	1	1	-
Trans World Airlines, Chicago	1	1	-
Trans World Airlines, Los Angeles	1	1	-
New York, New Haven and Hartford Railroad	1	Variable	1
Santa Fe Railroad	-	Variable	4
New York Central System (New York)	1	Variable	-
New York Central System (Chicago)	1	Variable	-
A major airline, contract pending	1	Variable	Variable
National Airlines (2nd phase)	1	Variable	14

Many of the reserivisor systems utilize inter-city and intra-city wire transmission of input and output. All of the reserivisor systems use a special transceiver to serialize and check the data.

The following systems utilize special transceivers, which permits the use of several input/output devices on a single line.

American Airlines (New)
 Northeast Airlines (1st phase)
 National Airlines (1st phase)
 Western Air Lines
 Trans World Airlines, New York City
 Trans World Airlines, Chicago

Trans World Airlines, Los Angeles
 New York, New Haven and Hartford Railroad
 Santa Fe Railroad
 New York Central System
 A major airline, contract pending
 National Airlines (2nd phase)



Picture by American Airlines, Incorporated

The following systems have the ability to control the operation of the data processor not in the immediate system, when permitted, and except for National Airlines (2nd phase) the ability to time-share jointly used communication lines and channels: (The systems have connection with and may exercise control over two or three other systems, when permitted)

New York, New Haven and Hartford Railroad
 Santa Fe Railroad
 New York Central System

A major airline, contract pending
 National Airlines (2nd phase)

STORAGE

Relays are used for immediate or temporary storage for all reservisor systems.

Central data storage is by magnetic drum. The number of drums, the number of megabits stored/drum and the number of binary digits used for a standard item stored, comparable to a "word" in general purpose systems, is given below:

System	Number of Magnetic Drums	Megabits/Drum	Bits/Word
American Airlines (Old)	2	0.25	7
American Airlines (New)	2	1	8
Braniff International Airways	1	1	10
Northeast Airlines (1st phase)	2	0.25	7
National Airlines (1st phase)	1	1.25	7
Western Air Lines	1	1.25	10
Trans World Airlines, New York City	1	1.25	10
Trans World Airlines, Chicago	1	1.25	10
Trans World Airlines, Los Angeles	1	1.25	10
New York, New Haven and Hartford RR	1	3.50	10
Santa Fe Railroad	1	3.50	16



Picture by American Airlines, Incorporated

New York Central System	2	3.50	16
A major airline, contract pending	1	1.25	10
National Airlines (2nd phase)	1	1.25	10

Random access techniques are used for magnetic drum stored information.

INPUT / OUTPUT

The input/output keyboard devices, shown in the pictures above (See "Additional Features and Remarks" for captions to pictures) are scattered over wide areas. The following table shows the number of input/output devices located at or near the data processor, the number of input/output devices located in the same city but not at the data processing unit, the number in cities other than the city in which the data processor is located, and the number of input/output devices with the printing mechanism.

System	Devices Located at Data Processor	Devices Located in Same City, not at Data Processor	Devices Located in Cities Other than D-P Cities	Number of Other Cities Connected to System	Devices with Printing Mechanism
American Airlines (Old)	92	24	5	2	-
American Airlines (New)	128	28	5	2	-
Braniff International Airways	-	2	-	51	1
Northeast Airlines (1st phase)	16	6	13	2	-
National Airlines (1st phase)	15	7	111	7	-
Western Air Lines	20	9	44	13	-
Trans World Airlines, New York City	77	34	5	2	-
Trans World Airlines, Chicago	31	7	2	2	-
Trans World Airlines, Los Angeles	41	15	30	2	-
New York, New Haven and Hartford RR	6	1	14	4	21
Santa Fe Railroad	-	9	4	4	13

New York Central System (New York)	8	18	17	16	38
New York Central System (Chicago)	16	1	64	20	81
A major airline, contract pending	25	6	-	9	-
National Airlines (2nd phase)	40	12	100	14	-

Other standard input/output media are utilized by various reservisor systems.

