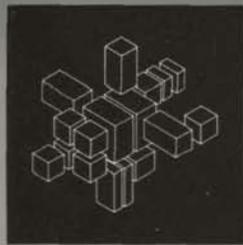


RCA 3301 Realcom
**Systems Central
Data Operations
For
Advanced
Management**

RCA 3301 Realcom
Systems Central



REAL-TIME EVENT-RESPONSIVE PROCESSING...FOR 'RIGHT-TIME' ACTION

DATA COMMUNICATIONS INTEGRATED TOTAL OPERATIONS...LOCAL AND REMOTE

MASS RANDOM ACCESS CENTRAL INFORMATION FILES...INSTANT FACTS AS NEEDED

VIDEO DISPLAY EXTENDING 'COMMAND AND CONTROL' TECHNIQUES TO BUSINESS

HARDWARE-SOFTWARE MODULARITY EASY SYSTEM REORIENTATION FOR CHANGING NEEDS

ALL-PURPOSE SYSTEM BUSINESS...SCIENTIFIC...EVERY PRACTICAL INPUT/OUTPUT



RCA 3301 Realcom
Systems Central



This year business and government administration can advance a generation. The evolution is ushered in by the RCA 3301 Realcom—the all-purpose computer system that derives its name from the real-time and communications dimensions it adds to conventional business data processing and scientific computation at the user's option.

Crystallizing RCA advances in information technology from many fields, Realcom can be used as a fully automatic Systems Central—a self-contained, time-and-space spanning multi-function network. It opens a new way of running a business or government agency mission... completely on-line... integrating total data operations and management information. In effect, the Realcom Systems Central extends "command and control" to business administration.

The business manager now spending \$8,000 a month—or many times more—just for data processing or special purpose computers is invited to reassess current operations and procedures for the total solution offered by the Realcom Systems Central... and for its workpower wherever there's money to be made or saved.

Required tasks can be pre-timed to confirm the best cost/performance index achieved by any computer system now in use or announced for the future.

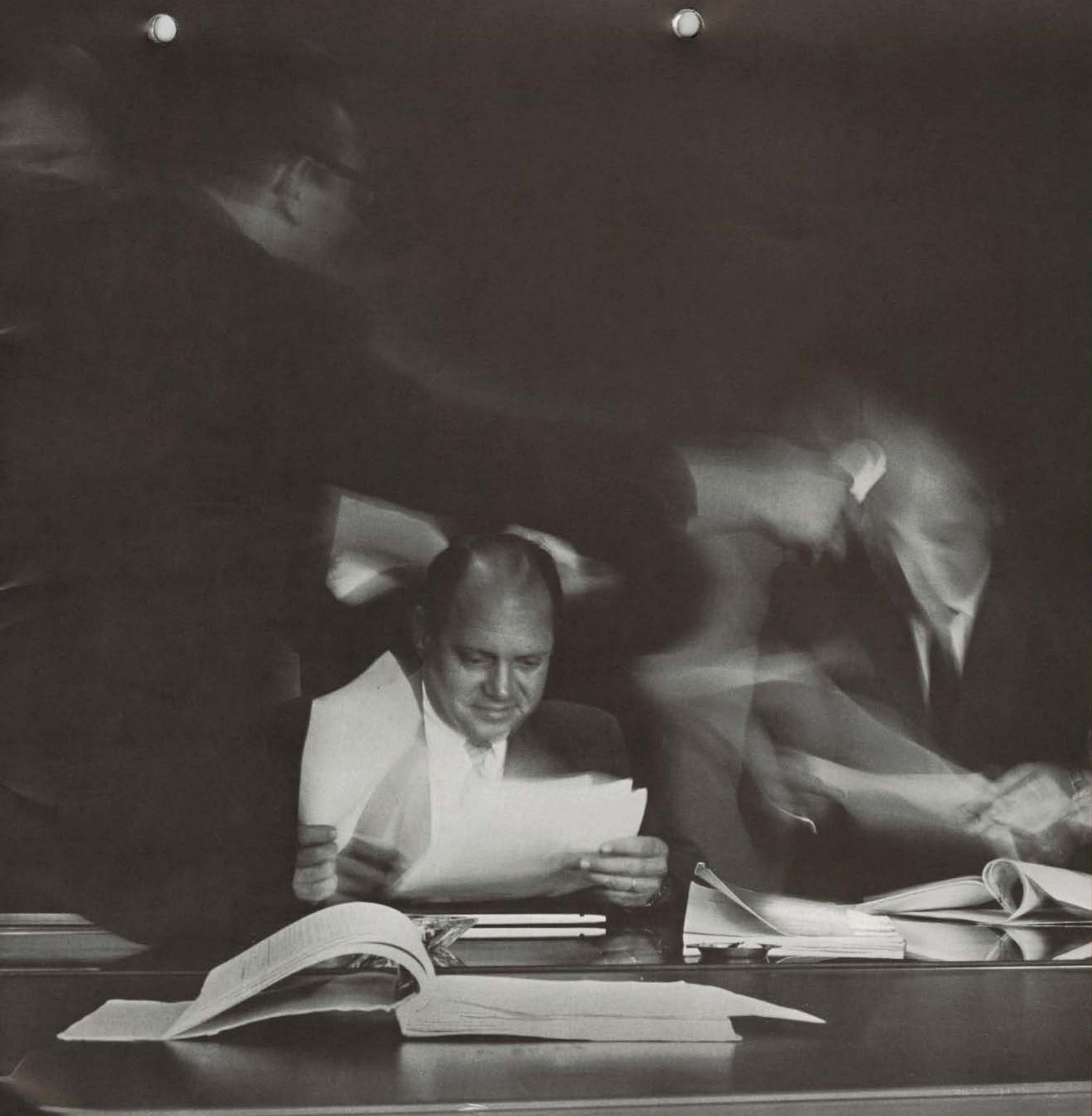
Summed up... starting today management can expand its horizons to EDP concepts never before possible or economically feasible, for—

Basing business planning and decisions on all the vital facts.

Improving customer service, thereby setting the climate for more business.

Scientifically evaluating alternative courses of action.

Raising the objectives of over-all corporate achievement.



RCA 3301 Realcom
Systems Central



The Realcom Systems Central combines advanced equipment and techniques for maximum data utilization throughout a corporation or government agency. In effect, it permits central data operations to be "plugged in"...automatically...under computer control... to the source of the information...or to local and remote points where it is to be used...or to new functions and services that may be added. This dynamic scope is achieved through:

All the Elements for Total Operations.

- 1. One of the most powerful and versatile processors now being delivered to users...at lower cost than many lesser, single purpose computers.**
- 2. A new mass random access memory...unrivalled in economy and capacity.**
- 3. The most comprehensive practical data communications...computer to computer...computer to people...computer to remote video displays, teleprinters and data gathering input stations.**
- 4. An outstanding array of advanced peripherals, buffered where necessary.**

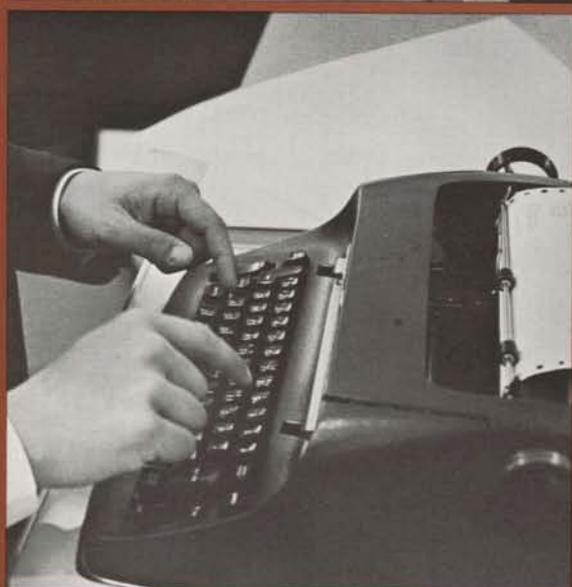
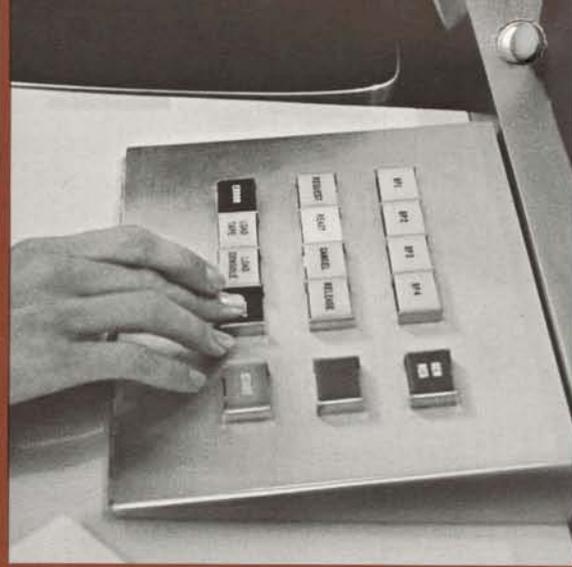
Efficiency on a "Mix" of Tasks. Realcom is designed for full-time throughput through time-sharing of its large and very fast, expandable main memory...implemented by a nanosecond-range scratch-pad Micro-Magnetic Memory for a priority interrupt system. There's also an optional fast-access magnetic drum external auxiliary storage.

Conversion in Orderly, Easily Managed Steps. Five multiple magnetic tape systems permit the new user to begin with job-tailored, efficient batch processing. They provide physical and data compatibility with most other computers now in use...industry-wide...easing conversion and conserving investment in existing tape files.

Long-Range Computer Solution. For growth and new functions, Realcom provides open-ended expansibility up to levels that few business or government agencies will exceed. Modular random access memory capacity ranging up to 5.45 billion characters is one example. Unique *functional modularity* permits basic system re-orientation without interfering with existing operations.

Balanced for Productivity. The user can fully exploit Realcom's ability to perform a large number of tasks at the same time. There's not only an outstanding choice of options. They're also balanced to work together without compromise of efficiency or performance. Or, for a manifold increase in sheer compute-power and for concurrent processing of a diversity of tasks, a Systems Central can comprise chains or loops of main and satellite computers, interconnected memory-to-memory.

Convenience in Use. Realcom's diversified capabilities are implemented by advanced software based on logical system structuring and problem solution...yet easily modified for the user's special requirements. Initially, Realcom's comprehensive software minimizes conversion problems. Later, it aids expansion in scope without outmoding existing programs.



RCA 3301 Realcom
Systems Central

**6 FEATURES FOR
SYSTEMS
CENTRAL
VERSATILITY
AT WORK**

1 Responsive to Job Priority Demands

A flexible priority interrupt system provides automatic control of the Realcom's real-time capability. The computer can respond in millionths of a second to the priority demand of a job or service different from those operations that it is running. In conjunction with programming, the interrupt system also facilitates:

- Error recovery procedures.
- Communications service demands.
- Simultaneous operation of multiple input/output devices.