The following systems utilize paper tape:

National Airlines (1st phase)	New York, New Haven and Hartford Railroad
Western Air Lines	Santa Fe Railroad
Trans World Airlines, New York City	New York Central System
Trans World Airlines, Chicago	A major airline, contract pending
Trans World Airlines, Los Angeles	National Airlines (2nd phase)

The following systems utilize teletype message and wire transmitted direct and dated transaction messages:

Braniff International Airways	Western Air Lines
Northeast Airlines (1st phase)	A major airline, contract pending
National Airlines (1st phase)	National Airlines (2nd phase)

CHECKING FEATURES

Input error or data rejection is immediately signalled to the originating input device.

Automatic checking and data verification controls are built into the system

PRODUCTION RECORD

System	Status
American Airlines (Old)	Replaced
American Airlines (New)	Installed and in use
Braniff International Airways	Designed and under construction
Northeast Airlines (1st phase)	Manufacture completed, waiting delivery
National Airlines (1st phase)	Designed and under construction
Western Air Lines	Designed and under construction
Trans World Airlines, New York City	Designed and under construction
Trans World Airlines, Chicago	Designed and under construction
Trans World Airlines, Los Angeles	Designed and under construction
New York, New Haven and Hartford Railroad	Designed and under construction
Santa Fe Railroad	Designed and under construction
New York Central System	Designed and under construction
A major airline, contract pending	Designed
National Airlines (2nd phase)	Designed

The American Airlines (Old) system was replaced in August 1956.

The Northeast Airlines (1st phase) system will be replaced during 1959.

RELIABILITY AND OPERATING EXPERIENCE

Systems in operation at the present time are in use approximately 22 hours/day on an on-line basis. All of the reservisor systems are in use 7 days/week. The American Airlines original system has been in use over 50 months. The American Airlines new system has been in operation over 5-1/2 months. The up-time on the original system was 99.8% over the four year period preceding its replacement by a larger system.

Western Air Lines
Los Angeles, California

Trans World Airlines
New York City

Trans World Airlines
Chicago, Illinois

Trans World Airlines
Los Angeles, California

New York, New Haven and Hartford Railroad
New York City

Santa Fe Railroad
Chicago, Illinois

New York Central System
New York City

New York Central System
Chicago, Illinois

A major airline, contract pending

National Airlines (2nd phase)
Miami, Florida

INSTALLATIONS

The following systems are installed or pending installation:

American Airlines (Old)

B. F. Goodrich Footwear Division
Watertown, Massachusetts

Braniff International Airways
Dallas, Texas

Northeast Airlines (1st phase)
New York City

National Airlines (1st phase)
Miami, Florida

Special purpose systems of this type require manufacturer-customer negotiation.

Systems are installed and maintained as a service to the user on a term basis or monthly service basis only.

ADDITIONAL FEATURES AND REMARKS

All reservisor systems are special purpose computing and data processing systems.

The systems operate on-line with updating features.

The data processor is controlled from all input transactions recording locations.

The systems uses "tailored" functional input/output devices for transaction completion.

Visual verification of input/output data (response) from the originating input point, is possible.

Systems incorporate remote control of the data processor from input/output stations.

The pictures are of the American Airlines original reservisor.

The first picture shows the storage unit.

Electronically recorded on the magnetic oxide surface of these two rotating drums is the inventory of seats on American Airlines flights over a ten day period as well as the newly added flight information on arrivals and departures at New York airports for the day. These drums, installed in a room in American's hangars at LaGuardia, whirl at the rate of 1,200 revolutions per minute. The machine is in operation 22 hours a day, with two hours out in the dead of night for maintenance work.

The second picture shows the electronic unit for the control and processing of reservation data.