When an interrupt occurs, the status of the running programs in the main memory is flashed into the scratch-pad Micro-Magnetic Memory, and the "green light" given to the superseding higher-priority operation. After the latter is completed, the interrupted programs are resumed where they left off. The order of priority service is pre-assigned by function, and safeguarded by controls.

2 Performs Up to 5 Operations Simultaneously

A practical and easy-to-use system of multi-level simultaneity is featured in the 3301 Realcom. Simultaneity in the 3301 is based on time-sharing.

- Operations are under complete control via the interrupt system.
- Use is simplified by unique RCA software.

Standard in the 3301 Realcom are separate normal mode, for computing, and two simultaneous modes for operation of input/output and storage devices. Optional are an independently simultaneous mode for communications and a third simultaneous input/output mode for data transfer with magnetic storage devices.

In addition, high-speed printing and card punching require negligible computer time, just the split second to load the buffers, after which they are executed independently.

3 Compatibility—With the 301—and Industry-Wide

Use of satellite systems with the 3301 Realcom, or conversion from older systems are facilitated by its two types of compatibility, one inherent, with the 301...the other by magnetic tape communications.

■ **There's no conversion problem** for a 301 user expanding to a Realcom. As the 3301 Realcom accepts and runs 301 programs, it automatically makes its own internal adjustments to take advantage of its superior performance. Further RCA compatibility results through shared use of the same stored data via common magnetic tape stations between the 3301 and the RCA 501 or 601 systems.

■ **Two new industry-compatible magnetic tape systems** accept data, tapes and reels of tape drives used with most non-RCA computer installations. Thus the 3301 Realcom can economically replace many older computers, using their existing tape files.

4 Communicates with Local and Remote Operating Points

Compute power of the 3301 Realcom may be extended to local and remote operating points via public dial network and leased lines for simultaneous communication with the processor. Multiple on-line locations may share the connecting communications lines.

■ **Positive control** of message traffic and simplified programming are features with the priority interrupt system.

■ **"Off-the-shelf"** communications, telegraph, and polling buffers and standard interface units are available to service a variety of remote input/output devices, supplied by RCA or common carriers.

The Realcom permits powerful centralized data management as an adjunct to other services, since communications are handled with independent simultaneity, and require only a small fraction of system time. Scope of a Systems Central is further extended by high-speed memory-to-memory, local and remote computer hook-ups.

5 Language Controlled for Ease of Use

Most operations of the 3301 Realcom can be performed merely by the operator's touching a button on the console and typing a brief command message on the console input/output typewriter.

■ This device, with a real-time priority interrupt, gives the operator direct communication with the processor for the automatic sequencing, control and execution of desired operations by software without further intervention.

■ At the same time, hard copy documentation of the operator's action is produced.

Practically, therefore, operations of the 3301 Realcom are controlled by software, including the numerous problem-oriented languages available.

6 New Scope and Concepts in Software

The extensive programming and operating systems designed for the 3301 Realcom in its many configurations approach the ideal. There are:

● A symbolic assembly system, through which the computer does the programming clerical work.

■ COBOL and Fortran II and IV problem-oriented language systems.

● An executive system to direct and synchronize computer operation traffic.

■ A file control processor to automate input/output.

■ A broad range of utility programs including an advanced "oscillating" sort-merge fully exploiting the number of tape stations used.

This specially developed software complement helps the user gain utmost productivity from the 3301 Realcom. It minimizes conversion problems, facilitating quick writing of 3301 Realcom programs from flow charts of applications even if at a level close to the old machine language. At the same time, it provides updated documentation.

In addition, the 3301 can use the unrivalled software complement available for the RCA 301. These double-edged programming tools offer a powerful assist to the prospective 3301 Realcom user, whether turning to EDP for the first time or converting from a lesser computer.

RCA 3301 Realcom
Systems Central

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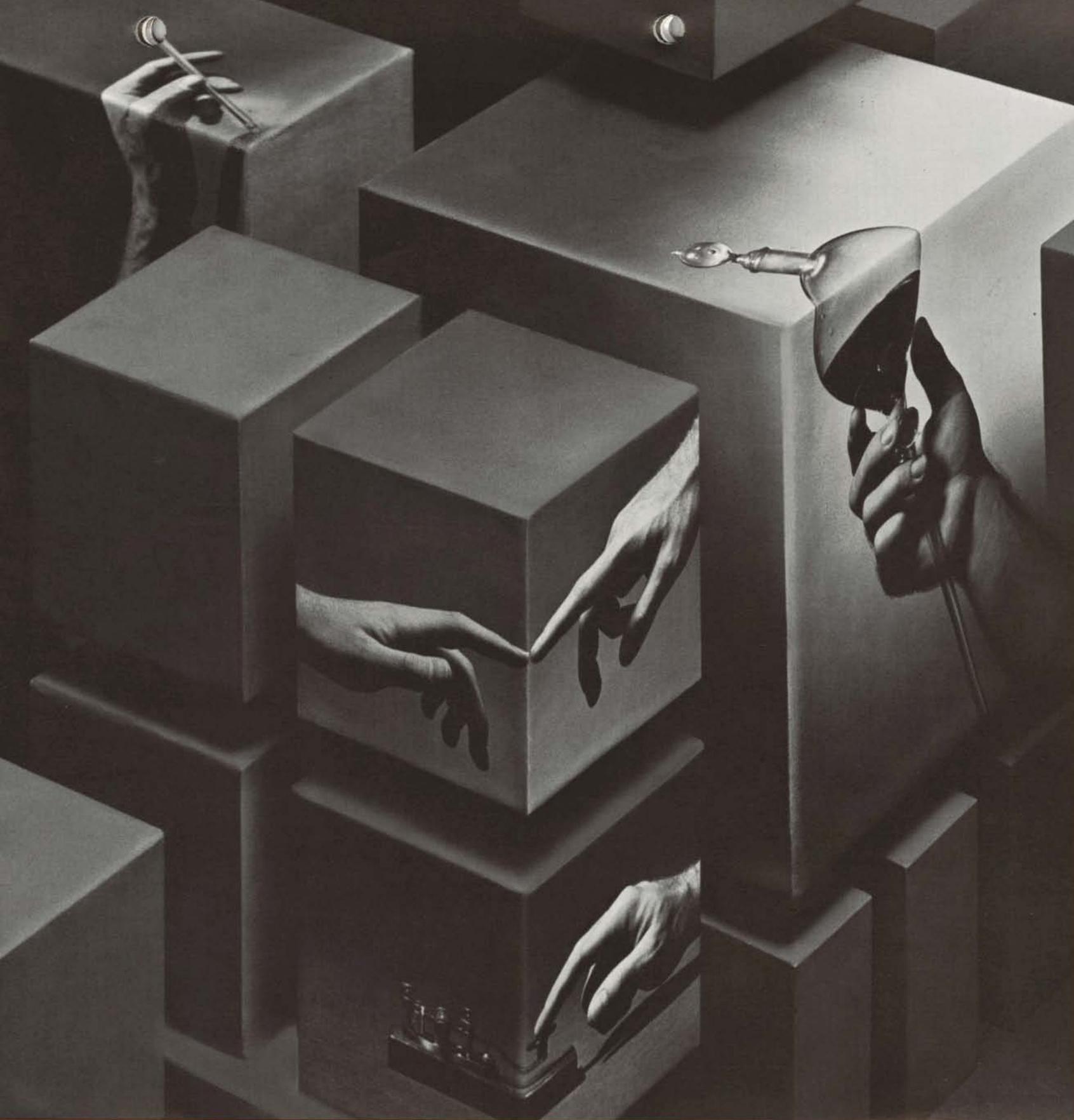
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ALL-PURPOSE
ADAPTABILITY...
FOR TOTAL
CORPORATE
COMPUTER NEEDS

1. A Super-Fast Business Data Processor. Inherent in the Realcom are low equipment costs, fast internal speeds, extensive growth potential, ease of conversion, relative simplicity in use, and comprehensive software and technical support. Notable is the balance between operational

features and application requirements:

- *Efficient serial processing* with magnetic tape storage in five speed ranges and ample capacity for very large master files.
- *Large volume, fast random access.* The 3488 mass memory and drum storage units can be teamed to speed the processing of transactions as they occur...locating any record with one access in each...eliminating conventional chaining.
- *Ample memory for maximum throughput.*
- *Fast, multiple input/output* for virtually any required function, volume, or range of jobs.
- *Highly reliable accuracy controls.* Facilitating error detection, each character is analyzed for validity at every data transfer and manipulation...every arithmetic step is tested.

2. A Powerful Scientific System. Mathematics for management science, optimization of variable conditions and operations, and calculations for engineering and research can be accommodated two ways:

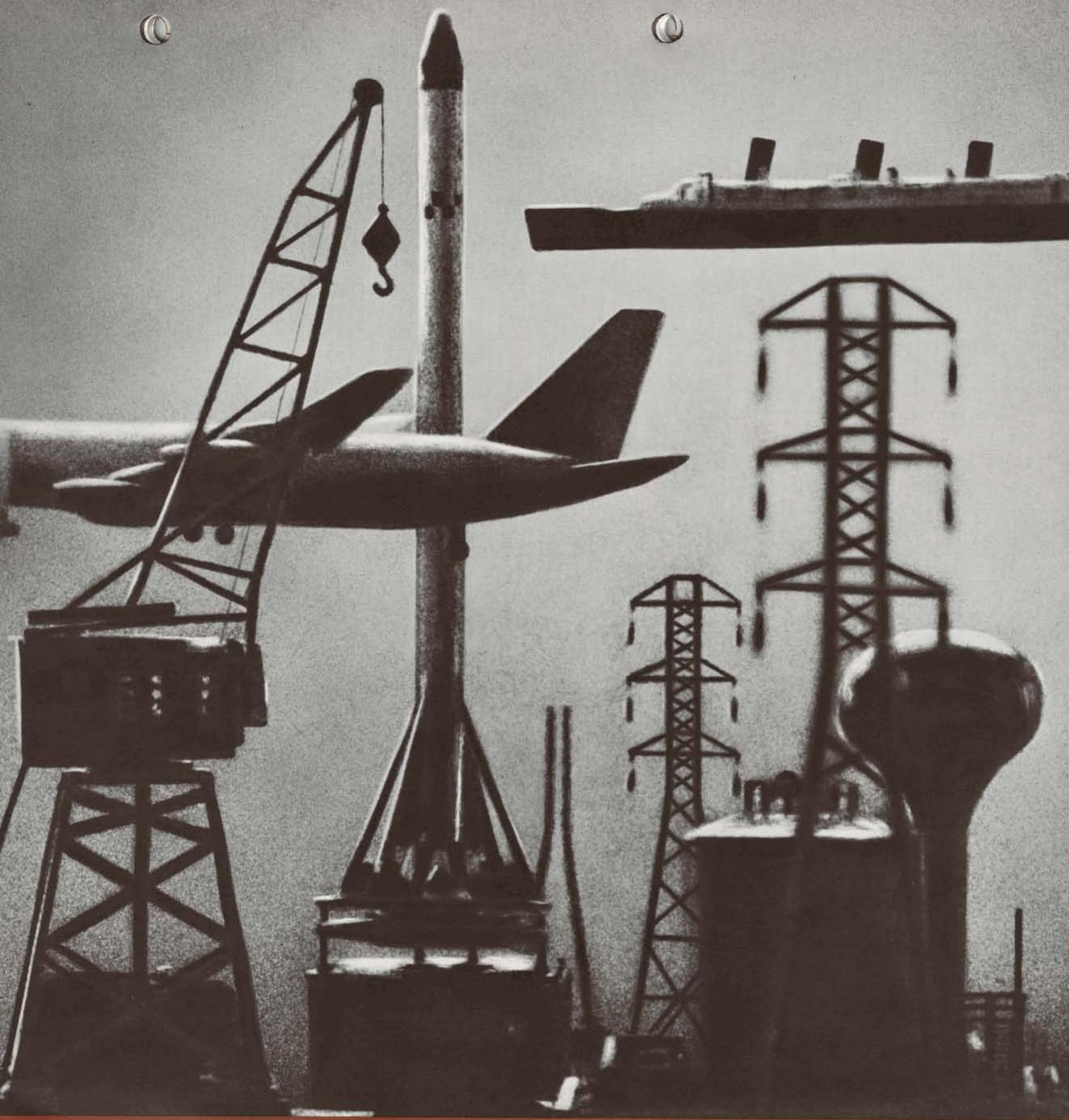
- *Standard fast arithmetic.* Capability is on the order of over 24,400 additions or subtractions, 1,500 multiplications or 600 divisions per second for eight-digit numbers.
- *Optional high-speed arithmetic unit.* Professional users will approve its parallel fixed and floating point arithmetics, large exponent range, a manipulable accumulator-PR register, and enhanced set of high-speed arithmetic instructions. An extensive library of interpreters, simulators, "compile and go" Fortran II and IV, and many basic scientific routines let technical people solve their problems with minimum formal computer training...and open the use of a wealth of applications programmed for other computers.

3. A Communications Processor for Two-Way Data Flow.

Linking local and remote operations, the 3301 brings to bear its diversity of talents wherever needed. Within its sphere are store and forward message switching, message in-transit editing and priority transmissions...which previously required special-purpose intermediate input/output devices, terminal equipment or computers. Among numerous features are:

- *Services all commonly used data transmission media*...with dual scanning rates for faster facilities.
- *Automatic control* of communications priority processing and resumption of the interrupted standard program by the 3301 Operating System.
- *Transfer speeds* dependent on the quality of the carrier.

4. The Ultimate...Real-Time, On-Line System. For on-line, right-time management control, Realcom combines communications and mass random access processing capabilities. In this category are two-way management information systems, sourcing "live" production information as an operation is performed, remote inquiry servicing and processing, and centralized processing of operations for field locations. By adding the high-speed arithmetic unit...within the dictates of the economics of so powerful a system...closed-loop process control, data acquisition and reduction, and command and control applications may be effectively handled. The criterion is "right-time" availability of data...for applications previously considered beyond the scope of practical business systems. Let's look at a composite real-time system in use.



REAL-TIME DATA
UTILIZATION...
WHEN AND
WHERE NEEDED

A typical real-time information system at work illustrates the total approach to business management. It combines the efficiency of bulk data processing...of cyclical operations...with random inquiry...or with split-second exception reports on current status. It permits combinations of fully random and batch processing...to exactly the extent required. It minimizes the need for passing an entire master file. It can encompass every one of the user's local and remote corporate locations.

Based on Mass Random Access Plus Communications. The marriage of mass random access and communications in the Realcom Systems Central creates this new capability for management. Business facts come alive for all who need to know...wherever they are located...whenever the need arises. Computer operations once unthinkable economically are made practical by the massive low-cost capacity of RCA's Model 3488 random access computer equipment.

How Large a Capacity Does the 3488 Offer for Your Files?

- Over 340 million characters...equivalent to 20 magnetic tape reels.
- Multiples of 340 million...up to 5.45 billion characters.

There's practically no limit. Removable magazines are easily interchangeable among 3488 random access units. They provide virtually infinite capacity in vault storage...quick availability for active processing or master file back-up.

Fraction of a Second Replies to Inquiries. With this massive, low-cost storage, business operations gain a new order of timeliness. Imagine being able to handle customer inquiries practically as fast as they come in...or reply to a sales office's inventory status inquiry for a specific item...concurrent with processing of daily routine business.

...Or automatically drawing a credit check on a customer almost as soon as his order is received...in one computer pass for sales order fulfillment, inventory control, and customer accounting.

...Or, providing complete cost accounting information concurrent with logistics or personnel management for a military agency.

'Live' Data for Management. Consider the value of instantly apprising responsible management levels of exceptions or variances in their administrative and operational activities. Some examples?

- Pinpointing schedule slippage or costs or performance variances to department heads as job status data and manpower and machine loading reports are inputted via RCA EDGE remote data gathering stations.