The third picture shows an agents set. Sets such as this--127 of them--in American Airlines' Reservation office at LaGuardia Airport and in ticket offices throughout the New York metropolitan area are now used not only to make passenger reservations but to give up-to-the-minute information on the arrival and departure of flights. The plate inserted in the top of the machine is the key to the proper spot on a whirling magnetic drum on the surface of which the data is recorded electronically. Manipulation of the buttons and keys on the set then enables the agent to determine space available on a flight, make or cancel reservations, and to query the machine as to the operation of any particular flight.

The fourth picture shows a master agent set used in American Airlines' Flight Dispatch office at LaGuardia Airport in conjunction with an agent set which enables an operator to record electronically in the Magnetronic Reservisor data on the operation of flights.

The fifth picture shows both the regular agent set and a master agent set.

MAGNETRONIC SAVINGS ACCOUNTING

MSA Magnetronic Savings Accounting System

The Teleregister Corporation
Subsidiary of the Ogden Corporation

APPLICATIONS

Automatic processing of savings accounts and mortgages.

NUMERICAL SYSTEM

Internal number system Binary and binary coded decimal

ARITHMETIC UNIT

Time required for complete transaction	0.4 seconds
Addition time required for a complete transaction, in which teletype lines are used to transmit input/output data	2.5 seconds
Designed maximum capacity, transactions/hour	4,500,000

System will perform basic operations other than addition, subtraction and multiplication.

Two master positions control the system.

Timing	Synchronous and asynchronous
Operation	Concurrent

STORAGE

Number of "single-function" magnetic drums	3
Number of "multiple function" magnetic drums	1

Random access techniques are used on magnetic drum stored data.

Automatic sorting, merging and organizing of data are performed by the magnetic drum units.

Duplicate basic records are maintained on magnetic tapes by transferring information from the drums.

Magnetic tapes are used as part of the basic central storage unit.

Immediate and temporary storage media include:
Magnetic core
Gas tube
Trigger circuits
Relays

CHECKING FEATURES

Visual verification of input/output data (response) at the input point.

Input error or data rejection is immediately signaled to the originating input device.

Automatic checking and data verification controls are built-in to the system.

Data to and from remote locations are checked by the serializing transceivers.

INPUT / OUTPUT

The input/output keyboard devices are scattered over wide areas. The following table shows the number of input/output devices located at or near the data processor, the number of input/output devices located in the same city, but not at the data processing unit, the number in other cities, and the number located at the printing mechanism.

System	Input/Output Devices:		Quantities and Location		
	Devices Located at Data Processor	Devices Located in Same City, not at Data Processor	Devices Located in other Cities	Other Cities Connected to System	Devices Located at the Printing Mechanism
Howard Savings Inst.	15	3	9	4	27
Union Dime Savings Bank	16	5	-	1	21
Society for Savings	8	6	5	2	19

Other input/output media utilized with this system:

Punched paper tapes

Magnetic tapes

Electric office machines and equipment controlled or directly driven by the system

Standard punched cards

Special transceivers are utilized to serialize and check the data to and from remote locations and to permit multiplexing of input/output devices on a single line.

PRODUCTION RECORD

In production 3
On order 3

These systems are in advanced stages of design and development.

COST, PRICE AND RENTAL RATE

Price is based on negotiation between manufacturer and customer, and is dependent upon customer requirements.

System is installed and maintained on a service contract basis.

RELIABILITY AND OPERATING EXPERIENCE

Contemplated usage "on-line"	6 to 9 hours/day
Contemplated usage "off-line"	8 hours/day
Contemplated usage "days/week"	5

INSTALLATIONS

Howard Savings Institution
Newark, New Jersey

Union Dime Savings Bank
New York City

Society for Savings
Hartford, Connecticut

ADDITIONAL FEATURES AND REMARKS

Special purpose systems

On-line operation with current up-dating features

Combined on-line and off-line operating features

General purpose features are included and utilized on an off-line basis.

Data processor control is possible from all input transactions recording locations.

Utilizes "tailored" functional input/output devices for transaction completion.