At top management levels, there's total information instantly on hand for planning and decision. Think of facts you can't get now until days or weeks later, or closing the books at month end:

- Reports on all operations, as current as desired.
- Corollary information that normally would not be processed...such as detailed or alternate vendor information in inventory control...or demographic data for market planning.

Tested and Proved Techniques. The techniques of "command and control" business administration draw on RCA's experience-in-depth in complex military real-time/communications systems. The equipment employed in Realcom Systems Central, however, is business oriented...off-the-shelf items...performing practical, rather than far-out functions...sensibly priced...implemented by special software for ease of use...adaptable to the user's present procedures and systems without revolutionary changes.



RCA

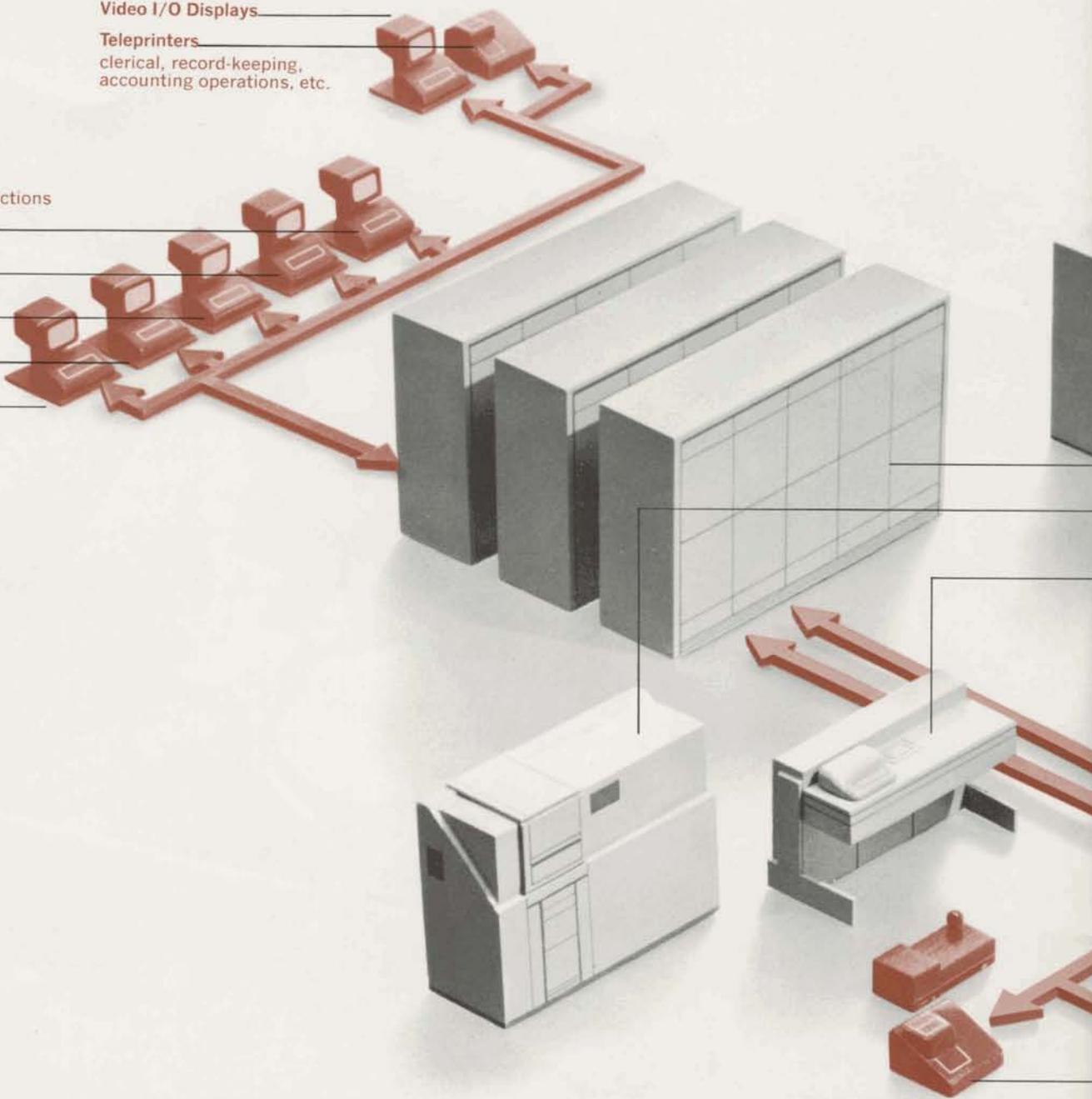
**COMPOSITE
'COMMAND AND
CONTROL'
BUSINESS
SYSTEM**

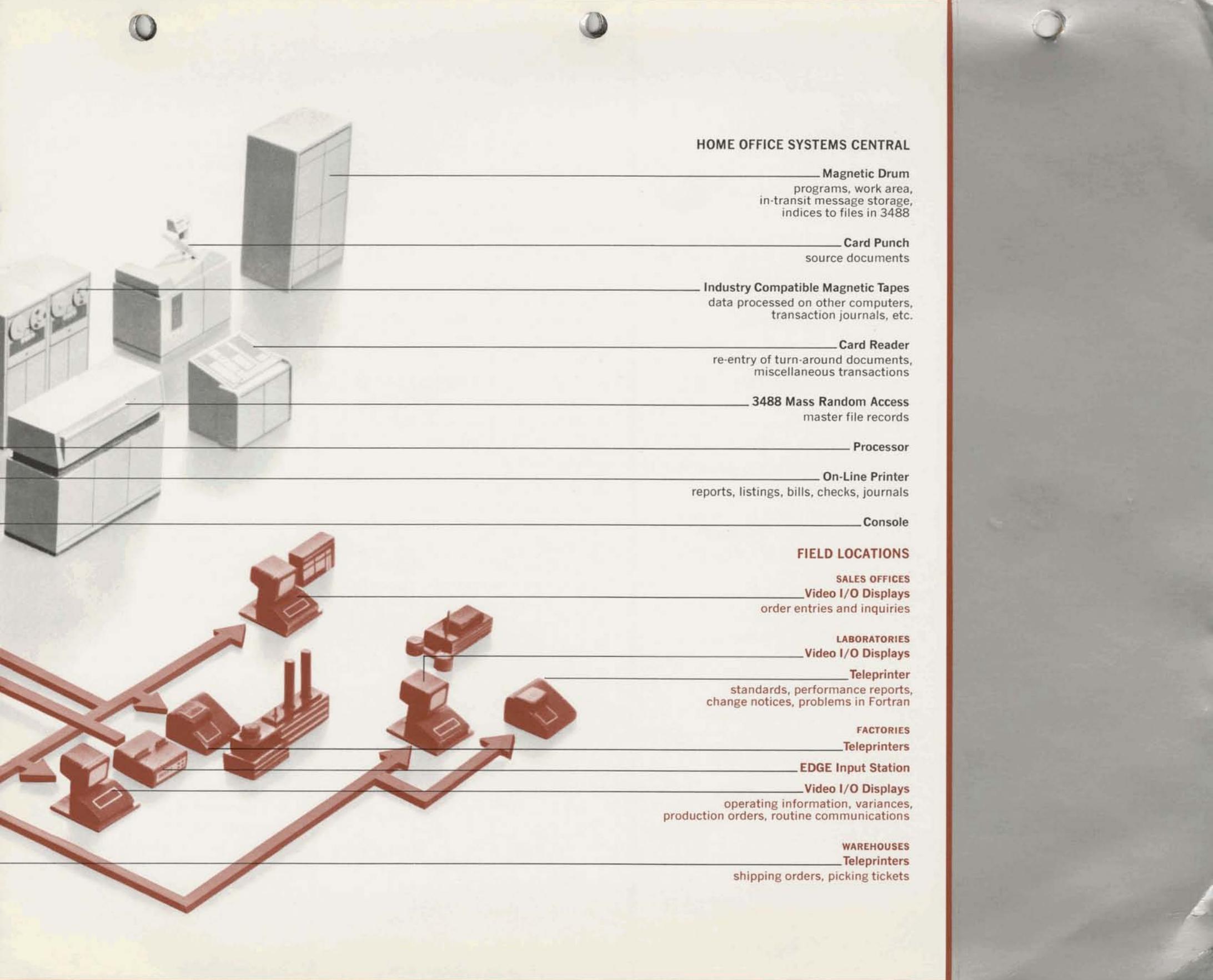
ADMINISTRATIVE AND SERVICE DEPARTMENTS

Video I/O Displays
Teleprinters
clerical, record-keeping,
accounting operations, etc.

EXECUTIVE OFFICES

Video I/O Displays
summary reports, exceptions, actions
VICE PRESIDENT, MANUFACTURING
VICE PRESIDENT, MARKETING
EXECUTIVE VICE PRESIDENT
PRESIDENT
CONTROLLER





HOME OFFICE SYSTEMS CENTRAL

Magnetic Drum
programs, work area,
in-transit message storage,
indices to files in 3488

Card Punch
source documents

Industry Compatible Magnetic Tapes
data processed on other computers,
transaction journals, etc.

Card Reader
re-entry of turn-around documents,
miscellaneous transactions

3488 Mass Random Access
master file records

Processor

On-Line Printer
reports, listings, bills, checks, journals

Console

FIELD LOCATIONS

SALES OFFICES
Video I/O Displays
order entries and inquiries

LABORATORIES
Video I/O Displays
Teleprinter
standards, performance reports,
change notices, problems in Fortran

FACTORIES
Teleprinters

EDGE Input Station
Video I/O Displays
operating information, variances,
production orders, routine communications

WAREHOUSES
Teleprinters
shipping orders, picking tickets

SOME FACTS AND FIGURES

PROCESSOR

Memory: 40,000 to 160,000 characters in increments of 20,000.

Cycle time: 1.5 microseconds (access-regenerate) cycle.

Micro-Magnetic Memory: 50 four-character locations, symbol addressed; 214 nanoseconds split cycle.

Features: character addressing, variable data fields, priority interrupt, decade-oriented.

Instructions: two-address, 10-character; 301 set plus eight-digit fixed multiply/divide, decade transfer, transfer to edit field, I/O control; 3 index registers for automatic address modification.

Console typewriter: input/output; 924 characters per minute.

Digital Clock: (optional) time source for control of data logging and handling; 24 hours by units and tens of hours, minutes, and seconds.

Add time: (standard)
variable operand size
5-digit $A+B \rightarrow A$ 27.43 μ secs.
(optional scientific unit)
8-digit fixed point operands
 $A+Acc \rightarrow Acc$ 5.36 μ secs.
10-digit floating point operands
 $A+Acc \rightarrow Acc$ 8.95 μ secs.

Performance: transfer 10 characters
4.8 μ secs.
compare 10-character fields
36.21 μ secs. maximum
zero fill (10 characters)
16.8 μ secs.
conditional transfer of control
6.43 μ secs.
unconditional transfer 1.93 μ secs.

FILES

Magnetic Tape: maximum 24;
Model 581: 33,333 c.p.s. data transfer rate; echo check.

Model 582: 66,667 c.p.s.; automatic read-after-write parity check.

Model 681: 120,000 c.p.s.; automatic read-after-write parity check.

Model 3485: 30,000/83,400/120,000 c.p.s. (program selectable in industry-compatible or RCA modes); binary and BCD recording; block and character parity check; forward and reverse reading.

Model 3487: features as above, but 15,000/41,700/60,000 c.p.s. data transfer rates.

Random Access:

Model 3488: 340 million to 5.45 billion alphanumeric characters, in increments of 340 million; 80,000 c.p.s. transfer rate. Employs 16 x 4½ inch magnetic storage cards in removable magazines. Powered card selection, read-after-write parity check.

Model 3465: magnetic drum and adapter, 150,000 c.p.s. transfer rate; 8.6 milliseconds average access time; 6 capacities: 327,680 to 2,621,440 characters. Longitudinal accuracy control; read/write address verify.

INPUT/OUTPUT

Buffered Printer: two maximum, 120 or 160 columns, 1,000 lines per minute.

Buffered Card Punch: two maximum, 300 cards per minute, 80 or 51 column.

Card Reader: two maximum, 900/1,470 cards per minute, 80 or 51 column.

Paper Tape Reader: two maximum, 1,000 characters per second, 5, 6, 7 or 8 level.

Paper Tape Reader-Punch: two maximum, 100 c.p.s., 5, 6, 7 or 8 level.

Paper Tape Punch: two maximum, 100 c.p.s., 5, 6, 7 or 8 level.

Communications Mode Control: 160 lines maximum in increments of 20; scan rate (plugboard set) one memory cycle out of 6, 10, or 20.

Data Exchange Control: two maximum; each may connect with one DXC in another 3301 or a 301 at same location for memory-to-memory communications.

Communications Control: voice grade communications lines; uses common carrier digital subsets; connects with CC in remote 3301 or 301, or with RCA Remote Terminals.

Video Data Terminal: keyboard and 480-character display input-output; 10, 105 or 180 characters per second; self-contained memory.

Video Data Interrogators: up to 8 on one line, serviced by Interrogator Control Terminal; 180 characters per sec. Two options: 480-character display, 16 locally pre-stored formats; 320-character display, 12 pre-stored formats.

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**SOLVES
MANAGEMENT'S
TOTAL SYSTEM
NEEDS**

FOR OVERTAXED FIRST AND SECOND GENERATION COMPUTER INSTALLATIONS

FOR A COMPATIBLE STEP-UP IN PRODUCTIVITY FROM THE RCA 301

FOR ON-LINE, ON-TIME MANAGEMENT INFORMATION AND CUSTOMER SERVICE

FOR INTEGRATING CORPORATE COMMUNICATIONS AND DATA PROCESSING

FOR POWERFUL SCIENTIFIC COMPUTATION . . . ALONG WITH OTHER OPERATIONS

FOR CENTRALIZING PRESENTLY DECENTRALIZED OPERATIONS

RCA 3301 Realcom
Systems Central

For further information, phone
write a nearby RCA EDP Sales
Office:

- ATLANTA, Suite 1201, Georgia Power Bldg., 270 Peachtree St., 525-6547
- BOSTON, 886 Washington St., Dedham, MA 6-8350
- CHICAGO, Room 101A, Morton Salt Bldg., 110 N. Wacker Dr., ST 2-0700
- CINCINNATI, 407 Carew Tower, 441 Vine St., 241-1690
- CLEVELAND, 1600 Keith Bldg., 1621 Euclid Ave., CH 1-3450
- DALLAS, 7901 Carpenter Freeway, ME 1-3050
- DENVER, 2401 East Second Ave., 399-1460

- DETROIT, Southfield Office Plaza Bldg., 17000 West Eight Mile Rd., Southfield, 356-6150
- HARTFORD, 50 Lewis St., JA 7-4143
- HOUSTON, Room 1, Suite 410, Central Nat'l Bank Bldg., 2100 Travis St.
- KANSAS CITY, MO, 1125 Grand Ave., 421-7890
- LOS ANGELES, RCA Bldg., 6363 Sunset Blvd., HO 1-9171
- MIAMI, 95 Merrick Way, Coral Gables, 445-5487
- NEW YORK CITY (Downtown), 45 Wall St., MU 9-7200
- NEW YORK CITY (Uptown), 1250 Avenue of Americas, MU 9-7200

- PHILADELPHIA, SA 1909, 2 Penn Center Plaza, LO 8-8150
- PITTSBURGH, 222 Four Gateway Center, CO 1-1080
- RALEIGH, Room 422, First Federal Bldg., 833-2621
- SAN FRANCISCO, 343 Sansome St., YU 1-5600
- SEATTLE, 1111 Washington Bldg., 1325 Fourth Ave., MA 2-4234
- ST. LOUIS, 7710 Carondelet Ave., Clayton, PA 6-5322
- SYRACUSE, Room 302-303, State Tower Bldg., GR 4-5337
- TALLAHASSEE, Suite 207-208, Title Bldg., 219 South Calhoun St., 224-0034
- WASHINGTON, 1725 "K" St., N.W., FE 7-8500

RCA ELECTRONIC DATA PROCESSING
RCA-CHERRY HILL, CAMDEN 8, N. J.

 **The Most Trusted Name in Electronics**